

India must transition from Service-Driven Economy to becoming a Product Nation

Present geopolitical situation amid conflicts, trade wars, unilateral tariffs etc. has intensified a consensus that India has to strive to transform into a Product Nation.

About Product Nation

- ▶ A product nation is a country that produces and exports a substantial volume of high-value goods, **becoming a net producer** rather than a net importer.
- ▶ Product nation not only innovates but also **manufactures and exports Intellectual Property (IP)-driven solutions** across sectors.

Need for the transition

- ▶ **Strategic Leverage:** More strategic one country's products are, greater is its strategic leverage.
 - ⊕ For instance, Taiwan has its hold over most advanced chips in the world and China has its hold over rare earth minerals.
- ▶ **Increasing share in Global Supply Chain:** By creating India's own branded high-value products through IP-curated designs.
- ▶ **Enhance Economic Resilience:** A product-based economy with strong manufacturing and innovation is more resilient to global economic downturns.

Initiatives taken to make India a Product Nation

- ▶ **Production Linked Incentive (PLI) Schemes:** Focuses on 14 critical sectors to boost domestic manufacturing through targeted, performance-based incentives.
- ▶ **Design Linked Incentive Scheme:** Offers financial incentives as well as design infrastructure support for semiconductor designs.
- ▶ **Key Innovation Missions:** Including National Quantum Mission, Atal Innovation Mission, IndiaAI Mission, etc.
- ▶ **National Logistics Policy:** To drive economic growth and competitiveness.

Way Forward

- ▶ **Fostering global partnerships:** With countries like Taiwan to leverage their expertise in manufacturing and innovation.
- ▶ **Prioritise Research and Development (R&D):** Allocating higher budgets for research and encouraging collaboration between academia, industry, and government to drive innovation.
- ▶ **Investing in Human Capital:** Reforming education and skill development programs to align with the needs of a product-driven economy.
- ▶ **Enhancing Policy Support:** Establishing clear, industry-friendly policies to incentivise manufacturing and address regulatory bottlenecks.

ISRO successfully completes first Integrated Air Drop Test for Gaganyaan Mission

The test was a joint effort of **ISRO, Indian Air Force, DRDO, Indian Navy, and Indian Coast Guard.**

- ▶ Additionally, ISRO is also preparing for upcoming tests such as the **second Test Vehicle Demonstration (TV-D2)** mission and the first **uncrewed Gaganyaan mission (G1).**

About Integrated Air Drop Test (IADT-01)

- ▶ It involved **end-to-end demonstration of parachute-based deceleration system.**
- ▶ It was a critical exercise to validate the parachute system **that will bring back astronauts safely under the Gaganyaan mission.**

About Gaganyaan Mission

- ▶ Envisages demonstration of **human spaceflight capability** by launching **crew of 3 members** to an **orbit of 400 km** for a **3 days mission** and bring them back safely to earth.
- ▶ **Launch vehicle:** Human rated LVM3 (HLVM3).
 - ⊕ **HLVM3 is a re-configured version of LVM3** (formerly known as the GSLV Mk-III) consisting of **three-stage rocket** - solid stage, liquid stage, and cryogenic stage, to meet human rating requirement.
- ▶ Successful launch of Gaganyaan **will make India only the 4th country** (after the **US, Russia, and China**) that have launched crewed spacecraft.

Related News

On the **National Space Day (Aug 23)**, Union Minister for Science & Technology charted out India's future space roadmap.

Upcoming Planned Indian Space Missions

- ▶ **Bharat Antariksh Station:** Space station proposed to be established by 2035.
- ▶ **Placing an astronaut on the Moon by 2040:** An endeavour that would symbolically mark the country's journey towards becoming a developed nation by 2047.
- ▶ **Others:** Chandrayaan-4, Mission to Venus, etc.

Parliamentary Committee highlights India's low Cattle and Buffalo Productivity

Report by **Standing Committee on Agriculture, Animal Husbandry and Food Processing** examines **National Dairy Development Board's (NDDB)** role in protecting and developing indigenous cattle breeds in achieving the targets set under the **Rashtriya Gokul Mission**.

Status of Indigenous Breeds of Cattle and Buffaloes

- India officially recognizes **53 indigenous cattle breeds** and **21 indigenous buffalo breeds**.
- **Average daily milk productivity:** For indigenous cattle rose to **3.54 kg by 2023-24**, and for buffaloes to **5.92 kg**.
 - ⊕ Despite increase, **productivity remains significantly lower** than exotic/crossbred cattle (8.52 kg/day in 2023-24) and international benchmarks (e.g., Israel: 13656 kg/year, USA: 10954 kg/year for cattle in 2022).

Reasons for Low productivity

- **Limited Artificial Insemination (AI) Coverage:** AI coverage is restricted to only about 30% of breedable bovines across the country.
- **Shortage AI Technicians:** Against a requirement of 2,02,469 AI technicians, only 1,16,586 are currently available.
- **Poor Scalability:** More than **80% of low-producing indigenous animals** are reared by **small and marginal farmers and landless laborers**.

Key Recommendations

- **Revision of Criteria for Critical Cattle and Buffalo Breeds:** To a minimum population of 50,000 animals to ensure a sufficient reference population for genomic selection and to provide a buffer against mass eradication from disease.
- **Inclusive Breed Improvement Programmes:** To include **state-dominant indigenous breeds from all states** of the country to prevent their replacement by a few high-yielding breeds.
- **Fix Accountability:** **Disincentivize shortfalls and fix responsibility** for recurring issues in semen production and sale across all semen stations, ensure **sex-sorted semen production and distribution**, etc.

Initiatives for Indigenous Breed Development of Cattle and Buffalo

- **Rashtriya Gokul Mission (RGM):** Initiated in 2014, is a major scheme for indigenous breed development and conservation.
- **Accelerated Breed Improvement Programmes:** For using **IVF technology and sex-sorted semen**.
- **"GAUCHIP" and "MAHISHCIP":** Genomic selection tools to accelerate genetic improvement.
- **Bharat Pashudhan App:** An integrated digital platform for livestock identification, breeding, and health management.

No Sand Mining clearance without replenishment Study: Supreme Court

Upholding the **NGT's cancellation of a 2022 approval in Jammu & Kashmir**, Supreme Court observed that **replenishment data is a mandatory prerequisite for environmental clearance** in addition to the **District Survey Report (DSR)**.

Key highlights of Supreme Court Observations

- **Essentiality of Replenishment Study:** Absence of such a study renders a DSR fundamentally defective, as it lacks the foundational data for determining sustainable extraction limits.
- **Natural Regeneration Principle:** Just as trees must regrow before felling, sand mining requires a **recharge study** to ensure rivers remain balanced.

About Sand Mining

- It refers to the **removal of natural sand and related resources** such as minerals and stones from riverbeds, land, or other environments for use in construction and processing.
- **Environmental Implications of unrestricted sand-mining:** Drawing from the **Deepak Kumar v. State of Haryana judgment**, the Court highlighted that unrestricted sand mining causes significant environmental degradation, including:
 - ⊕ Riverbank erosion and **habitat loss**,
 - ⊕ Lowering of **groundwater tables** and aquifer damage,
 - ⊕ Threats to **biodiversity**, including fish breeding grounds,
 - ⊕ Increased flood risks due to **destabilised riverbeds**,
 - ⊕ Declining **water quality** and higher turbidity levels, etc.

Existing Legal Framework for Sand Mining in India

- **Environment (Protection) Act, 1986:** Provides **overarching safeguards** for environmental protection.
- **Deepak Kumar vs State of Haryana (2012):** SC made **environmental clearance** mandatory for all minor mineral extractions, including sand.
- **EIA Notification (2016 Amendment):** Introduced cluster-based assessments and making replenishment studies a key part of the District Survey Report.
- **Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines, 2020:** Require the calculation of the **annual replenishment rate** to determine safe, sustainable mining limits.

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

IADWS is expected to offer multiple layers of protection by **combining surveillance, threat identification, and air defence systems** to detect and destroy threats, including long-range missiles, aircraft and unmanned aerial vehicles, along the borders and at critical installations.

About IADWS

- **Components:** IADWS is a **multi-layered air defence system** comprising:
 - ⊕ **Indigenous Quick Reaction Surface to Air Missiles (QRSAM):** Developed by **DRDO**.
 - ◆ It is a short-range (5 to 30 km range) SAM system designed to protect moving armoured columns from aerial attacks.
 - ◆ It is configured on mobile platform and is capable of providing air defence on the move.
 - ⊕ **Advanced Very Short Range Air Defence System (VSHORADS) Missiles:** Developed by **Research Centre Imarat (RCI)**.
 - ◆ It is a **Man Portable Air Defence System (MANPADS)** designed to neutralize low-altitude aerial threats at short ranges.
 - ⊕ **A high-power laser-based Directed Energy Weapon (DEW):** Developed by **Centre for High Energy Systems and Sciences**.
 - ◆ **Laser-DEW** can **engage targets at the speed of light** and use an intense laser beam to cut through the target, leading to structural failure or more impactful results if the warhead is targeted.
- **Command Centre:** Integrated operation of all the weapon system components is controlled by a **Centralised Command and Control Centre** developed by **Defence Research & Development Laboratory (DRDL)**.
 - ⊕ DRDL is the **nodal laboratory** of the programme.

Plants emerged as the most economically impactful invasive species: Study

The study reported that the **damage from invasive plants and animals** expanding into new ecosystems has **cost society more than \$2.2 trillion worldwide**.

- **Plants** emerged as the **most economically impactful invasive species** followed by arthropods and mammals.

Invasive Species

- Invasive species are those **plants, animals, or microorganisms that do not naturally belong to a region** but, once introduced, **spread quickly and disturb the local balance**.
- In **India**, common examples include **Lantana camara** that clogs forests, **Parthenium hysterophorus** (Congress grass) spreading on farmland, **Eichhornia crassipes** (water hyacinth) choking water bodies, and the **African catfish** threatening native fish diversity.

Implications of Invasive Species

- **Affect Food Web:** They often **outcompete** native species for resources, degrade ecosystems, reduce agricultural yields, and can even **spread diseases**.
- **Upset Ecological Balance:** They **reduce biodiversity** by pushing native species to the margins.
- **Helping Ecosystems:** In rare cases, invasive species have **supported declining species or provided key ecosystem services** like non-native honey bees serving as surrogate pollinators.

Control Measures

- **Prevention:** Stop new invasive species from entering through **stricter checks on trade, travel, and shipping (like ballast water management)**.
- **Control Measures:** Utilizing **Biological Control** (using plant diseases, insect predators, parasitoids, pathogens etc.), **Mechanical Control**, and **Chemical Control** (herbicides, pesticides, insecticides or fungicides, etc.)
- **Eradication and Restoration:** Remove invasive species completely in early stages, and restore ecosystems through reintroducing native species and improving habitats.

Also In News



Crop Residue

New study finds that crop residue has severe **consequences for agroecological biodiversity**, driving pest outbreaks in agricultural field.

- **Crop residues** are materials left on cultivated land after the crop has been harvested.

Key Findings of Study

- Burning crop residue **depletes soil nutrients**, undermining long-term productivity.
- Air pollution released during the process also **disrupts the ecological functions of arthropods and birds**.
- **Natural predators** like spiders, ladybirds, frogs, and earthworms decline, reducing ecosystem balance.
- Loss of insects and predators creates cascading effects across trophic levels and **disrupts food web**.



Free Movement Regime

Assam Rifles has mapped 42,000 Myanmar nationals entered India under the new **Free Movement Regime (FMR)**.

About Free Movement Regime

- It is a **bilateral arrangement between India and Myanmar** that allows border tribes to cross without passports or visas.
- Formalized in 2018, through the **Agreement on Land Border Crossing**, it permits **free movement up to 16 km**.
- In **February 2024**, the **Union Home Minister announced its withdrawal** citing security and demographic concerns.
 - ⊕ However, its formal scrapping is **yet to be notified**.
- In **December 2024**, Union Government brought **new system for movement across India-Myanmar border**.

Key Features of New System

- Assam Rifles to issue **single-entry passes, valid for 7 days within 10 km**.
- Passes must be **returned at the same crossing point**.
- Each point will be **manned by police and health officials** along with Assam Rifles.



Kursk Region

It was reported that Ukrainian drone attack sparked a short-lived fire at the **Kursk Nuclear Power Plant** in Russia.

About Kursk Region

- **Location:** Situated in the European part of Russia, with its western border adjoining Ukraine.
- **History:** Famous for the **Battle of Kursk (1943)**, the largest tank battle in history and a turning point in World War-II.
- **Geography:** The region lies within the basins of the Dnieper and Don rivers.
- **Minerals:** It hosts the Kursk Magnetic Anomaly, the world's largest magnetic anomaly and one of the richest iron ore deposit.



International Big Cat Alliance (IBCA)

Nepal has officially joined the International Big Cat Alliance (IBCA), an India-led global initiative.

About IBCA

- **Genesis:** Launched in April 2023 (occasion of 50 years of India's Project Tiger).
- **Aim:** Global Conservation of seven Big Cats namely Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar & Puma.
- **Secretariat Headquarter:** India.
- **Structure:** Multi-country, multi-agency coalition comprising of 95 big cat range countries, non-range countries with an interest in big cat conservation.
- **Member Countries:** 13 Member Countries including India.



James Webb Space Telescope

James Webb Space Telescope finds the **29th Moon of Uranus** named temporarily **S/2025 U1** as the official name is yet to be chosen by the International Astronomical Union.

About James Webb Space Telescope

- **Launch:** Dec, 2021 jointly by NASA/ESA/CSA.
- **Duration:** 5 - 10 years.
- **Type:** Orbiting infrared observatory.
- **Orbit:** It does not orbit around the Earth like the Hubble; it orbits the **Sun 1.5 million kilometers** away from the Earth at second Lagrange point or L2.
- **Purpose:** Study every phase in the history of our Universe, ranging from the first luminous glows after the Big Bang, to the formation of solar systems.



Mount Kilauea

Recently, **Kilauea volcano** erupted in Hawaii, a group of volcanic islands in the central Pacific Ocean.

- **Hawaii** is the only US state completely made up of islands.

About Kilauea volcano

- Eruptions have been occurring in the **Halemaumau Crater** which is part of the Hawaii Volcanoes National Park.
- It is one of the **most active volcanoes** in the world.
- Current eruption has been characterized by **episodic lava fountaining** not seen in any eruptions since the **1983–86** episodic fountains.
- **High levels of volcanic gas:** Primarily water vapor (H₂O), carbon dioxide (CO₂), and Sulphur Dioxide (SO₂).



Consumer Protection Act

Supreme Court ruled that consumer forums **can enforce all their orders**, not just interim ones, treating them **like civil court decrees**.

- This corrects the **2002 amendment** to the Consumer Protection Act, 1986, which had limited forums' powers.
- The **Consumer Protection Act 1986** has been **replaced by the Consumer Protection Act (CPA) 2019**.
 - ⊖ CPA 2019 provides for creation of a **Central Consumer Protection Authority (CCPA)** and simplification of adjudication process in Consumer Commissions.



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

India is believed to have deployed an **AI-enabled X-Guard Fibre-Optic Towed Decoy (FOTD)** system during Operation Sindoor.

About X-Guard FOTD system

- **Developed** by Israel's Rafael, it **works synergistically** with an aircraft's onboard Electronic Warfare (EW) equipment to defeat most sophisticated radars.
- **The system** can be used at low and high altitude, and subsonic to supersonic velocity.
- **Deployed either** when the aircraft approaches a threatened area or upon detection of an imminent threat, it is retractable in flight.
- **It maintains** both electrical and fiber-optic continuity throughout the flight.

Personality in News



Vitthalbhai Patel (1873-1933)

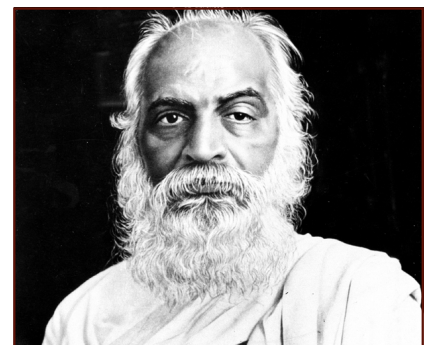
All India Speakers' Conference commemorates the completion of **100 years of Vitthalbhai Patel becoming the first elected Indian President of the Central Legislative Assembly** (August 1925).

About Vitthalbhai Patel

- **Born:** Nadiad, Gujarat.
- He was the **elder brother of Sardar Vallabhbhai Patel** and an eminent political leader, lawyer, and social reformer.

Key Contributions

- Devoted himself to bringing about both social and political reforms to successfully fight for India's freedom.
- **Became Member of Bombay Legislative Council.**
- **Elected to the Imperial Legislative Council in 1918.**
- **Swaraj Party:** Co-founded the Swaraj Party with Motilal Nehru and Chittaranjan Das in 1922.
- He served as the **Mayor of Bombay Municipal Corporation from 1923 till 1925.**



AHMEDABAD



BENGALURU



BHOPAL



CHANDIGARH



DELHI



GUWAHATI



HYDERABAD



JAIPUR



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RANCHI