Today's Prelims Topics

Integrated Air Defence Weapon System (IADWS)

Context

DRDO successfully conducts maiden flight-tests of Integrated Air Defence Weapon System (IADWS).

About IADWS

- A **multi-layered indigenous air defence system** designed to counter aerial threats using a combination of missile, laser, and command technologies.
- **Components of IADWS:**
    - **Quick Reaction Surface-to-Air Missiles (QRSAM)** – *(Developed by DRDO)*
        - Short-range system with a strike capability of **5–30 km**.
        - Mounted on a **mobile platform** for protection of moving armoured formations.
        - Provides **air defence while on the move**.
    - **Very Short-Range Air Defence System (VSHORADS)** – *(Developed by Research Centre Imarat – RCI)*
        - A **man-portable air defence system (MANPADS)**.
        - Targets **low-altitude aerial threats** at short distances.
    - **Directed Energy Weapon (Laser-DEW)** – *(Developed by Centre for High Energy Systems and Sciences)*
        - Uses a **high-power laser beam** to strike targets at the speed of light.
        - Can cut through enemy aircraft or missiles, and cause **structural failure** if the warhead is engaged.
    - **Command and Control Centre** – *(Developed by Defence Research & Development Laboratory – DRDL)*
        - Acts as the **central hub** for coordinating and integrating all weapon components.
        - DRDL functions as the **nodal agency** for the IADWS programme.

Source: Indian Express

X-Guard Fibre-Optic Towed Decoy (FOTD) system

Context

During **Operation Sindoor**, the Indian Air Force (IAF) is reported to have successfully deployed the **AI-enabled X-Guard Fibre-Optic Towed Decoy (FOTD)** system.

About X-Guard FOTD System

- It is a **towed electronic decoy** that trails behind the aircraft on a fibre-optic cable.
- It is **AI-enabled** and works in sync with the aircraft's **Electronic Warfare (EW) suite**.
- Designed and developed by **Israel's Rafael Advanced Defense Systems**.
- **Features:**
    - Effective at both **low and high altitudes**.
    - Functions across a wide speed range, from **subsonic to supersonic**.
    - Can be launched **before entering a high-threat zone** or **when a threat is detected**.
    - The system is **retractable in-flight**, ensuring reusability and operational flexibility.
    - Provides **continuous electrical and fibre-optic connectivity** throughout flight.
    - Creates a decoy signal to mislead hostile radars and protect the aircraft.

Source: The Hindu

Lunar Module Launch Vehicle (LMLV)

Context

ISRO is building LMLV which will be ready by 2035.

About LMLV

- **Key Features:**
  - An improved version of the **Next Generation Launch Vehicle (NGLV)**.
  - Height equivalent to a **40-storey building**.
  - Specifically designed for **lunar exploration**.
  - Targeted to support **India's first human mission to the Moon by 2040**.
  - Can carry up to **80 tonnes to Low Earth Orbit (LEO)**.
  - Can deliver about **27 tonnes directly to the Moon**.
  - **Propulsion**:
    - First two stages: **Liquid propellants**.
    - Third stage: **Cryogenic propellant**.

- **Cryogenic temperatures** generally mean **below –150°C (123 K)**.
  - At such temperatures, many gases (like oxygen, hydrogen, nitrogen) turn into **liquids**.
  - **Examples:**
    - **Liquid Hydrogen (LH_2)** – Fuel, stored at about –253°C.
    - **Liquid Oxygen (LOX)** – Oxidizer, stored at about –183°C.

ISRO's Key Launch Vehicles

- **PSLV (Polar Satellite Launch Vehicle):** A third-generation vehicle with liquid stages.
- **GSLV (Geosynchronous Satellite Launch Vehicle):** A three-stage, 4th-generation launcher.
- **SSLV (Small Satellite Launch Vehicle):** A compact, three-stage all-solid propulsion vehicle.
- **LVM3 (Launch Vehicle Mark-3):** Heavy-lift launcher with three stages.

Source: Indian Express

Jan Vishwas Bill (2025)

Context

The Jan Vishwas (Amendment of Provisions) Bill, 2025 introduced in Lok Sabha.

Key Features of the Jan Vishwas Bill, 2025

- Amends **16 Central Acts** across **10 ministries/departments**.
  - **Key acts include:** Motor Vehicles Act, 1988; Legal Metrology Act, 2009; Apprentices Act, 1961; New Delhi Municipal Council Act, 1994, among others.
- **Decriminalisation of Offences:** Converts several offences from **criminal to civil wrongs**.
  - **Example:** Under the Motor Vehicles Act, driving by an unfit person → now punishable with **monetary penalty only**.
- **Removal of Imprisonment Terms:** Imprisonment clauses for minor and procedural lapses removed.
  - **Example:** In Legal Metrology Act, wrong stamping of weights/measures → fine only, no imprisonment.
- **Revision of Fines and Penalties:** Provision for **automatic 10% increase in fines every 3 years** to maintain deterrence.
- **Adjudication of Penalties:** Appointment of **adjudicating officers** to conduct inquiries and impose penalties.
  - Establishment of **appellate authorities** for appeals against adjudication.
- **Municipal Taxation Reforms (NDMC Act, 1994):**
  - **Property Tax:**
    - Redefined to include **building tax and vacant land tax**.
    - Creation of a **Municipal Valuation Committee** to set base values and determine rates.
    - A **Hardship and Anomaly Committee** to resolve grievances.
  - **Stricter Punishments for Tax Evasion:** Wilful default, late filing, or false information in property tax returns punishable with **1 month to 7 years imprisonment** and **fine of at least 50% of tax evaded**.
  - **Advertisement Tax:** Provisions for levying advertisement tax have been **removed**.

Need for Such Bills

- **Over-criminalisation of Minor Offences:** India has **882 central laws**, of which **370 have criminal provisions** covering **7,305 offences** (Vidhi Centre study).
  - Many laws criminalise technical/procedural lapses unrelated to core criminal justice.
- **Arbitrary & Disproportionate Punishments:** Punishments for trivial acts like milking a cow on the street or not exercising a pet dog.
  - Violates principle of **proportionality** in crime and punishment.
- **Ease of Doing Business Barriers:** ORF (2022) report: Out of **1,536 laws regulating businesses**, more than **50% carry imprisonment clauses**.
  - Out of **69,233 compliances**, 37.8% carried jail terms.
  - Such laws deter entrepreneurship, investment, and innovation.
- **Judicial Overload: 3.6 crore pending criminal cases** in district courts, with **2.3 crore cases older than 1 year** (As of Aug 2024).
  - Criminalisation of minor defaults diverts resources from adjudicating serious crimes.
- **Modernising Governance:** Many laws are rooted in outdated morality and paternalism of the state.
  - Reform is needed to align laws with **contemporary business practices, citizen-friendly governance, and economic growth**.

Source: Indian Express

Sundarbans Tiger Reserve (STR)

Context

The **National Board of Wildlife (NBWL)**, chaired by the Union Minister for Environment, Forest and Climate Change, has given its approval to the **West Bengal government's proposal to expand the Sundarbans Tiger Reserve (STR)**.

About Sundarbans Tiger Reserve (STR)

- **Location:** West Bengal.
- **Feature:** Only **mangrove forest** in the world (apart from Bangladesh) with a significant tiger population.
    - **Borders:**
        - **East:** International boundary with Bangladesh, marked by rivers Harinbhanga, Raimangal, and Kalindi.
        - **South:** Bay of Bengal.
        - **West:** River Matla.
        - **North-West:** Rivers Bidya and Gomdi.
- **Special Recognition:**
    - The National Park area within STR is a **UNESCO World Heritage Site**.
    - Also part of the **Sundarban Biosphere Reserve**.

Procedure to Declare or Alter a Tiger Reserve

- **Declaration of Tiger Reserve *(Section 38V, Wildlife Protection Act, 1972)***
    - Tiger Reserves are notified by **State Governments** based on the advice of the **National Tiger Conservation Authority (NTCA)**.
    - **Steps involved:**
        - State Government submits a proposal.
        - NTCA provides **in-principle approval**, asking for detailed proposals.
        - After due scrutiny, NTCA recommends the proposal back to the State.
        - State Government issues the official **notification** declaring the Tiger Reserve.
- **Alteration of Tiger Reserve Boundaries *(Section 38W, Wildlife Protection Act, 1972)***
    - Boundaries of a Tiger Reserve cannot be altered without:
        - Recommendation of the **Tiger Conservation Authority**, and
        - Approval of the **National Board for Wildlife (NBWL)**.
    - Proposals for alteration are also initiated by the **State Government**.

Source: DTE

Arctic Sea Melting

Context

A new study has revealed that the pace of sea ice loss in the Arctic sea has slowed down in the past 20 years.

Causes of Arctic Sea Ice Slowdown

- **Pacific Decadal Oscillation (PDO):** Long-term shifts in sea surface temperatures (SSTs) in the Pacific Ocean. A "cool phase" brings cooler waters, reducing Arctic warming.
- **Atlantic Multidecadal Variability (AMV):** Multi-decade fluctuations in North Atlantic SSTs. A cooler phase reduces heat flow to the Arctic.
- Together, these cycles bring **anomalously cooler waters** into the Arctic, slowing ice melt temporarily.

Implications of Arctic Sea Ice Slowdown

- **No Reversal of Climate Change:** Despite slower melting, GHG levels and global mean temperatures are still rising.
    - Slowdown does **not imply climate change is slowing**.
- **Risk of Rapid Future Melting:** Models indicate that after slowdown ends, the **pace of melting could be faster** than the long-term trend (extra 0.6 million sq. km per decade).
    - Sudden acceleration will worsen climate instability.
- **Amplified Global Warming:** Arctic sea ice acts as a **reflective shield (albedo effect)**. Its loss exposes darker ocean waters, which absorb more heat → **positive feedback loop** for warming.
- **Sea Level Rise:** Melting sea ice contributes indirectly to sea level rise by destabilising Greenland ice sheets and altering ocean circulation.
- **Impact on Global Climate Systems:** Alters jet streams and atmospheric circulation, increasing risks of extreme weather (heatwaves, floods, cold snaps).
- **Ecosystem Disruption:** Threatens species like polar bears, seals, and walruses that rely on sea ice.
    - Indigenous communities dependent on Arctic ecosystems also face livelihood challenges.

Source: Indian Express

Asia-Pacific Institute for Broadcasting Development (AIBD)

Context

India has been elected as the **Chairman of the Executive Board of the Asia-Pacific Institute for Broadcasting Development (AIBD)** during its 23rd General Conference held in Thailand.

About AIBD

- **Establishment:** Created in **1977 under UNESCO's initiative**, it is a unique regional **intergovernmental body.**
- **Headquarters:** Kuala Lumpur, Malaysia.
- **Aim:** To foster a **dynamic and collaborative electronic media landscape** across the Asia-Pacific region.
- **Membership:** 92 member organizations from 45 countries.
- **India's Role:** A **founding member** of AIBD, with **Prasar Bharati (India's public broadcaster)** representing the Ministry of Information & Broadcasting in the organization.

Source: PIB

Article 311

Context

The Jammu and Kashmir Lieutenant Governor has dismissed two employees for alleged **terror links**, invoking **Article 311(2)(c) of the Constitution**.

About Article 311

- Governs **dismissal, removal, or reduction in rank** of persons employed in civil capacities under the Union or a State.
- **Article 311(1):** A civil servant **cannot be dismissed or removed** by an authority **subordinate to the appointing authority**.
- **Article 311(2):** No civil servant can be dismissed, removed, or demoted **without an inquiry**.
    - The employee must be given **prior notice of charges** and a **reasonable opportunity to defend themselves**.
- **Exception – Article 311(2)(c):** The requirement of inquiry can be **dispensed with in the interest of the security of the state**.

Source: The Hindu

Indian Ports Act, 2025

Context

Rajya Sabha passed the Indian Ports Bill, 2025, replacing the colonial-era Indian Ports Act, 1908.

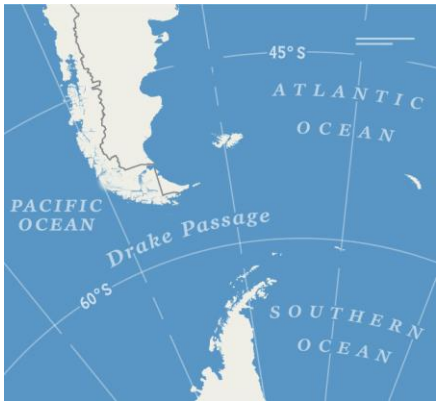
Key Provisions

- **Maritime State Development Council Boards:** To be set up by the **Central Government**.
  - Union Minister for Ports, Shipping and Waterways will be the **ex-officio Chairperson**.
- **Statutory Recognition of State Maritime Boards:** Constituted by State Governments.
  - Responsible for the **administration and management of non-major ports**.
- **Dispute Resolution Mechanism:** States to establish **Dispute Resolution Committees (DRCs)** for non-major port disputes.
  - Appeals to lie before the **High Court**.
  - **Civil courts barred** from jurisdiction in such matters.
- **Port Tariff Regulation:**
  - **Major Ports:** Tariff fixed by the **Board of Major Port Authority** or by company boards (if under Companies Act, 2013).
  - **Non-Major Ports:** Tariff fixed by **State Maritime Boards**.
- **Notification of New Ports & Alteration of Port Limits:** Central Government empowered to notify new ports or alter limits, in **consultation with State Governments**
- **Mega Ports:** Central Government, in consultation with States, may **define criteria** for classifying a port as a **mega port**.
- **Environmental & Safety Compliance:** Provisions aligned with **international conventions** like:
  - **MARPOL** – International Convention for the Prevention of Pollution from Ships.
  - **Ballast Water Management Convention** – for marine ecosystem protection.

Source: The Hindu

PLACES IN THE NEWS

Drake Passage



News? A 7.5 magnitude earthquake has struck the Drake Passage.

- **Location:** Lies between **Cape Horn** (southern tip of South America) and the **South Shetland Islands** (north of the Antarctic Peninsula).
- Named after **Sir Francis Drake.**
- Served as a vital **trade route** before the opening of the **Panama Canal in 1914**.

Source: TOI

Editorial Summary

India's dairy sector

Context

Recently, debates around India's dairy competitiveness, especially under pressure to open markets to US and EU products, highlight both the strengths and vulnerabilities of the sector.

India's Dairy Sector

- India has been the **largest milk producer since 1998**, contributing **~25% of global output**.
- **State-wise Trends:**
  - **Uttar Pradesh**: Largest producer (16.21% share).
  - **West Bengal**: Fastest growth (9.76% in 2023-24).
- **Livestock Base:**
  - **World's largest livestock owner**: 303.76 million bovines, 74.26 million goats.
    - Total livestock: 536.76 million.
- **Farmer Participation**
  - **~50 million dairy farmers**; about **8 crore people employed**.
  - Strong cooperative network: **22 milk federations, 240 district unions, 28 marketing dairies, 24 producer organizations**.
  - Women's participation significant – **35% members in cooperatives** with **48,000 women dairy societies**.
- **Economic Contribution:** Dairy is India's **largest agricultural commodity**, contributing **~5% to GDP**.

Operation Flood (1970–1996)

- Launched by the **National Dairy Development Board (NDDB)**.
- World's **largest dairy development programme**, also called the **"White Revolution of India"**.
- Aimed to transform India from a **milk-deficient country to the world's largest milk producer**

Key Schemes Driving India's Dairy Sector

Scheme	Launch	Focus / Objective	Key Features / Components
Rashtriya Gokul Mission	2014 (Revised 2021-26)	Development & conservation of **indigenous breeds**	• Free **AI services** under Nationwide AI Programme • Breed improvement & genetic enhancement
National Programme for Dairy Development (NPDD)	2014 (Restructured 2021-26)	Strengthen **milk procurement, processing & marketing**	• Infrastructure development • Implemented through **State Dairy Federations**
Livestock Health & Disease Control Programme (LHDCP)	Revised 2025	Improve livestock health & disease control	• **NADCP** (disease eradication) • Veterinary hospitals & Mobile Vet Units • **Pashu Aushadhi** (low-cost veterinary medicines)

National Livestock Mission (NLM)	2014-15 (Revised 2021-22)	Boost productivity & rural entrepreneurship	• **Breed Development** • **Feed & Fodder Development** • **Extension & Innovation** (training & awareness)
Animal Husbandry Infrastructure Development Fund (AHIDF)	2020 (Atmanirbhar Bharat Abhiyan)	Promote private investment in livestock infra	Incentivises investment in: Dairy & meat processing, Animal feed plants, Breed improvement farms & tech
Kisan Credit Card (KCC) for Dairy Farmers	Since 2019	Extend **institutional credit** to livestock & dairy farmers	Loans for **fodder, veterinary care, infrastructure** - Inclusion of dairy farmers in **KCC coverage**

Challenges in India's Dairy Sector

- **Over-dependence on Cheap Labour:** Competitiveness rests on low-cost family labour, which is becoming **scarce and costly** due to rising education and alternate employment.
- **Low Milk Yields:** Poor genetics of indigenous breeds, inadequate breeding programs, and limited focus on scientific cattle management.
    - **E.g.,** India's average yield is **1.64 tonnes per cow annually** (2024, USDA data), compared to **11 tonnes in the US** and **7.3 tonnes in EU**.
- **Feed & Fodder Constraints:** India lacks abundant land for high-protein fodder like alfalfa (unlike New Zealand's pasture-based model).
    - Heavy dependence on **purchased feed** increases costs.
- **Limited Mechanisation:** High **capital and energy costs** restrict automation in milking, feeding, and storage compared to the West.
- **Fragmented Production System:** Dairy farming is dominated by **smallholder farmers** with 2–3 animals, making scaling and efficiency improvements difficult.
    - **E.g.,** India has **50 million dairy farmers with 110 million milch animals**, compared to the US, where just **24,000 dairy farms** manage ~9 million cows (2022).
- **Future Viability:** Current model does not account for the **opportunity cost of family labour and land**, making long-term sustainability uncertain.

Way Forward

- **Boosting Productivity:** Genetic improvement through **selective breeding, AI (artificial insemination), and genomic tools**.
    - Use of cross-breeds and indigenous high-yield varieties.
- **Fodder & Nutrition Security:** Promote **on-farm cultivation of high-protein green fodder grasses**.
    - Strengthen fodder banks and feed-processing industries.
- **Selective Mechanisation:** Introduce **affordable small-scale mechanisation** (milking machines, chilling units) suited for smallholder conditions.
- **Strengthening Cooperatives & Farmer Producer Organisations (FPOs):** Expand the **Amul model** of cooperative marketing to increase farmers' share in the consumer rupee.
- **Value Addition & Diversification:** Promote processing into **cheese, yogurt, butter, milk powder** for domestic and export markets.
- **Policy & Institutional Support:** Invest in **research, extension services, veterinary care**.
    - Ensure **climate-resilient dairying** practices.

Source: Indian Express