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INDIA -ISRAEL RELATIONS

Prime Minister Narendra Modi's February 2026 standalone visit to Israel occurs amid escalating West Asian instability – U.S.-Iran tensions, fragile Gaza ceasefire, and emerging regional blocs.

The visit signals consolidation of India-Israel ties beyond symbolism, with strategic, economic and geopolitical implications.



Main Arguments

1. Deepening Strategic and Defence Convergence

India and Israel face common security threats – terrorism, hostile neighbourhoods, and missile/drone warfare. According to SIPRI, India accounted for nearly **34% of Israel's arms exports (2020-24)**, making it Israel's largest defence customer. Cooperation has shifted from buyer-seller to **joint development and co-production**.

- **Barak-8 missile defence system** exemplifies co-development success.
- "India-Israel Vision on Defence Cooperation" (2022) emphasised futuristic technologies.
- Reports indicate focus on the **Iron Beam laser-based air defence system**, aligned with India's Mission *Sudarshan Chakra* for integrated air and anti-drone defence.
- Growing private-sector collaboration (e.g., surveillance and sensor-based systems).

For India, lessons from *Operation Sindoor (May 2025)* underline the urgency of layered air and missile defence architecture.

2. Science, Technology and Innovation Linkages

Israel's technological ecosystem complements India's development needs.

- Over **35 Centres of Excellence (CoE)** across Indian states support high-density horticulture (mango, citrus, pomegranate, date palm, beekeeping).
- MASHAV agreements with Haryana (2022) and Rajasthan (2024) enhance integrated water management – critical amid India's rising water stress.
- Emerging focus areas: Artificial Intelligence (AI), agritech, electronics, medical equipment.

This cooperation aligns with India's push for *Atmanirbhar Bharat* and tech-led growth.

3. Expanding Economic and Trade Architecture

While security dominates headlines, trade is substantial. Bilateral trade reached **\$3.75 billion in FY 2024-25**, with diversification beyond diamonds and chemicals into high-tech sectors.

Recent developments:

- **Bilateral Investment Agreement (September 2025)**
- Terms of Reference for a **Free Trade Agreement (FTA)** (November 2025).

An FTA could integrate Israel into India's recent trade momentum (EU, Oman, UAE agreements). Additionally, proposals on infrastructure cooperation and human mobility could deepen interdependence.

4. India-Middle East-Europe Economic Corridor (IMEC)

Announced at the G-20 Summit (Delhi, 2023), IMEC aims to provide a shorter and secure route linking India to Europe via West Asia. With the **Suez Canal vulnerable to disruptions**, IMEC offers strategic diversification.

However, Gaza stability remains crucial. The visit may revive momentum amid renewed geopolitical urgency.

5. Gaza Peace Process and Regional Balancing

India attended the February 2026 “Board of Peace” Summit as an observer. With strong ties to Israel, UAE, Saudi Arabia, Jordan and Oman, India maintains strategic balance.

Netanyahu’s proposal of a “hexagon alliance” reflects bloc politics. However, India’s foreign policy doctrine emphasises **strategic autonomy**, avoiding entanglement in sectarian axes (Shia-Sunni rivalry).

India’s energy security – given dependence on Gulf imports – necessitates cautious engagement regarding Iran and broader regional tensions.

Criticisms / Challenges

- **Risk of Over-Securitisation:** Excessive defence focus may overshadow balanced diplomacy.
- **Palestinian Sensitivities:** Standalone Israel visit could attract criticism domestically and internationally.
- **Regional Bloc Politics:** Joining or appearing aligned with anti-Iran blocs could complicate India’s West Asia balancing strategy.
- **IMEC’s Fragility:** Corridor viability depends on durable regional peace.
- **Energy Security Concerns:** Escalation involving Iran could disrupt oil supplies and increase import bills.

Way Forward

- **Maintain De-hyphenation Policy:** Engage Israel and Palestine independently while supporting a two-state solution.
- **Strengthen Co-Production:** Move from arms imports to joint R&D and defence manufacturing in India.
- **Fast-Track FTA Negotiations:** Expand high-tech trade and innovation ecosystems.
- **Promote IMEC Diplomatically:** Integrate Gulf partners to stabilise connectivity initiatives.
- **Leverage Balanced Diplomacy:** Use ties with Gulf states and Israel to contribute constructively to peace-building efforts.

The visit underscores India’s calibrated West Asia strategy – deepening strategic ties with Israel while preserving regional balance. If managed prudently, the engagement could enhance India’s defence preparedness, technological modernisation and connectivity ambitions without compromising strategic autonomy.

VILLAGES OF EXCELLENCE

The Villages of Excellence is a grassroots-level extension of the **Indo-Israel Agriculture Project (IIAP)**. While previous cooperation focused on centralized high-tech hubs, this initiative aims to transform entire farming clusters into modern, technology-driven agricultural zones by integrating Israeli expertise directly into local village ecosystems.

Aim:

- The primary goal is to **bridge the gap** between high-tech research centers and the common farmer.
- By taking Israeli technology from the Centres to the Villages, the initiative aims to significantly increase the productivity and income of lakhs of Indian farmers through sustainable, future-ready farming solutions.

Key Features:

- **Expansion of CoEs:** A target has been set to increase the number of Centres of Excellence (CoEs) across India to 100.
- **Grassroots Integration:** Developing villages located around existing CoEs to act as models for surrounding regions.
- **Technological Suite:** Implementation of precision farming, satellite-based irrigation, advanced nursery management, and integrated pest management.
- **IINCA Support:** Supported by the newly established India-Israel Innovation Centre for Agriculture (IINCA), which provides the research base for these villages.
- **Capacity Building:** Training for farmers on-site and the launch of 20 joint fellowships for Indian researchers to study in Israel.

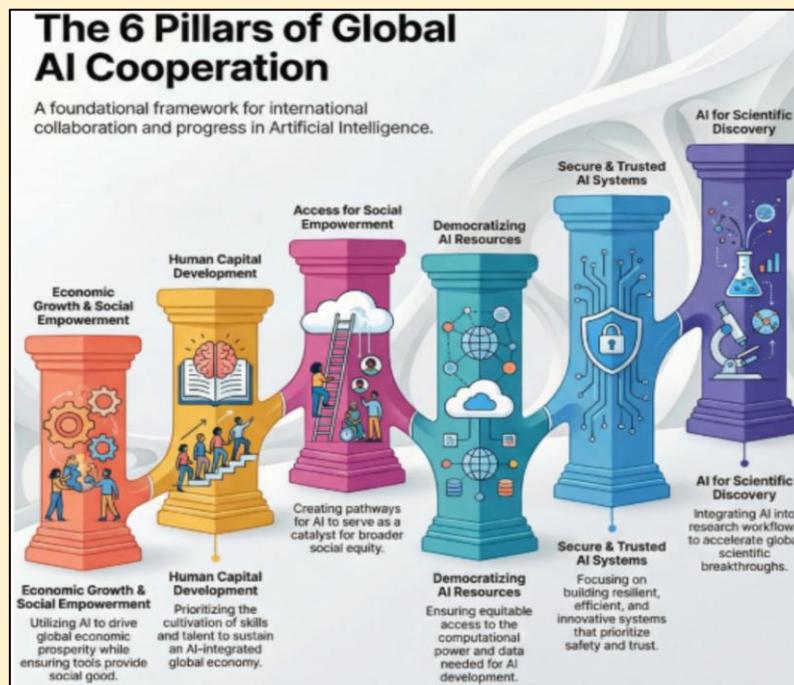
Significance:

- Directly targets the doubling of farmers’ income by reducing waste and increasing crop yields.
- The initiative is a cornerstone of the newly elevated Special Strategic Partnership for Peace, Innovation & Prosperity between the two nations.

AI IMPACT SUMMIT

The **AI Impact Summit** concluded in New Delhi with 89 countries and international organizations endorsing the **New Delhi Declaration**.

- This landmark agreement establishes a global framework for “AI for All,” focusing on equitable access, ethical governance, and social empowerment.



- The New Delhi Declaration is a comprehensive, multi-nation consensus document aimed at governing the development and deployment of Artificial Intelligence.
- Grounded in the philosophy of “Sarvajana Hitaya, Sarvajana Sukhaya” (Welfare for all, Happiness for all), it serves as a non-binding roadmap for international AI cooperation.

Aim: The declaration seeks to bridge the AI Divide by ensuring that foundational AI resources, such as computing power and data, are not concentrated in a few nations but are democratized for global economic growth and social good.

Key Features of the Declaration:

- **Seven Pillars (Chakras) Framework:** Built around seven pillars including democratizing AI resources, secure AI, human capital development, AI for science, and resilient AI systems.



- **Global Collaborative Platforms:** Launch of initiatives like Global AI Impact Commons, Trusted AI Commons, and AI for Social Empowerment Platform to enable shared learning and innovation.

1. Global AI Impact Commons

- A voluntary global platform designed to help countries share and replicate successful AI solutions.
- It enables adoption and scaling of proven AI use-cases across regions to maximize development impact.

2. Trusted AI Commons

- A voluntary, non-binding collaborative repository that brings together AI tools, benchmarks, technical resources, and best practices.
- It helps stakeholders build secure and trustworthy AI systems adaptable to different national contexts.

3. International Network of AI for Science Institutions

- A voluntary collaborative network connecting scientific institutions worldwide to pool AI research infrastructure and expertise.
 - Its objective is to accelerate scientific innovation through AI-enabled research collaboration across countries.
- **Democratic Diffusion of AI Charter:** Promotes affordable access to foundational AI resources and supports locally relevant innovation ecosystems.
 - **Focus on Trusted & Secure AI:** Encourages voluntary technical standards, benchmarks, and best practices for safe AI deployment.
 - **Human Capital & Reskilling:** Introduces AI workforce development playbook and guiding principles for reskilling in an AI-driven economy.
 - **Energy-efficient & Resilient AI:** Emphasizes sustainable AI infrastructure and efficient systems to reduce energy and resource pressures.
 - **Multistakeholder & Sovereignty-based Approach:** Balances global cooperation with respect for national laws and policy frameworks.

Significance:

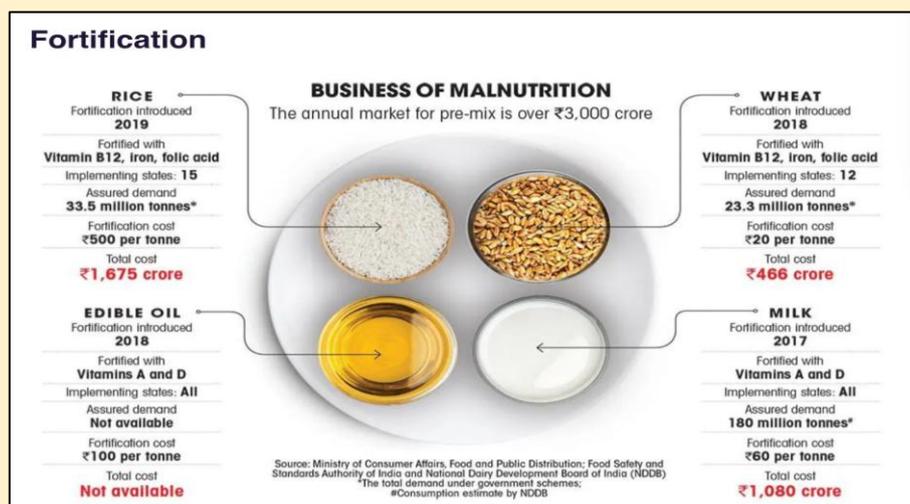
- **Global Governance Milestone:** Represents one of the largest multilateral consensuses on AI, with 89 countries aligning on shared AI principles.
- **India’s Leadership in AI Diplomacy:** Positions India as a key voice shaping inclusive AI governance through the philosophy of *Sarvajan Hitaya, Sarvajan Sukhaya*.

SUSPENSION OF FORTIFIED RICE UNDER PMGKAY

The Central Government has decided to temporarily discontinue the distribution of fortified rice under the PMGKAY and other welfare schemes due to shelf-life concerns.

What is Fortified Rice?

- Fortified rice is regular rice that has been deliberately enriched with essential micronutrients – specifically **Iron, Folic Acid, and Vitamin B12**.
- This is done to improve the nutritional quality of the food supply and combat hidden hunger or micronutrient deficiencies among vulnerable populations.



Associated Schemes:

The fortification initiative was integrated into India's largest social safety nets, including:

- **PMGKAY:** Pradhan Mantri Garib Kalyan Anna Yojana (Free foodgrain scheme).
- **TPDS:** Targeted Public Distribution System under the National Food Security Act (NFSA).
- **PM-POSHAN:** Formerly the Mid-Day Meal Scheme in schools.
- **ICDS:** Integrated Child Development Services (delivered through Anganwadi centres).

Aim:

- The primary goal was to address **malnutrition and anemia** nationwide by 2024. By making fortified rice mandatory in government schemes, the government aimed to provide a cost-effective and scalable public health intervention to improve the health of women and children.

Steps in Fortification:

- **Production of Fortified Rice Kernels (FRK):** Rice flour is mixed with a premix of vitamins and minerals and then shaped into grain-like kernels using an extruder machine.
- **Blending:** These FRKs are blended with regular polished rice, typically at a ratio of **1:100** (one fortified kernel for every 100 grains of regular rice).

Key Features:

- **Government Funded:** The entire cost of fortification is borne by the Government of India as part of the food subsidy.
- **Phased Implementation:** The rollout began in 2021 with the goal of covering all districts in India by June 2024.
- **Technical Support:** Organizations like the **World Food Programme (WFP)** provide technical assistance and training to millers and officials.

Current Challenge:

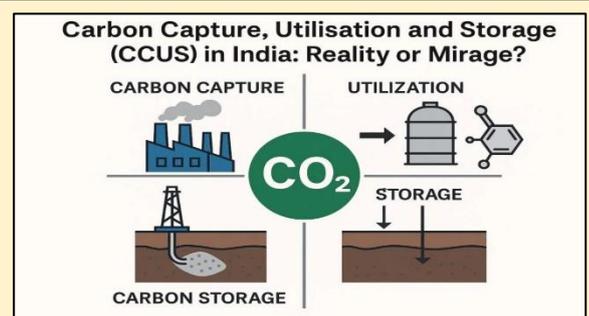
- The high buffer stocks in India mean rice often stays in silos for **2-3 years**.
- The IIT-Kharagpur study highlighted that moisture and humidity during this long duration degrade the nutrients, leading to the current suspension until a more robust delivery mechanism is found.

CARBON CAPTURE AND UTILISATION (CCU) TECHNOLOGIES

Carbon Capture and Utilisation (CCU) technologies aim to capture CO₂ from industrial sources or air and convert it into useful products. For India, the world's third-largest emitter, CCU offers a pathway to decarbonise hard-to-abate sectors while supporting a circular, low-carbon economy.

Main Arguments

- **Concept and Technological Basis of CCU:** CCU captures CO₂ from power plants, cement, steel, refineries or through Direct Air Capture and converts it into fuels (methanol, synthetic fuels), chemicals (olefins), building materials (carbonated concrete) or polymers. Unlike CCS, it reuses rather than stores carbon.
- **Relevance for Hard-to-Abate Sectors:** India's emissions are concentrated in cement, steel, chemicals and thermal power. Process emissions in cement (from limestone calcination) cannot be eliminated by renewables alone. CCU reduces point-source emissions and lowers carbon intensity of industrial output.
- **Emission Reduction Pathways:** CCU reduces emissions by:
 - Capturing CO₂ before atmospheric release.
 - Substituting fossil-derived feedstocks with CO₂-derived inputs.



- Permanently mineralising CO₂ in construction materials.
- Integrating with green hydrogen to produce low-carbon synthetic fuels.
- **Global Policy Support: EU Experience:** The EU Bioeconomy Strategy (2018) promotes sustainable use of biological and carbon resources, encouraging CO₂ as industrial feedstock. The Circular Economy Action Plan (2020), under the European Green Deal, supports industrial symbiosis and CO₂-based products. Carbon pricing under the EU ETS improves CCU viability.
- **International Industry Examples:** ArcelorMittal and Mitsubishi Heavy Industries, Ltd., with D-CRBN in Belgium, are converting captured CO₂ into carbon monoxide for reuse in steelmaking. The U.S. provides tax credits (e.g., 45Q) to incentivise CCU. UAE's Al Reyadah integrates CCU with green hydrogen hubs.

India's Current Status

- **Policy Roadmaps:** Department of Science & Technology has issued a dedicated CCU R&D roadmap. Ministry of Petroleum & Natural Gas released a draft 2030 CCUS roadmap identifying industrial clusters.
- **Industrial Pilots**
 - Ambuja Cements (Adani Group)-IIT Bombay Indo-Swedish pilot for CO₂-to-fuels/materials.
 - JK Cement CCU testbed for lightweight concrete and olefins.
 - Organic Recycling Systems Limited (ORSL) Bio-CCU platform converting biogas CO₂ into bio-alcohols.
- **Climate Commitments Alignment:** Supports India's 2070 Net Zero target and Panchamrit commitments under COP26.

Challenges / Risks

- **Cost Competitiveness:** CO₂ capture and conversion are energy-intensive; CCU products struggle against cheaper fossil-based alternatives without policy incentives.
- **Infrastructure Gaps:** Requires industrial clusters, CO₂ pipelines, purification systems, and green hydrogen availability. Infrastructure is uneven across Indian regions.
- **Regulatory and Market Uncertainty:** Absence of carbon pricing, lifecycle certification standards and green procurement mandates limits investor confidence.
- **Risk of Limited Net Gains:** If powered by fossil energy, CCU may not significantly reduce lifecycle emissions.
- **Financing Constraints:** High capital costs and technology risks deter large-scale private sector adoption.

Way Forward

- **Introduce Market Incentives:** Carbon pricing, tax credits, viability gap funding or Production-Linked Incentives for CO₂-derived products.
- **Develop CCU Industrial Clusters:** Integrate CCU in cement and steel hubs (e.g., Gujarat, Odisha) with shared capture and utilisation infrastructure.
- **Align with National Green Hydrogen Mission:** Use green hydrogen to enhance CO₂-to-fuel conversion efficiency and reduce lifecycle emissions.
- **Establish Certification Frameworks:** Develop lifecycle carbon accounting standards and green product labelling to create market demand.
- **Strengthen R&D and PPPs:** Scale pilot projects into commercial demonstration plants with blended finance and global climate funds.

CCU can serve as a transitional decarbonisation tool for India's industrial economy. However, its success depends on coherent policy support, clean energy integration, cost reduction and robust regulatory standards to ensure genuine emission reductions rather than symbolic compliance.

INTERNATIONAL CLIMATE INITIATIVE (IKI)

Germany and India have launched a new Large Grant project (approx. ₹180 crore) under the International Climate Initiative (IKI) to strengthen India's climate resilience.



About International Climate Initiative (IKI):

- **Nature:** The **International Climate Initiative (IKI)** or **Internationale Klimaschutzinitiative** is a key **financial instrument of the German government** that funds international projects focused on climate change mitigation, adaptation, and biodiversity conservation in developing and emerging economies.
- **Establishment:** It was launched **in 2008 by the German Federal Ministry for the Environment (BMUV)**.
- **Objective:** It aims to **support partner countries in implementing and ambitiously developing their Nationally Determined Contributions (NDCs)** under the Paris Agreement and achieving goals set by the Convention on Biological Diversity (CBD).
- **Current lead:** Since 2022, the Federal Ministry for Economic Affairs and Climate Action (**BMWK**) **leads the initiative**, working with the Federal Foreign Office and BMUV.
- **Thematic diversity:** It focuses on **four main areas-** Mitigating greenhouse gas emissions, Adapting to the impacts of climate change, Conserving natural carbon sinks (REDD+), and Protecting biological diversity.
- **Consortium-based funding:** Projects are typically implemented by a **mix of NGOs, research institutes, international organizations (like GIZ), and the private sector** to ensure multidisciplinary expertise.
- **Ecosystem-based Adaptation (EbA):** A core feature is **using nature** (e.g., forest restoration, wetland protection) **to help human communities adapt to climate risks like floods and heatwaves**.
- **Innovative financing:** It promotes **high-risk/high-reward financial mechanisms like blended finance, biodiversity credits, and climate insurance** to mobilize private capital.
- **Monitoring and learning:** It requires **rigorous Monitoring, Evaluation, and Learning (MEL) frameworks** to ensure that local successes can be scaled up to national or global policies.

DRUZHBA OIL PIPELINE

The Druzhba oil pipeline is at the center of a geopolitical standoff following a complete halt in flows due to drone attacks, leading Hungary and Slovakia to veto new EU sanctions on Russia.



- The **Druzhba Pipeline** (translating to Friendship in English) is one of the world's longest and largest crude oil pipeline networks.
- Established during the Soviet era, it serves as the primary artery for transporting Russian and Kazakh oil to the industrial heartlands of Central and Eastern Europe.

Located In:

- The network originates in **Almetyevsk, Tatarstan (Russia)**, where it collects oil from Western Siberia, the Urals, and the Caspian Sea.
- It spans approximately **4,000 kilometers**, crossing the Russia-Belarus border before splitting into two massive branches.

States/Countries it Goes Through:

- **Russia:** The starting point and primary source.
- **Belarus:** The central transit hub at Mazyr where the line splits.
- **Northern Branch:** Travels through **Poland** to reach **Germany**.
- **Southern Branch:** Travels through **Ukraine** to supply **Hungary, Slovakia, and the Czech Republic**.

Historical Branches: Connected to **Lithuania and Latvia**

Aim:

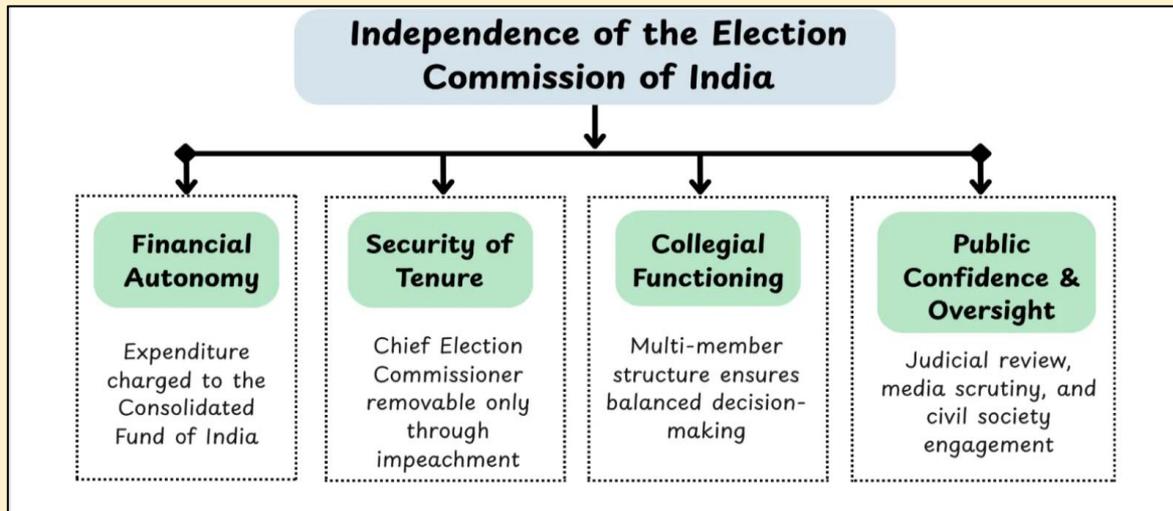
- The pipeline was originally constructed in the 1960s to establish friendly relations through the reliable supply of cheap energy from the Soviet Union to its Eastern European allies.
- Today, its aim remains the provision of energy security to landlocked Central European nations that lack easy access to seaborne oil.

Key Features:

- **Massive Scale:** The system crosses 45 major rivers and over 200 railways and highways.
- **Two-Pronged Distribution:**
 - **Northern Branch:** Supplies refineries in Płock (Poland) and Schwedt (Germany).
 - **Southern Branch:** Connects to the Odesa-Brody pipeline and supplies the Duna (Hungary) and Tisza refineries.
- **Capacity:** At its peak, it pumped over **1 million barrels per day**, accounting for roughly 1% of the total global oil supply.
- **Strategic Bypass:** Russia built the **BPS-2 (Baltic Pipeline System)** to reduce reliance on the Druzhba transit through Belarus and Ukraine.

INDEPENDENCE OF ELECTION COMMISSION

Allegations surrounding electoral roll revisions, debates over the 2023 appointment law, and a proposed motion to remove the Chief Election Commissioner have revived concerns regarding the institutional independence of the Election Commission of India (ECI), a pillar of India's democratic basic structure.



Main Arguments

- **Free and Fair Elections as Basic Structure:** In *Indira Gandhi v. Raj Narain (1975)*, the Supreme Court recognised free and fair elections as part of the Basic Structure. Article 326 guarantees universal adult suffrage, while Article 324 vests the ECI with plenary powers of superintendence, direction and control over elections.
- **Institutional Design under Article 324:** The Constitution provides for a permanent Election Commission comprising the CEC and other Election Commissioners. Since 1993, it has functioned as a multi-member body, validated in *T.N. Seshan v. Union of India (1995)*, ensuring collegial decision-making rather than concentration of power.
- **Safeguards in Removal Process:** Under Article 324(5), the CEC can be removed only through the impeachment-like procedure applicable to Supreme Court judges under Article 124(4), requiring proved misbehaviour or incapacity. This quasi-judicial parliamentary process under the Judges (Inquiry) Act, 1968 ensures natural justice and protection from executive arbitrariness.
- **Appointment Controversy and the 2023 Act:** The Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Office and Terms of Office) Act, 2023 provides for appointment by a committee comprising the Prime Minister, a Union Minister and the Leader of Opposition.
- Critics argue that exclusion of the Chief Justice of India – contrary to the interim arrangement suggested in *Anoop Baranwal v. Union of India (2023)* – may affect perceived neutrality.
- **Recent Electoral Roll Concerns:** Allegations regarding large-scale deletions during Special Intensive Revision (SIR), including deletion of around 65 lakh voters in Bihar, have raised concerns about procedural fairness and transparency, though matters remain sub judice.

Challenges

- Perceived executive dominance in appointments.
- Increasing politicisation of the ECI's decisions.
- Concerns over transparency in electoral roll management.
- Limited financial and administrative autonomy (budget routed through Law Ministry).
- Absence of an independent secretariat insulated from executive control.

Reform Suggestions

Collegium-Based Appointment Mechanism

- The *Law Commission (255th Report, 2015)* recommended a collegium comprising the Prime Minister, Leader of Opposition and Chief Justice of India.
- *Association for Democratic Reforms (ADR)* has consistently advocated inclusion of judicial members to ensure neutrality.
- The Supreme Court in *Anoop Baranwal (2023)* temporarily directed such a composition until Parliament enacts a law.

Independent Secretariat and Financial Autonomy

- The *Second Administrative Reforms Commission (ARC)* recommended that the ECI be provided with an independent secretariat akin to that of the Supreme Court and charged expenditure status under the Consolidated Fund of India.

Equal Removal Protection for ECs

- The *Dinesh Goswami Committee (1990)* and later the *Law Commission* suggested that other Election Commissioners should enjoy the same removal protection as the CEC to prevent hierarchical vulnerability.

Transparent Electoral Roll Audits

- ADR and civil society groups recommend mandatory third-party social audits, public disclosure of deletion criteria, and stronger grievance redressal systems to ensure fairness in voter registration exercises.

Cooling-Off Period and Post-Retirement Restrictions

- Several experts have suggested a statutory cooling-off period to prevent post-retirement appointments, thereby strengthening impartiality.

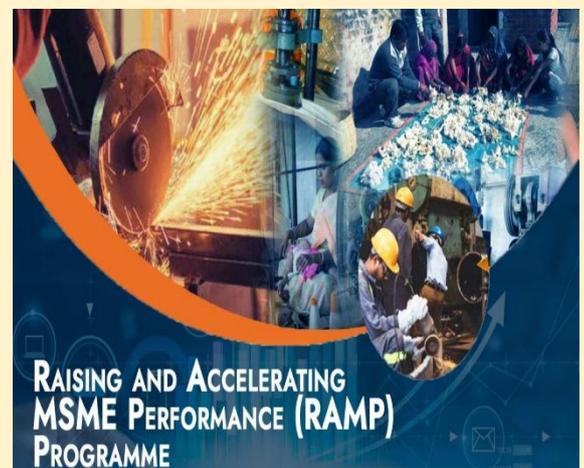
The Election Commission's authority rests not only on constitutional text but on public trust. While Article 324 and impeachment safeguards provide structural autonomy, evolving political contestation necessitates institutional reforms that enhance transparency, financial independence and bipartisan legitimacy. Preserving both the letter and spirit of electoral integrity is indispensable to sustaining India's democratic basic structure.

RAISING AND ACCELERATING MSME PERFORMANCE PROGRAM

Recently, the Ministry of MSME organised the 5th meeting of the National MSME Council to review progress of World Bank-Supported RAMP Programme in New Delhi.

About RAMP Programme:

- **Full form:** RAMP stands for **Raising and Accelerating MSME Performance**.
- **Nodal ministry:** It is implemented by the **Ministry of Micro, Small and Medium Enterprises (MoMSME)**.
- **Apex body:** The **National MSME Council** has been set up by the Ministry to work as an administrative and functional body of the RAMP Programme.



- **Tenure:** The tenure of the scheme is **5 years (FY 2022-23 to FY 2026-27)**.
- **Association:** It is assisted by the **World Bank**.

Key objectives:

- Improving access to **market and credit for MSMEs**
 - Strengthening **institutions and governance** at the central and state levels
 - Improving **centre-state linkages** and partnerships
 - Addressing issues of delayed **payments**

Greening of MSMEs

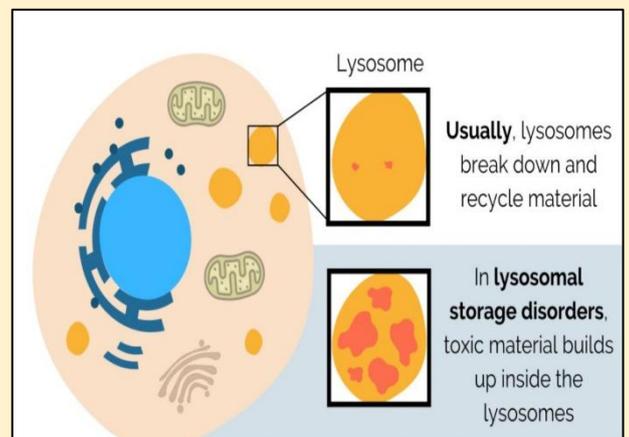
- **Sub schemes under RAMP:**
 - **MSME GIFT Scheme:** MSME Green Investment and Financing for Transformation Scheme **intends to help MSMEs adopt green technology** with interest subvention and credit guarantee support.
 - **MSE SPICE Scheme:** The MSE Scheme for **Promotion and Investment in Circular Economy** aims to support circular economy projects which will be done through credit subsidy and will lead to realising the dream of MSME sector towards zero emissions by 2070.
 - **MSE ODR Scheme:** The MSE Scheme on **Online Dispute Resolution for Delayed Payments** is a first of its kind scheme to synergise legal support with modern IT tools and Artificial Intelligence to address the incidences of delayed payments for Micro and Small Enterprises.

NATIONAL BIOBANK ON LSD'S

Researchers from 28 medical and research institutions across six states and two Union Territories have established India's first government-supported national biobank dedicated to Lysosomal Storage Disorders (LSDs).

The initiative integrates biological samples and detailed clinical, biochemical and genetic data of 530 patients from 15 states.

Funded by the Department of Biotechnology (DBT), the biobank aims to support the development of affordable screening tools and therapies for children affected by these life-threatening genetic disorders.



Understanding Lysosomal Storage Disorders

Lysosomal Storage Disorders are a group of over 70 rare, inherited metabolic conditions caused by the deficiency of specific enzymes. In the absence of these enzymes or their activators, fats and sugars accumulate inside cells, leading to progressive organ damage.

More than 12,000 patients in India are estimated to be living with LSDs. Currently, treatments exist for only a small fraction of rare diseases, and available therapies often cost over Rs 1 crore per patient annually.

Of the 530 patients in the biobank cohort, nearly 60% have died, and only eight are receiving treatment.

The initiative is led by the Foundation for Research in Genetics and Endocrinology (FRIGE), Institute of Human Genetics, Ahmedabad. Published in the Orphanet Journal of Rare Diseases, the biobank covers 8 LSD subgroups across 27 disorders.

Biological samples include genomic DNA from blood, plasma and urine precipitate, processed for enzyme and genetic analysis. The most common conditions recorded are Gaucher disease (70 cases), Tay-Sachs disease (62), Mucopolidosis II/III (44) and Morquio-A syndrome (40).

Research And Therapeutic Development

The biobank operates through a centralised digital platform that stores clinical and genomic data. It is already being utilised by research institutions to develop therapies and screening tools.

Collaborations include work with the Tata Institute for Genetics and Society (TIGS) in Bengaluru to create human stem cell-based disease models. The Institute for Stem Cell Science and Regenerative Medicine (inStem) is developing general therapeutic approaches, while the Centre for DNA Fingerprinting and Diagnostics (CDFD) is working on spectrometry-based screening technologies.

Facts :

- Lysosomal Storage Disorders are inherited metabolic diseases caused by enzyme deficiencies.
- Department of Biotechnology (DBT) funds biomedical research under the Government of India.
- Stem cell-based disease models help study genetic disorders and test therapies.
- Rare diseases often require high-cost enzyme replacement therapies.

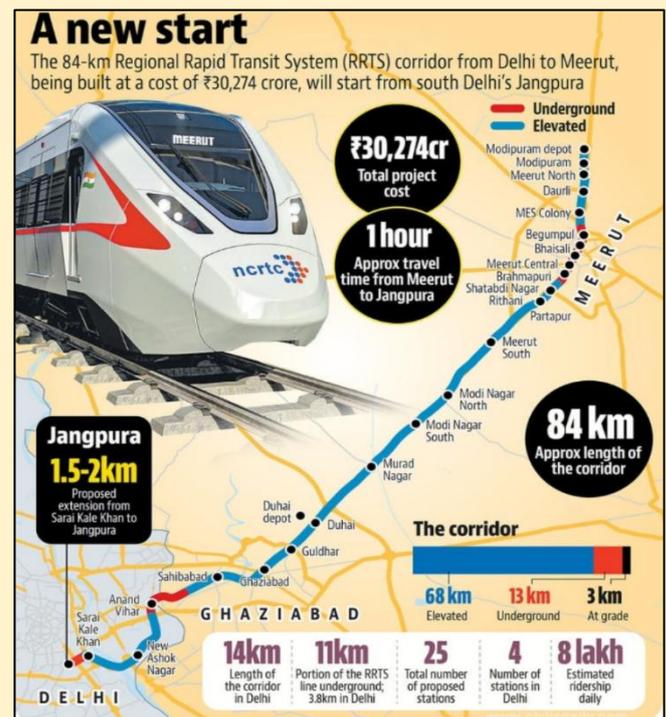
By centralising data and biological samples, the biobank addresses the long-standing gap in coordinated rare disease research in India. It is expected to accelerate early diagnosis, enable indigenous therapy development and reduce treatment costs over time.

The initiative marks a significant step towards strengthening India's rare disease research ecosystem and improving outcomes for affected families.

RRTS CORRIDOR

Prime Minister launched the full Delhi-Meerut RRTS corridor to boost regional connectivity.

- **Project Scale:** 82-km high-speed regional rapid transit system completed.
- **Implementation Agency:** National Capital Region Transport Corporation (NCRTC).
- **Speed Advantage:** Designed for higher average speeds than Metro; suitable for inter-city commuting.
- **Multimodal Integration:** Linked with Indian Railways, Delhi Metro, bus terminals, and key hubs.
- **Economic Impact:** Expected to boost NCR economic integration and reduce housing pressure in Delhi.
- **Environmental Benefit:** Reduction in vehicular traffic and carbon emissions.



Future Plans: Additional RRTS corridors proposed toward Haryana and Rajasthan

Regional Rapid Transit System (RRTS)

What is RRTS?

The **Regional Rapid Transit System (RRTS)** is a high-speed, high-frequency regional rail network designed to connect major urban nodes within the National Capital Region (NCR).

Key Features

- Designed speed: up to 180 km/h (operational speed lower).
- Higher average speed than Metro systems.
- Longer inter-station distance compared to city metros.
- Focused on inter-city/regional commuting.
- Seamless multimodal integration (Metro, Railways, Bus).

Implementation

- Implemented by the **National Capital Region Transport Corporation (NCRTC)**.
- First corridor: **Delhi-Meerut (82 km)**.
- Part of India's broader infrastructure modernization strategy.

Significance

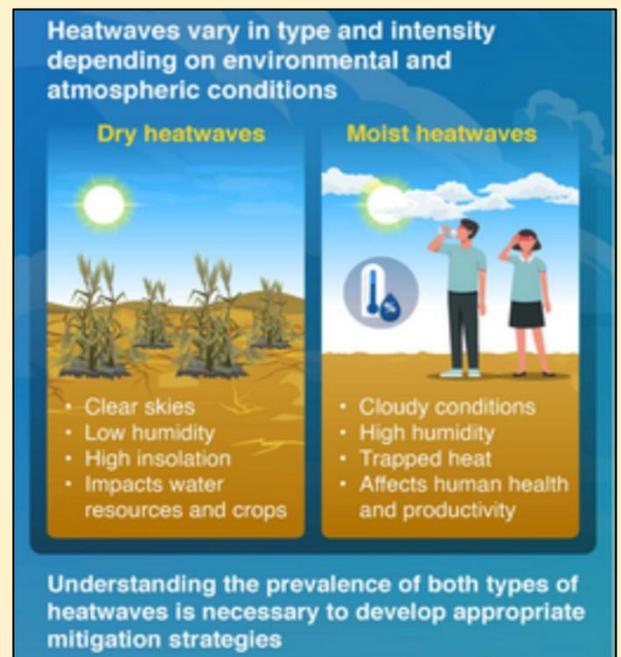
- Reduces congestion and travel time in NCR.
- Promotes transit-oriented development.
- Lowers carbon emissions.
- Boosts regional economic integration.

MOIST HEATWAVES

Research showed that timings of the moist heatwaves are controlled by the active and break periods of the southwest monsoon and can be predicted weeks in advance.

About Moist Heatwave:

- **Trigger:** Moist heatwaves are triggered by a **combined impact of high temperatures and elevated humidity levels** in the atmosphere.
- **Measurement:** The best way to measure the combined effect of humidity and temperature is '**wet bulb temperature**'.
- **Wet bulb temperature:** Wet bulb temperature is the **lowest temperature to which air can be cooled by the evaporation of water into the air at constant pressure**. This is a process happening on human skin when people sweat.



- **Accepted level:** The globally accepted level for wet bulb temperature that forms the **limit of human survivability** is 35°C.
 - **IMD Criteria for Heatwaves:** While the India Meteorological Department (IMD) primarily uses temperature thresholds, moist heat is increasingly factored into "Heat Index" warnings:

- **Plains:** Max temperature $\geq 40^{\circ}\text{C}$.
- **Coastal Regions:** Max temperature $\geq 37^{\circ}\text{C}$.
- **Hilly Regions:** Max temperature $\geq 30^{\circ}\text{C}$.
- **Impact of Moist Heatwaves on humans:**
 - When air is already humid, sweat cannot evaporate from skin, leaving the body unable to cool itself. This can lead to **heat exhaustion and fatal heatstroke** within hours.
 - It is because high humidity impairs evaporation, **limiting the human body's ability to dissipate metabolic heat** and regulate core temperature.
- In such circumstances, the physiological strain on the **human body intensifies, exacerbating the risks of cardiovascular and respiratory illnesses.**
 - A **thermoregulatory failure** can lead to hyperthermia, heat exhaustion, and fatal heatstroke in extreme cases.

CHICORY

Recently, FSSAI gave an advisory related to Chicory, whose content must be prominently displayed on front of coffee powder packs from 1 July.



About Chicory:

- **Nature:** It is a **blue-flowered, woody perennial herbaceous plant** mainly cultivated in temperate regions worldwide.
- **Family:** Chicory (*Cichorium intybus*) is a plant belonging to the **Asteraceae family**.
- **Distribution:** It is native to **Europe and Asia**; in India, it is primarily cultivated in **Uttar Pradesh and Gujarat**.
- **Significance:** There are several varieties of the chicory plant, known differently globally due to its **numerous medicinal, culinary, and nutritional qualities**.
- **Uniqueness:** It contains **Inulin, a soluble fiber and prebiotic** that acts as a natural sweetener. It is naturally **caffeine-free and rich in beta-carotene**.
 - **Additive in coffee:** It is a popular additive that provides a **darker colour and an earthy taste to the beverage**. It is significantly less expensive than high-quality coffee.

- **Existing rules:** Previous FSSAI regulations (2011) stipulated that a coffee-chicory mixture must contain at least 51% coffee.
 - **Legal status:** Under the Coffee Act 1942, chicory is **not defined as coffee** because it does not come from a rubiaceous plant.
- **Other uses:**
 - **Culinary:** Leaves are used as **salad greens** (e.g., Radicchio, Belgian endive).
 - **Medicinal:** Used in **traditional medicine (folk remedies)** for liver health, digestion, and as a mild laxative.
 - **Agricultural:** Grown as a **forage crop for livestock** (especially sheep) due to its nutrient density.

KOLE WETLANDS

A scientific study in Kerala's Kole wetlands has led to the discovery of four new species of pygmy grasshoppers, highlighting the region's rich but understudied biodiversity.



- Four new species of pygmy grasshoppers (family Tetrigidae) were discovered in Kole wetlands.
- The study underscores the ecological significance of this Ramsar-listed wetland ecosystem.
- Pygmy grasshoppers are important bio-indicators of wetland health.
- The findings reveal high microhabitat diversity within agricultural-wetland landscapes.
- Researchers emphasised the need for long-term taxonomic and ecological documentation.
- The discovery strengthens the case for conservation of Kole wetlands.
- It highlights that even human-modified wetlands can harbour undocumented species diversity.

Kole Wetlands

- Kole Wetlands is a large freshwater wetland ecosystem located in Thrissur and Malappuram districts of Kerala.
- The term “Kole” refers to bumper yield, indicating its high agricultural productivity.
- It is a below sea-level wetland system, seasonally flooded during the monsoon.
- The area supports extensive paddy cultivation through controlled water management.
- It was designated as a Ramsar Site in 2022 due to its ecological importance.
- The wetland serves as a crucial habitat for migratory and resident birds.
- It plays an important role in flood regulation, groundwater recharge and carbon sequestration.
- Kole wetlands also support rich biodiversity, including fish, amphibians and recently discovered pygmy grasshopper species.

SAYYAD-3G NAVAL AIR-DEFENCE MISSILE

Iran has successfully test-fired the new Sayyad-3G naval air-defence missile during naval drills in the strategic Strait of Hormuz, signalling enhanced maritime defence capabilities amid tensions with the U.S. and Western forces.

- Iran tested the **Sea-based Sayyad-3G** naval air-defence missile in drills in the Strait of Hormuz.
- The missile was launched from the **Shahid Sayyad Shirazi** warship using a **vertical launch system**.
- Sayyad-3G is a maritime adaptation of Iran’s long-range Sayyad air-defence family, expanding naval air defence range ~150 km.



- It is designed to intercept aircraft, UAVs and other aerial threats to naval vessels.
- The test comes amid regional tensions and increased U.S. naval presence near Iranian waters.
- Iran claims the system strengthens its **sea-denial strategy** and protects its navy against foreign threats.
- Western and Israeli militaries are monitoring the development closely due to strategic implications.

Sayyad-3G Missile – Key Features

- It is a **naval surface-to-air missile (SAM)** developed by Iran.
- Designed for **ship-based vertical launch systems (VLS)**.
- Primarily meant to intercept **aircraft, UAVs and other aerial threats**.
- Reported operational range of around **150 km (approx.)**.
- Part of the broader **Sayyad air-defence missile family**.
- Enhances Iran's **maritime air defence and sea-denial capability**.
- Tested in naval drills in the **Strait of Hormuz**, a strategically vital chokepoint.

ALARA & LNT PRINCIPLES

The U.S. Department of Energy eliminated the ALARA principle, triggering debate over global radiation safety standards.

- **ALARA Principle:** Operational philosophy in radiation protection that mandates exposure be kept as low as reasonably achievable, balancing safety, cost, and feasibility.

✔ ALARA stands for "as low as reasonably achievable", which is the operational philosophy of radiation protection.

- 'Reasonably' is the most important condition.
- The philosophy balances safety with feasibility, cost, and societal need.
- It requires that radiation exposure be reduced as much as possible, taking into account technology, cost, and social needs.

✔ **Aim:** To reduce unnecessary exposure through engineering controls and to encourage a safety culture.

✔ It is enshrined in the fundamental principles of the International Commission on Radiation Protection (ICRP).



LINEAR NO-THRESHOLD (LNT) MODEL

- ✔ A risk estimation framework that says any amount of ionising radiation, no matter how small, carries some risk of causing harm, especially cancer.
- ✔ In other words, there is no threshold below which radiation is considered completely risk-free, and the risk increases linearly with dose.

- **LNT Model:** Assumes a linear relationship between radiation dose and cancer risk, with no safe threshold.
- **Policy Shift:** U.S. DOE removed ALARA from its regulatory directives in January, marking a significant departure from long-standing safety norms.
- **Scientific Debate:** Some experts argue low-dose radiation risks may be overstated; others stress lack of conclusive evidence to replace LNT.

- **International Implications:** Global bodies like ICRP and WHO continue to rely on LNT, creating possible divergence in regulatory approaches.
- **Concerns Raised:** Potential weakening of worker protection, regulatory clarity, and public trust.
- **Broader Issue:** Balancing innovation in nuclear energy with precautionary safety frameworks.

Learning Corner:

- **ALARA Principle (As Low As Reasonably Achievable)**
- A radiation protection principle used in nuclear energy, medical radiology, and research.
- It requires that radiation exposure be kept **as low as reasonably achievable**, considering economic and social factors.
- It does not mean zero exposure, but minimisation below prescribed safety limits.
- It is based on the precautionary approach, assuming some level of risk even at low doses.
- **LNT Model (Linear No-Threshold Model)**
- A scientific model used to assess radiation risk.
- It assumes that the risk of cancer increases linearly with radiation dose.
- It also assumes there is **no safe threshold**, meaning even very small doses carry some risk.
- It forms the theoretical basis for radiation safety standards worldwide

UNESCO ASIA-PACIFIC AWARDS FOR CULTURAL HERITAGE CONSERVATION

The Our Lady of Grace Cathedral, Vasai (Maharashtra) has won the Award of Merit at the 2025 UNESCO Asia-Pacific Awards for Cultural Heritage Conservation.



About 2025 UNESCO Asia-Pacific Awards for Cultural Heritage Conservation:

What it is?

- A prestigious UNESCO initiative that recognises **outstanding heritage conservation projects** across the Asia-Pacific region.
- It honours restoration efforts that combine technical excellence with cultural authenticity and community participation.

Established in:

- **2000**, by UNESCO to promote best practices in cultural heritage preservation across Asia and the Pacific.

Aim:

- To encourage high-quality conservation of historic sites while maintaining cultural integrity and sustainability.
- To promote community participation and adaptive reuse of heritage structures for long-term preservation.

Key Features:

- Recognises projects based on understanding of place, technical achievement, sustainability, and impact.
- Open to private sector and public-private partnership conservation initiatives.
- Covers heritage types such as historic buildings, towns, archaeological sites, cultural landscapes and vernacular architecture.
- Projects must generally be completed within the last ten years to qualify.
- Has honoured 300+ projects across 27 countries, shaping regional conservation standards.

About Vasai Cathedral (Our Lady of Grace Cathedral):

What it is?

- A **16th-century Catholic cathedral** located in **Papdy village, Vasai (Maharashtra)**, representing early Portuguese colonial architecture in India.

History:

- Built around **475 years ago** during Portuguese rule on India's western coast.
- Constructed using stone and mud mortar, without modern cement.
- Recently restored (2023-24) through a **community-funded conservation initiative** costing about ₹4.5 crore.

Key Features:

- Reflects **Portuguese ecclesiastical architecture** with stone masonry and traditional craftsmanship.
- Interior restored using hand-carved liturgical elements and authentic materials.
- Includes restored roof, façade, corridors, colonnade and bell tower.
- Serves as a **living place of worship**, preserving both tangible and intangible heritage.

NATIONAL MONETISATION PIPELINE 2.0

Union Finance Minister has launched the National Monetisation Pipeline 2.0 (NMP 2.0) to accelerate infrastructure financing through asset monetisation.



Govt to monetise roads, railway stations, passenger trains, airports, warehousing assets of CPSEs, etc.

Launched by Govt of India in August 2021, pipeline developed by the NITI Aayog.

Objective: To unlock the value of investments in brownfield public sector assets.

- **NMP 2.0** is the second phase of India's national asset monetisation programme that provides a **medium-term roadmap for monetising operational public infrastructure assets**.
- It focuses on unlocking value from existing brownfield assets to generate resources for new infrastructure creation and capital expenditure.

Ministry / Implementing Agency:

- Developed by NITI Aayog in consultation with infrastructure line ministries.
- Implemented under the guidance of the **Ministry of Finance** and monitored by the Core Group of Secretaries on Asset Monetisation (CGAM).

Aim:

- To recycle public assets and mobilise funds for fresh infrastructure development without increasing fiscal burden.
- To provide visibility and investment opportunities for private sector participation in infrastructure.

Key Features:

- **Total Monetisation Potential:** ₹16.72 lakh crore for FY 2026–2030, including ₹5.8 lakh crore private investment.
- **Guidance Framework:** Structured as a methodology and roadmap document for ministries and investors.
- **Multiple Monetisation Models:** PPP concessions, InvITs, securitisation of cash flows, strategic auctions, and partial divestments.
- **Revenue Allocation Mechanism:** Proceeds flow to Consolidated Fund of India, PSUs, State Consolidated Funds, or direct private investments.
- **Sector-Wide Coverage:** Includes highways, railways, power, ports, coal, mining, telecom, aviation, tourism and urban infrastructure.
- **Process Standardisation:** Emphasis on simplification and time-bound execution based on lessons from NMP 1.0.
- **Monitoring Mechanism:** Continuous oversight by empowered inter-ministerial group led by Cabinet Secretary.

Top 5 Sectoral Shares (FY 2026–30):

1. Highways, MMLPs & Ropeways – 26% (₹4.42 lakh crore)
2. Power Sector – 17% (₹2.76 lakh crore)
3. Railways – 16% (₹2.62 lakh crore)
4. Ports – 16% (₹2.63 lakh crore)
5. Coal – 13% (₹2.16 lakh crore)

Significance:

- Promotes asset recycling, enabling reinvestment into new infrastructure projects.
- Reduces dependence on direct budgetary expenditure for CAPEX.
- Strengthens PPP ecosystem and attracts long-term private investment.

TAKESHIMA/DOKDO ISLANDS

South Korea lodged a firm diplomatic protest against Japan's Takeshima Day, an annual event held in Shimane Prefecture to assert sovereignty over the disputed islets.



About Takeshima/Dokdo Islands

What it is?

- The territory is a cluster of small, rocky outcroppings located in the **Sea of Japan** (referred to as the **East Sea** by South Korea).
- **Composition:** It consists of two main volcanic islets – **Dongdo** (East Island) and **Seodo** (West Island) – along with roughly 30 to 90 smaller rocks and reefs.
- **Geographical Position:**
 - The islands lie roughly equidistant between the two nations but are physically closer to the South Korean island of **Ulleungdo** (approx. 87 km) than to Japan's **Oki Islands** (approx. 157 km).

History and Origin:

- **Ancient Records:** South Korea traces its claim back to the 6th-century **Silla Kingdom**, citing various historical maps and documents (like the Sejong Sillok Jiriji) that describe the islets as part of Korean territory.
- **1905 Annexation:** Japan officially incorporated the islands into Shimane Prefecture in 1905, declaring them terra nullius (nobody's land) during the Russo-Japanese War. South Korea views this as an illegal act of colonial aggression.
- **Post-WWII (1945-1954):** Following Japan's defeat in 1945, the islands were placed under Allied control. In 1954, South Korea established a permanent coast guard presence on the islands, effectively regaining control after the end of Japanese colonial rule.

Features:

- **Terrain:** Volcanic rocks formed in the Cenozoic era. They feature steep cliffs, numerous sea caves, and a harsh, humid climate.
- **Fisheries:** The surrounding waters are a Goldilocks zone where warm and cold ocean currents meet, creating one of the world's most fertile fishing grounds for squid, pollock, and cod.
- **Energy Potential:** Recent geological surveys suggest the seabed may hold **600 million tons of gas hydrates** (often called fire ice).
 - This natural gas resource is estimated to be worth nearly **\$10 billion annually**, making the islands a strategic energy asset.

Current Status:

- **De Facto Control:** South Korea maintains **effective control** over the islands, with a small detachment of police, lighthouse keepers, and a handful of residents.
- **Legal Stance:** South Korea refuses to take the matter to the **International Court of Justice (ICJ)**, arguing that there is no dispute to settle as the islands are an integral part of their sovereign territory.
- Japan continues to claim the islands as an inherent part of its territory, hosting Takeshima Day every February 22nd.

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