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1. Cabinet Approves Rationalisation of Royalty Rates for Critical Minerals: Graphite, Caesium, Rubidium and Zirconium

1. Key Decision and Revised Royalty Rates

- The **Union Cabinet**, chaired by **Prime Minister Shri Narendra Modi**, approved the rationalisation and specification of royalty rates for four critical minerals — **Graphite, Caesium, Rubidium and Zirconium**.
- **Revised Royalty Structure:**
 - *Caesium*: 2% of Average Sale Price (ASP) on Caesium metal contained in ore.
 - *Rubidium*: 2% of ASP on Rubidium metal contained in ore.
 - *Zirconium*: 1% of ASP on Zirconium metal contained in ore.
 - *Graphite*: 2% ($\geq 80\%$ fixed carbon) and 4% ($< 80\%$ fixed carbon) on ad valorem basis.
- The move replaces the earlier **₹/tonne rate** for Graphite with an **ad valorem system**, aligning it with other critical minerals.



2. Objective and Significance

- The decision aims to **promote the auction and development of mineral blocks** containing these strategic minerals, unlocking their economic potential.
- It is expected to **boost domestic production**, reduce import dependency, mitigate **supply chain vulnerabilities**, and generate employment.
- These minerals are crucial for **green energy technologies, EV batteries, nuclear applications, and high-tech electronics**.

3. Critical Minerals and Energy Transition Context

- **Critical minerals** are elements essential for clean energy technologies, electronics, defence, and advanced manufacturing but with **high supply risk** due to limited global sources.
- India imports around **60% of its Graphite** demand despite possessing reserves; 9 mines are operational, and 27 new Graphite blocks have been auctioned.
- **Zirconium** is vital for **nuclear energy and aerospace**, **Caesium** for **atomic clocks and GPS**, and **Rubidium** for **telecom and night vision devices**—all indispensable to India's **high-tech and defence sectors**.

4. Legal and Policy Framework

- The revision is made under the **Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act)**.
- **Section 9 of MMDR Act** empowers the Central Government to fix royalty rates for minerals.
- **Graphite and Zirconium** are included among the **24 Critical and Strategic Minerals** under the Act.



- This move aligns with the **National Mineral Policy, 2019**, which emphasizes exploration, auction-based allocation, and sustainable mining for critical minerals.

5. Broader Economic and Strategic Implications

- The decision complements India's broader initiatives like the **Critical Minerals Mission, Atmanirbhar Bharat, and Energy Transition Goals**.
- It enhances **investor confidence** by providing clarity in royalty structure and encourages participation in ongoing **critical mineral block auctions** (6th tranche issued on 16 September 2025).
- By strengthening domestic value chains, it supports **Make in India** and **India's global competitiveness** in emerging technologies.

6. Key Definitions for Conceptual Clarity

- **Royalty (in mining):** A payment made by mining leaseholders to the government for extracting minerals, typically based on quantity or value of production.
- **Ad valorem basis:** A system where royalty is charged as a percentage of the market value (ASP) of the mineral, allowing adjustment with price fluctuations.
- **Average Sale Price (ASP):** The weighted average price of a mineral, periodically notified by the Indian Bureau of Mines (IBM).

Conclusion

The Cabinet's approval marks a **strategic step toward resource security and energy transition**, positioning India to exploit its mineral potential in a sustainable and market-aligned manner. It reflects a proactive approach to critical mineral management essential for technological and industrial self-reliance.

UPSC Relevance:

- **Prelims:** MMDR Act, 1957; National Mineral Policy, 2019; Critical Minerals List; Graphite and Zirconium uses.
- **Mains (GS Paper 3 – Economy, Environment, Technology):**
 - *Topic:* "Liberalization of the mineral sector and its role in energy transition."
 - *Keywords:* Critical Minerals, Royalty Rationalization, Energy Transition, Atmanirbhar Bharat, Ad Valorem System.
 - *Linkage:* Resource Governance → Industrial Policy → Sustainable Growth → Strategic Autonomy.

2. Cabinet Approves Export Promotion Mission (EPM): Strengthening India's Export Ecosystem

1. Key Decision and Objective

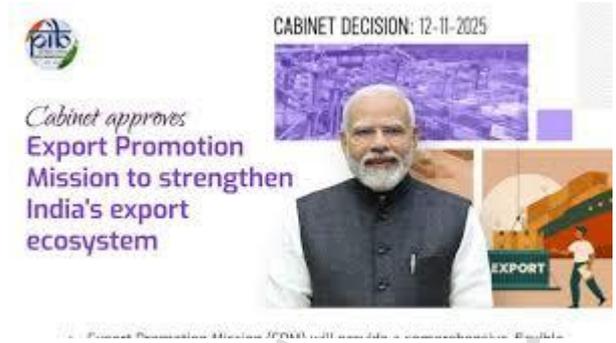
- The **Union Cabinet**, chaired by **Prime Minister Shri Narendra Modi**, approved the **Export Promotion Mission (EPM)** — a flagship initiative announced in the **Union Budget 2025–26** with a total outlay of **₹25,060 crore (FY 2025–26 to FY 2030–31)**.
- The Mission aims to **consolidate fragmented export schemes** into a single, **digitally driven and outcome-based framework** to enhance India's **export competitiveness**, particularly for **MSMEs, first-time exporters, and labour-intensive sectors**.



- It seeks to make India's export ecosystem more **resilient, inclusive, and globally competitive**, aligning with the **Atmanirbhar Bharat** and **Viksit Bharat@2047** vision.

2. Structure and Implementation Mechanism

- The Mission comprises **two integrated sub-schemes**:
 - **(i) NIRYAT PRO TSAHAN**: Focuses on **financial enablers** — affordable trade finance for MSMEs through **interest subvention, export factoring, collateral guarantees, credit enhancement, and e-commerce export credit cards**.
 - **(ii) NIRYAT DISHA**: Focuses on **non-financial enablers** — export quality compliance, **international branding, logistics support, participation in trade fairs, and trade intelligence and capacity building**.
- The **Directorate General of Foreign Trade (DGFT)** will act as the **implementing agency**, operating through a **dedicated digital platform** linked to existing systems like **ICEGATE, RBI's export data, and GSTN** for transparency and efficiency.



3. Institutional Framework and Convergence

- EPM integrates efforts of multiple ministries — **Department of Commerce, Ministry of MSME, Ministry of Finance, and state governments**, along with **Export Promotion Councils, Commodity Boards, and financial institutions**.
- It **merges existing schemes** such as the **Interest Equalisation Scheme (IES)** and **Market Access Initiative (MAI)** under one adaptive structure, ensuring **policy coherence and ease of access** for exporters.
- This marks a major step in achieving **“Whole-of-Government” coordination** in trade policy formulation and execution.

4. Addressing Structural Challenges in Exports

- EPM is designed to overcome persistent constraints in India's export sector, including:
 - Limited and **costly trade finance** for MSMEs.
 - **High cost of compliance** with global standards and certifications.
 - **Weak export branding** and fragmented market access.
 - **Logistical inefficiencies** in hinterland and low-export-intensity regions.
- Priority sectors for support include **textiles, leather, gems & jewellery, engineering goods, and marine products** — sectors affected by recent **global tariff escalations**.

5. Expected Outcomes and Strategic Impact

- Facilitate **affordable and timely finance** for MSMEs and small exporters.
- Enhance **export quality, branding, and certification capacity** to meet global standards.
- Improve **market access** for Indian products through trade promotion and logistics support.



- Boost **exports from non-traditional districts**, supporting **Districts as Export Hubs (DEH)** initiative.
- Create **employment across manufacturing, logistics, warehousing, and allied services**, contributing to **inclusive economic growth**.
- Strengthen India's position in **global value chains (GVCs)** by improving competitiveness and reducing export transaction costs.

6. Legal, Policy, and Constitutional Context

- The EPM aligns with **Article 301–307 (Freedom of Trade, Commerce and Intercourse)** and **Entry 41 (Trade and Commerce with Foreign Countries)** under the **Union List (Seventh Schedule)**.
- It operates within the legal framework of the **Foreign Trade (Development and Regulation) Act, 1992**, empowering the government to promote exports and regulate trade policy.
- It is consistent with the **Foreign Trade Policy (2023–2028)**, **National Logistics Policy (2022)**, and **National Trade Facilitation Action Plan**.

7. Key Definitions for Conceptual Clarity

- **Export Promotion:** Policy interventions aimed at increasing a country's exports through financial incentives, market access, and trade facilitation measures.
- **Ad valorem:** Latin for “according to value,” used for calculating duties or royalties as a percentage of product value.
- **Trade Finance:** Short-term credit and financial instruments facilitating import-export transactions by mitigating payment and delivery risks.
- **Interest Subvention:** Government subsidy to lower interest rates on loans to exporters, making credit more affordable.

Conclusion

The **Export Promotion Mission** represents a transformative policy shift toward a **unified, digital, and adaptive export promotion framework**. By integrating financial and non-financial support for MSMEs and exporters, it addresses structural bottlenecks and aligns India's export ecosystem with **global trade realities**. It will be crucial for achieving **\$2 trillion export target by 2030** and realizing India's vision of becoming a **major global manufacturing and export hub**.

UPSC Relevance:

- **Prelims:** Export Promotion Mission (EPM), DGFT, Interest Equalisation Scheme, Market Access Initiative, Foreign Trade Policy (2023–28).
- **Mains (GS Paper 3 – Economy, Inclusive Growth, Infrastructure):**
 - *Topic:* “Measures to improve export competitiveness and MSME integration into global value chains.”
 - *Keywords:* NIRYAT PROTSAHAN, NIRYAT DISHA, Trade Finance, MSME Export Support, Digital Trade Facilitation, Atmanirbhar Bharat.
 - *Linkages:* Economic Reforms → MSME Growth → Employment Generation → Global Competitiveness.



3. Government to Promote Tribal Products in International Markets: From “Van Dhan” to “Vyapar Dhan”

1. Key Announcement and Objective

- The **Union Minister of Commerce & Industry, Shri Piyush Goyal**, announced a comprehensive initiative to promote **tribal products and crafts in international markets**, marking a transformation from “*Van Dhan to Vyapar Dhan.*”
- The initiative aims to integrate tribal enterprises into **global value chains** through e-commerce platforms, export promotion, and market access support.
- It focuses on ensuring **economic empowerment of tribal communities**, enhancing their **visibility, incomes, and self-reliance**, aligning with the goals of **Atmanirbhar Bharat and Viksit Bharat @2047**.
- The event, held during **Janjatiya Gaurav Varsh** to commemorate **Birsa Munda’s 150th birth anniversary**, symbolised the government’s commitment to inclusive and sustainable development.

2. Institutional Framework and Strategic Measures

- The initiative is led by the **Department for Promotion of Industry and Internal Trade (DPIIT)** under the **Ministry of Commerce and Industry**, in collaboration with the **Ministry of Tribal Affairs** and **Ministry of Culture**.
- Key measures include:
 - Integration of tribal products into **international and domestic e-commerce platforms**.
 - Establishment of **international warehouses** and **display hubs** for tribal products.
 - Strengthening **export promotion** through schemes under development by the **Department of Commerce**.
- The **budget allocation for the Ministry of Tribal Affairs** has been **increased by 50%**, and under the **PM-Janman Yojana**, **50 lakh families** from **Particularly Vulnerable Tribal Groups (PVTGs)** have benefitted with disbursements of **₹24,000 crore**.
- Over **3,900 Van Dhan Kendras** have empowered **12 lakh tribal members**, promoting community-based value addition and entrepreneurship.



3. Major Initiatives and Announcements at the Conclave

- **(i) Gramya Yuva Arth Niti (GYAN) Lab:** Launched in collaboration with **IIT Bombay** and **PRAYOGI Foundation**, it will design policy models for **tribal entrepreneurship and micro-equity incubation**, testing scalable rural enterprise frameworks.
- **(ii) Tribal Affairs Grand Challenge:** Jointly launched by the **Ministry of Tribal Affairs, DPIIT**, and **Startup India** to fund and mentor **high-impact tribal innovations**.
- **(iii) Roots to Rise Pitching Platform:** Connected **250+ tribal enterprises, 150 exhibitors, and 100 start-ups** with **investors and corporates**; resulted in **₹10 crore investment commitments**, creating **1,500 direct and 10,000+ indirect jobs**.



- **(iv) GI Certificate Distribution:** Recognition of tribal products like **Apatani Textiles (Arunachal Pradesh)**, **Bodo Aronai (Assam)**, and **Bedu Ghee (Uttarakhand)**, enhancing **cultural branding and global identity**.
- **(v) Government e-Marketplace (GeM):** Over **60 tribal enterprises registered**, receiving **50+ procurement inquiries**, linking artisans directly with institutional buyers.

4. Legal, Constitutional, and Policy Context

- The initiative aligns with **Article 46** of the Constitution, directing the State to promote the **educational and economic interests of Scheduled Tribes** and protect them from social injustices.
- It complements the **Tribal Sub-Plan (TSP)**, **National Tribal Policy (Draft)**, and **Schemes under TRIFED** such as **Van Dhan Vikas Karyakram**.
- **Geographical Indications (GI) Act, 1999:** The **fee reduction by 80% (₹5,000 to ₹1,000)** for GI registration will enhance tribal artisans' ability to **protect traditional knowledge and secure intellectual property rights**.
- **Foreign Trade (Development and Regulation) Act, 1992** enables export facilitation for tribal products under **DGFT-led trade missions**.
- The initiative supports **inclusive trade policy** under the **Foreign Trade Policy (2023–2028)**, emphasising “Local Goes Global.”

5. Significance and Expected Outcomes

- **Economic Empowerment:** Promotes income diversification for tribal artisans through international trade opportunities.
- **Cultural Preservation:** Safeguards indigenous crafts, traditions, and heritage through **GI tagging and branding**.
- **Enterprise Development:** Encourages entrepreneurship among **tribal youth and women**, backed by innovation labs like **GYAN**.
- **Market Integration:** Connects remote producers to **global markets, digital commerce, and government procurement platforms**.
- **Employment Generation:** Expands livelihood opportunities across tribal regions through value addition, logistics, and exports.
- **Sustainability and Inclusivity:** Embeds **tribal value chains** in India's sustainable growth framework, aligning with **SDG 8 (Decent Work and Economic Growth)** and **SDG 10 (Reduced Inequalities)**.

6. Key Definitions for Conceptual Clarity

- **Van Dhan:** Refers to forest-based wealth — products and skills derived from non-timber forest produce (NTFP) collected by tribal communities.
- **Vyapar Dhan:** Concept of transforming forest wealth into trade wealth by enabling market access and enterprise development.
- **Geographical Indication (GI):** A legal tag under the **GI Act, 1999**, identifying goods as originating from a specific location, possessing unique qualities or reputation due to that origin.



- **PVTGs: *Particularly Vulnerable Tribal Groups*** — the most marginalized tribal communities recognized by the Government of India for targeted welfare support.

Conclusion

The government's vision of transforming “**Van Dhan to Vyapar Dhan**” reflects a paradigm shift from welfare to wealth creation for tribal communities. By integrating traditional skills with modern commerce, digital platforms, and global markets, India aims to build **sustainable tribal value chains**, ensuring both **cultural preservation and economic empowerment**. The initiative signifies a holistic approach — blending **social justice, trade promotion, and inclusive development** — towards realizing the goal of **Viksit Bharat @2047**.

UPSC Relevance:

- **Prelims:** Van Dhan Vikas Karyakram, TRIFED, GI Act 1999, PM-Janman Yojana, PVTGs, DPIIT, GYAN Lab.
- **Mains (GS Paper 1 – Society, GS Paper 3 – Economy & Inclusive Growth):**
 - *Topics:* Tribal Empowerment through Trade, Inclusive Economic Development, Local to Global Initiatives.
 - *Keywords:* Van Dhan to Vyapar Dhan, Tribal Entrepreneurship, GI Tag, Local Goes Global, Sustainable Livelihoods, Atmanirbhar Bharat.
 - *Linkages:* Social Justice → Indigenous Empowerment → Market Inclusion → Sustainable Growth.

4. Ministry of Culture Showcases India's Tribal Art, Literature and Creativity at Tribal Business Conclave 2025

1. Key Event and Objective

- The **Ministry of Culture** played a central role in the **Tribal Business Conclave 2025**, held at **Yashobhoomi, New Delhi**, as part of the **Janjatiya Gaurav Varsh** celebrations marking the **150th Birth Anniversary of Bhagwan Birsa Munda**.
- The event celebrated **tribal art, literature, and creativity**, integrating them with enterprise and innovation to strengthen India's **creative economy and cultural entrepreneurship**.
- Organized jointly by the **Ministry of Tribal Affairs, DPIIT (Ministry of Commerce & Industry)**, and **Ministry of Culture**, the Conclave aligned with the national vision of **Viksit Bharat @2047** and the spirit of “*Cultural Empowerment through Economic Inclusion.*”



2. Theme Pavilion and Institutional Participation

- The **Theme Pavilion**, curated by the Ministry of Culture, served as a confluence of India's **indigenous art, language, and heritage**, featuring three premier cultural institutions:
 - **Lalit Kala Akademi:** Displayed **tribal and folk art, sculptures, and installations**, including a bust of **Birsa Munda**, symbolizing tribal pride and ecological harmony.



- **Sahitya Akademi:** Exhibited **tribal literature, oral traditions, and translated works**, promoting preservation of **tribal languages and literary diversity**.
- **Centre for Cultural Resources and Training (CCRT):** Showcased **craft demonstrations, traditional art forms, and creative pedagogy**, emphasizing **community skill development and sustainable cultural livelihoods**.
- The Pavilion embodied the message of **“Heritage to Enterprise”** — transforming cultural capital into economic opportunity.

3. Panel Discussion: ‘Tribal Heritage to Enterprise’

- A major highlight was the panel discussion titled **“Tribal Heritage to Enterprise: Promoting Sustainable Entrepreneurship”**, moderated by **Dr. Rahul Kumar (CCRT)**.
- Eminent participants included **Dr. Sachchidanand Joshi (IGNCA)**, **Prof. S.M. Patnaik (University of Delhi)**, **Mahadeo Toppo (Sahitya Akademi)**, **Ranendra Singh (Tribal Research Institute)**, **Kartik Gaggar (Rooftop)**, and **Warli artist Rajesh Vangad**.
- Key insights:
 - *Language Preservation:* Loss of script leads to erosion of cultural meaning (Dr. Joshi).
 - *Narrative Approach:* Intangible heritage must be sustained through storytelling and community participation (Prof. Patnaik).
 - *Dynamic Culture:* Tribal languages and art must evolve as **living creative tools** (Ranendra, Toppo).
 - *Youth Engagement:* Need to make tribal art accessible to younger generations (Gaggar).
 - *Artistic Expression:* Warli art as **“a visual language of storytelling”** (Vangad).
- The session emphasized **culture as a driver of sustainable livelihoods and inclusive growth**.

4. Cultural Showcase and Symbolism

- The Ministry curated diverse **tribal dance, music, and theatre performances**, celebrating unity in diversity through **regional traditions**.
- The concluding performance, **“Lok Dhvani: Tribal Renditions in Motion and Music,”** portrayed harmony between rhythm, movement, and collective identity, symbolizing India’s **tribal resilience and creativity**.
- The cultural segment reflected the role of **performing arts as both cultural preservation and socio-economic empowerment** tools for tribal communities.

5. Policy, Constitutional, and Legal Context

- The initiative aligns with **Article 46** of the Indian Constitution, which directs the State to promote the **economic and educational interests of Scheduled Tribes** and protect them from exploitation.
- Supported by the **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006**, ensuring cultural and livelihood rights of indigenous people.
- It complements national policies such as the **National Tribal Policy (Draft)**, **National Cultural Policy (2023)**, and **UNESCO’s Convention on Intangible Cultural Heritage (2003)**, to which India is a signatory.



- The Ministry's efforts support the **Creative Economy Vision** under **Amrit Kaal**, integrating **culture, enterprise, and sustainability** as pillars of national development.

6. Key Definitions for Conceptual Clarity

- **Intangible Cultural Heritage (ICH):** Traditions, performing arts, knowledge, and craftsmanship that communities recognize as part of their cultural identity.
- **Creative Economy:** Economic activities based on creativity, skill, and talent that generate employment and cultural value (e.g., art, literature, music, crafts).
- **Tribal Literature:** Oral or written narratives expressing indigenous perspectives, myths, folklore, and socio-cultural realities of tribal communities.
- **Cultural Entrepreneurship:** The process of transforming cultural resources into sustainable business ventures that preserve identity while generating livelihoods.

Conclusion

The Ministry of Culture's participation in the **Tribal Business Conclave 2025** reflects India's evolving vision of culture as a **developmental resource** — linking **heritage with innovation, art with enterprise, and tradition with technology**. By empowering tribal artists and writers through platforms like the Conclave, the initiative bridges the gap between **cultural preservation and economic opportunity**, embodying the ethos of "**Local Goes Global**." It marks a decisive step toward building a **creative, inclusive, and sustainable economy** under **Viksit Bharat @2047**.

UPSC Relevance:

- **Prelims:** Ministry of Culture, Lalit Kala Akademi, Sahitya Akademi, CCRT, IGNC, Janjatiya Gaurav Varsh, Intangible Cultural Heritage, Birsa Munda.
- **Mains (GS Paper 1 – Indian Culture; GS Paper 3 – Economy and Inclusive Growth):**
 - *Topics:* Cultural Economy, Tribal Empowerment through Art, Role of Culture in Sustainable Development.
 - *Keywords:* Cultural Entrepreneurship, Intangible Heritage, Tribal Literature, Local to Global, Heritage Economy, Inclusive Development.
 - *Linkages:* Culture → Enterprise → Livelihood → Sustainable Growth → Viksit Bharat @2047.

5. Modern Capabilities Driven by Disruptive Tech & Start-up Collaboration: The Path to Self-Reliance in Defence

1. Key Highlights and Context

- **Secretary (Defence Production) Shri Sanjeev Kumar**, at the **Delhi Defence Dialogue 2025** organized by the **Manohar Parrikar Institute for Defence Studies and Analyses (MP-IDS)**, emphasized that **modern defence capabilities** depend on **disruptive technologies** and **collaboration with start-ups and innovators**.
- The central theme of the dialogue — "**Harnessing New-Age Technology for Defence Capability Development**" — underscored the need for **technology-led transformation** in India's defence sector to achieve **Atmanirbhar Bharat (self-reliance)**.



- The Secretary highlighted that **Artificial Intelligence (AI), Machine Learning (ML), Quantum Computing, Robotics, and Unmanned Systems** are the defining features of 21st-century warfare, requiring a flexible and innovation-driven ecosystem.

2. Role of Disruptive Technologies in Defence Modernization

- **Disruptive technologies** are those that fundamentally alter existing paradigms, offering **exponential improvements** in speed, accuracy, and operational capability.
- **AI and ML** enhance autonomous decision-making, threat prediction, and precision targeting.
- **Quantum Computing** improves encryption, cybersecurity, and simulation of battlefield scenarios.
- **Robotics and Unmanned Aerial Systems (UAS)** revolutionize surveillance, logistics, and combat operations.
- Shri Sanjeev Kumar stressed that **integration of digital technologies** with defence manufacturing will strengthen **India's deterrence capabilities** and ensure **technological sovereignty**.



3. Start-up Ecosystem and Innovation Platforms

- India's **defence innovation ecosystem** has been significantly advanced through:
 - **Innovations for Defence Excellence (iDEX)**: A flagship initiative under the **Department of Defence Production**, fostering collaboration between **start-ups, MSMEs, and the armed forces** to co-develop cutting-edge defence technologies.
 - **Technology Development Fund (TDF)**: Provides financial assistance to **industry and academia** for developing indigenous prototypes and critical defence technologies.
 - These initiatives align with **Defence Acquisition Procedure (DAP) 2020**, which emphasizes **indigenous content** and **Buy (Indian-IDDMM)** category procurement.
- The Secretary urged for **seamless information sharing** among stakeholders — government, industry, academia, and innovators — to accelerate the **research-to-deployment cycle**.

4. Strategic and Policy Framework

- The push for defence self-reliance is guided by key policy frameworks such as:
 - **Defence Production and Export Promotion Policy (DPEPP) 2020** – aims to achieve a turnover of ₹1.75 lakh crore in defence manufacturing and exports by 2025.
 - **Atmanirbhar Bharat Abhiyan** – focuses on developing **indigenous capabilities** and reducing import dependency in defence systems.
 - **Strategic Partnership Model** – enables collaboration between the public and private sectors for manufacturing advanced platforms like submarines, fighter jets, and helicopters.
- The **Defence Research and Development Organisation (DRDO)**, in coordination with private players and start-ups, serves as the backbone for **R&D integration** and **dual-use technology development**.



5. Legal, Constitutional and Security Dimensions

- Defence production and national security fall under **Union List Entry 1 & 2 (Seventh Schedule, Article 246)** — empowering the Union Government to legislate and execute defence policies.
- Initiatives like iDEX are implemented under the **Armed Forces (Special Powers) framework** for innovation and procurement flexibility.
- India's defence industrial base is increasingly aligned with **Article 51(c)** of the Constitution, which promotes international cooperation in technology while maintaining strategic autonomy.
- These developments also resonate with India's **National Security Strategy and Defence Indigenisation Roadmap**, ensuring preparedness against hybrid and cyber warfare threats.

6. Key Definitions for Conceptual Clarity

- **Disruptive Technology:** A breakthrough innovation that radically changes existing systems, displacing older methods (e.g., AI replacing manual analysis in surveillance).
- **Atmanirbhar Bharat in Defence:** The policy framework promoting indigenous research, design, and production of defence systems to minimize foreign dependence.
- **Start-up Collaboration:** Partnership between emerging entrepreneurs and defence establishments to co-develop mission-critical technologies.
- **Quantum Computing:** Advanced computation using quantum bits (qubits) for solving complex defence algorithms and encryption tasks exponentially faster than classical computers.

Conclusion

The focus on **disruptive technologies** and **start-up collaboration** reflects a strategic shift in India's defence production model—from dependency to **innovation-driven self-reliance**. Initiatives like **iDEX** and **TDF** symbolize the convergence of **industry, innovation, and infrastructure**, embodying the “*Whole-of-Nation Approach*” to defence capability building. As modern warfare becomes increasingly technology-intensive, India's investment in **AI, quantum, and autonomous systems** will be pivotal for achieving **strategic autonomy**, enhancing **combat readiness**, and realizing the **vision of Atmanirbhar Bharat in Defence**.

UPSC Relevance:

- **Prelims:** iDEX initiative, Technology Development Fund, DPEPP 2020, DRDO, Defence Acquisition Procedure 2020, Atmanirbhar Bharat Abhiyan.
- **Mains (GS Paper 3 – Security and Economy):**
 - *Topics:* Defence Indigenisation, Technology in Warfare, Public-Private Partnership in Defence Sector.
 - *Keywords:* Disruptive Technology, Quantum Defence, AI in Warfare, Start-up Ecosystem, Self-Reliance, Defence Production Policy.
 - *Linkages:* Science & Technology → Defence Innovation → Strategic Autonomy → National Security.



6. Department of Financial Services (DFS) Launches Start-up Common Application Journey on Jan Samarth Portal

1. Key Launch and Objective

- The **Department of Financial Services (DFS), Ministry of Finance**, launched the **Start-up Common Application Journey** on the **Jan Samarth Portal**, providing a **single digital gateway** for start-ups to access credit from all **Public Sector Banks (PSBs)**.
- Developed by the **Indian Banks' Association (IBA)** in collaboration with **PSB Alliance**, the initiative aims to **simplify, digitize, and standardize** the credit application process for start-ups.
- The move aligns with the government's broader vision of **Viksit Bharat @2047**, emphasizing **ease of doing business, financial inclusion, and start-up empowerment** through a technology-driven ecosystem.

2. Features and Functional Mechanism

- The platform enables **start-ups to apply for loans, compare bank offers, and track application progress** through a unified digital interface, ensuring **speed, efficiency, and transparency**.
- Backed by a **Model Loan Scheme**, start-ups can avail **loans up to ₹20 crore** under the **Credit Guarantee Scheme for Start-ups (CGSS)** managed by the **National Credit Guarantee Trustee Company (NCGTC)**, under the aegis of the **Department for Promotion of Industry and Internal Trade (DPIIT)**.
- The system integrates data from **PAN, GST, Udyam Registration, ITRs, and Credit Bureaus**, ensuring automated verification and faster loan approvals.
- **Special interest concessions for women entrepreneurs** promote **gender-inclusive entrepreneurship**.



3. Institutional Collaboration and Governance

- The initiative was launched during the **Public Sector Banks Review Meeting** in the presence of the **Secretary, DFS, Chairman of IBA, MDs and CEOs of PSBs, and PSB Alliance officials**.
- **Jan Samarth Portal**, an integrated platform launched under the **National Credit Framework**, already hosts multiple government-linked credit schemes such as **PMEGP, PM Svanidhi, Mudra, and Stand-Up India**; the new start-up module adds a key layer to **India's start-up credit architecture**.
- The initiative represents **coordinated institutional synergy** among financial regulators, PSBs, and industry bodies to strengthen credit access for **innovation-led enterprises**.

4. Legal, Policy and Constitutional Framework

- The initiative aligns with:
 - **Startup India Action Plan (2016)** – promoting access to funding and regulatory support for start-ups.
 - **Credit Guarantee Scheme for Start-ups (CGSS)** – provides collateral-free credit backed by **NCGTC**.



- **Digital India Mission** – ensuring **paperless and transparent** digital service delivery.
- **Atmanirbhar Bharat Abhiyan** – promoting self-reliance through entrepreneurial growth.
- Constitutionally, it supports **Article 19(1)(g)** (freedom to practice any profession or carry on any trade) and **Directive Principles (Article 38 & 39)** advocating equitable economic growth and entrepreneurship promotion.
- The initiative also aligns with **RBI's Financial Inclusion and Priority Sector Lending guidelines**, ensuring credit flow to the start-up sector.

5. Significance and Expected Impact

- **Simplified Access to Finance:** Reduces barriers for start-ups, especially in Tier-II and Tier-III cities, by providing an integrated credit access point.
- **Boost to Start-up Ecosystem:** Strengthens India's rank in **Ease of Doing Business and Global Innovation Index** by promoting financial empowerment.
- **Inclusive Growth:** Encourages participation of **women and youth entrepreneurs** through concessional interest rates and collateral-free lending.
- **Digital Integration:** Reduces manual processing, ensures **data interoperability**, and curbs duplication or delay in loan approvals.
- **Employment Generation:** Strengthened credit flow to start-ups will boost innovation-led job creation and contribute to **India's \$5 trillion economy target**.

6. Key Definitions for Conceptual Clarity

- **Start-up:** As per DPIIT, an entity less than 10 years old with annual turnover under ₹100 crore, focused on innovation, development, or improvement of products or services.
- **Credit Guarantee Scheme for Start-ups (CGSS):** A government-backed initiative providing credit guarantees to financial institutions lending to eligible start-ups without collateral.
- **Jan Samarth Portal:** A unified digital portal integrating various credit-linked government schemes to facilitate citizen access and enhance transparency.
- **PSB Alliance:** A collective platform of all Public Sector Banks for implementing common digital banking solutions.

Conclusion

The **Start-up Common Application Journey on Jan Samarth Portal** marks a crucial milestone in India's financial digitization and start-up ecosystem. By bridging the gap between **innovation and institutional finance**, it ensures that start-ups — the backbone of India's future economy — receive **timely, transparent, and technology-enabled financial support**. The initiative reflects the government's commitment to **inclusive, tech-driven economic empowerment**, positioning India as a **global start-up hub** under the vision of **Viksit Bharat @2047**.

UPSC Relevance:

- **Prelims:** Jan Samarth Portal, PSB Alliance, Credit Guarantee Scheme for Start-ups (CGSS), NCGTC, DPIIT, Startup India.
- **Mains (GS Paper 3 – Economy, Inclusive Growth, and Government Schemes):**
 - *Topics:* Start-up Financing, Digital Governance, Financial Inclusion, Innovation Ecosystem.



- *Keywords:* Jan Samarth Portal, CGSS, Financial Digitization, Start-up Credit, Atmanirbhar Bharat, Viksit Bharat 2047.
- *Linkages:* Entrepreneurship → Access to Finance → Innovation Economy → Inclusive Growth.

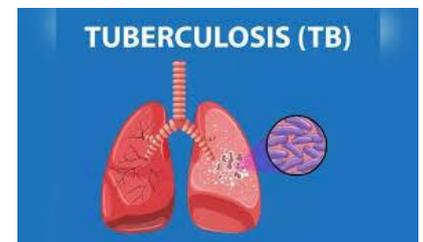
7. India Achieves Historic Progress in TB Elimination: 21% Decline in Incidence, High Treatment Success under TB Mukht Bharat Abhiyan

1. Key Achievement and Global Context

- As per the **WHO Global TB Report 2025**, India's TB incidence has declined by **21%** — from **237 per lakh in 2015** to **187 per lakh in 2024**, almost double the global decline rate (**12%**), making it one of the fastest reductions among high-burden countries.
- **TB mortality** has fallen from **28 per lakh in 2015** to **21 per lakh in 2024**, marking significant progress in reducing TB-related deaths, particularly among HIV-negative individuals.
- This achievement reflects India's **whole-of-government and whole-of-society approach**, aligning with the **National Strategic Plan for TB Elimination (2017–2025)** and the global **End TB Strategy** targets.

2. TB Mukht Bharat Abhiyan: Framework and Technological Innovations

- The **TB Mukht Bharat Abhiyan**, launched in **December 2024**, embodies India's mission to **eliminate TB by 2025**, ahead of the global 2030 target.
- The campaign screened **over 19 crore vulnerable individuals**, diagnosing **24.5 lakh TB patients**, including **8.61 lakh asymptomatic (subclinical)** cases.
- Key innovations include:
 - **AI-enabled handheld X-ray devices** and expanded **NAAT molecular testing infrastructure** for early detection.
 - A **lab network of 9,391 molecular testing facilities** and **107 culture & drug susceptibility labs**, the largest in the world.
 - **Decentralized TB services** through **1.78 lakh Ayushman Arogya Mandirs**, taking care closer to communities.
- **Rifampicin susceptibility testing coverage** stands at **92%**, compared to the global average of **83%**, strengthening drug-resistant TB management.



3. Treatment and Social Support Outcomes

- **Treatment coverage** rose from **53% (2015)** to **92% (2024)** — among the highest globally. Over **26.18 lakh TB patients** were diagnosed and treated in 2024.
- **Treatment success rate** reached **90%**, surpassing the global average of **88%**, reflecting the success of early detection, adherence support, and community engagement.
- Under the **Ni-kshay Poshan Yojana (NPY)**, **₹4,406 crore** has been transferred to **1.37 crore TB patients** via **Direct Benefit Transfer (DBT)** since 2018, with **monthly support enhanced from ₹500 to ₹1000**.



- **6.77 lakh Ni-kshay Mitras** (individuals and organizations) and **over 2 lakh My Bharat youth volunteers** provide psychosocial, nutritional, and logistical support to patients, turning TB elimination into a **Jan Bhagidari (people's movement)**.

4. Financial Commitment and Health System Strengthening

- The **annual budget for the TB programme** has increased **tenfold over nine years**, enabling adoption of **novel diagnostics, shorter regimens, preventive interventions, and digital surveillance systems**.
- **Differentiated TB care models** have been implemented — identifying high-risk patients based on co-morbidities and ensuring personalized treatment plans.
- **ASHA workers** are now trained to identify early warning signs and refer patients to higher medical facilities promptly.
- The integrated approach merges **healthcare access, nutrition, and community empowerment**, reducing “missing TB cases” from **15 lakh (2015) to less than 1 lakh (2024)**.

5. Constitutional, Legal, and Policy Framework

- **Article 21 (Right to Life)** ensures the right to health, while **Directive Principles (Articles 38, 39, 47)** mandate improving public health and nutrition.
- The TB elimination drive is governed under:
 - **National Tuberculosis Elimination Programme (NTEP)** under **Ministry of Health & Family Welfare**.
 - **Ni-kshay Ecosystem**, integrating data, treatment tracking, and community participation.
 - **Public Health (Prevention, Control and Management) Acts** at the state level supporting TB control initiatives.
- Aligned with **SDG 3.3**, which calls for ending the TB epidemic by 2030, India aims to **achieve elimination by 2025**, five years ahead of global goals.

6. Key Definitions for Conceptual Clarity

- **TB Incidence:** The number of new and relapse TB cases occurring per lakh population per year.
- **Drug-Resistant TB (DR-TB):** TB infection caused by bacteria resistant to first-line drugs, especially **Rifampicin** or **Isoniazid**.
- **Ni-kshay Poshan Yojana:** A direct benefit transfer scheme providing monthly nutritional support to TB patients during treatment.
- **Ni-kshay Mitra:** A volunteer or organization supporting TB patients with food, financial, or psychosocial assistance.
- **NAAT (Nucleic Acid Amplification Test):** A molecular diagnostic method for rapid and accurate detection of TB and drug resistance.

Conclusion

India's remarkable **21% decline in TB incidence** and **90% treatment success rate** demonstrate the success of a **multi-dimensional, technology-driven, and community-centric approach** under the **TB Mukht Bharat Abhiyan**. With strong political commitment, digital innovations, and societal participation, India is on track to become **TB-free by 2025**, setting a model for other high-burden countries. The convergence of



healthcare, social protection, and technology underlines India's shift from disease control to **disease elimination and health equity**.

UPSC Relevance:

- **Prelims:** TB Mukht Bharat Abhiyan, Ni-kshay Poshan Yojana, NTEP, Rifampicin Resistance, NAAT, WHO Global TB Report 2025.
- **Mains (GS Paper 2 – Social Justice; GS Paper 3 – Science & Technology, Health):**
 - *Topics:* Public Health Policy, Disease Elimination Programmes, Role of Technology in Healthcare.
 - *Keywords:* TB Elimination, Ni-kshay Mitra, Jan Bhagidari, Preventive Healthcare, Digital Diagnostics, SDG 3.3, Atmanirbhar Swasth Bharat.
 - *Linkages:* Health Governance → Technology Integration → Social Protection → Inclusive Public Health Transformation.

8. India on Track to Command 10% of Global Green Hydrogen Demand by 2030

1. Key Highlights and Strategic Vision

- **Union Minister of State for New and Renewable Energy & Power, Shri Shripad Y. Naik,** announced that **India is poised to meet 10% of global green hydrogen demand by 2030**, reflecting rapid progress under the **National Green Hydrogen Mission (NGHM)**.
- India's **energy transition** is guided by the **Panchamrit commitments** announced at **COP-26**, targeting **500 GW of non-fossil energy capacity by 2030** and **net-zero emissions by 2070**.
- With a **non-fossil capacity of nearly 260 GW**, led by solar and wind, India is now converting renewable energy into **green molecules** such as **hydrogen, ammonia, and methanol**, enabling industrial decarbonization and export competitiveness.

2. National Green Hydrogen Mission: Progress and Achievements

- Launched in **January 2023**, the **National Green Hydrogen Mission** has transitioned from **planning to implementation** with **₹17,000 crore in incentives** for production and electrolyser manufacturing.
- Projects have been sanctioned for **8.62 lakh MTPA of green hydrogen** and **3,000 MW per annum of domestic electrolyser capacity**.
- The **Solar Energy Corporation of India (SECI)** has discovered **globally competitive prices** for the supply of **7.24 lakh MTPA of green ammonia** to fertilizer units—among the **lowest in the world**—enhancing project viability.
- Additional supply contracts for **20,000 MTPA of green hydrogen** have been approved for **IOCL, BPCL, and HPCL refineries**, integrating hydrogen into India's industrial and transport systems.



3. Whole-of-Government and Whole-of-Nation Approach

- **Dr Jitendra Singh**, Union Minister of Science and Technology, highlighted that India's green hydrogen journey reflects a **“whole-of-government, whole-of-nation” approach**, uniting ministries, research institutions, and industries.



- Multiple programmes from the **Department of Science and Technology (DST)** and **Ministry of New & Renewable Energy (MNRE)** have been integrated under NGHM to promote **R&D, innovation, and commercialization**.
- The model fosters **public–private partnerships**, aligns with the **Atmanirbhar Bharat** vision, and ensures long-term sustainability in India’s **clean-energy transition**.
- This collaborative framework enhances **inter-ministerial synergy**, integrates science with industry, and strengthens India’s position as a **leader in green energy technology**.

4. Economic, Environmental, and Technological Implications

- India’s **green hydrogen market** is projected to grow at **20–40% CAGR** over the next decade, supported by policy incentives, renewable resource abundance, and **strategic geography for global trade**.
- Development of **hydrogen hubs and industrial clusters** across states will generate new jobs, foster **regional economic development**, and reduce carbon intensity in sectors such as steel, cement, fertilizers, and mobility.
- Green hydrogen will serve as a **clean feedstock** for industries and a **low-carbon fuel** for heavy transport, contributing to both **energy security** and **climate resilience**.
- The mission strengthens India’s ambition to become a **net exporter of green hydrogen**, reinforcing its position in the **global hydrogen value chain**.

5. Legal, Constitutional and Policy Framework

- Aligned with **Article 48A** (environmental protection) and **Article 51A(g)** (fundamental duty to protect environment), the mission embodies India’s constitutional commitment to **sustainable development**.
- Anchored under the **Electricity Act (2003)** and **Energy Conservation Act (2001)**, and supported by the **National Hydrogen Policy (2022)** and **National Action Plan on Climate Change (NAPCC)**.
- Internationally aligned with **Paris Agreement (2015)** and **SDG 7 (Affordable and Clean Energy) & SDG 13 (Climate Action)**.
- The **National Green Hydrogen Mission (NGHM)** also supports India’s **Nationally Determined Contributions (NDCs)** under the UNFCCC framework.

6. Key Definitions for Conceptual Clarity

- **Green Hydrogen:** Hydrogen produced through electrolysis of water using renewable energy (solar/wind), with zero greenhouse gas emissions.
- **Electrolyser:** A device that splits water (H_2O) into hydrogen (H_2) and oxygen (O_2) using electricity; key to green hydrogen production.
- **Green Ammonia:** Ammonia produced using green hydrogen; used in fertilizers, shipping fuel, and chemical industries.
- **Hydrogen Valley/Hydrogen Hub:** Integrated ecosystems where hydrogen production, storage, distribution, and consumption occur within a regional framework.
- **Whole-of-Government Approach:** A governance model promoting cross-ministerial coordination to achieve national goals efficiently.



Conclusion

India's pursuit of **10% global green hydrogen market share by 2030** marks a defining shift in its energy landscape. Through **National Green Hydrogen Mission, policy coherence, and technological innovation**, India is transforming from a renewable energy leader to a **global hydrogen powerhouse**. The initiative represents not only a climate strategy but also an **economic and geopolitical opportunity**, positioning India as a hub for **clean technology, sustainable growth, and energy diplomacy** under the vision of **Viksit Bharat @2047**.

UPSC Relevance:

- **Prelims:** National Green Hydrogen Mission, SECI, Green Ammonia, Electrolyser Manufacturing, MNRE, Pancharit Commitments (COP-26).
- **Mains (GS Paper 3 – Environment, Economy, Science & Tech):**
 - *Topics:* Energy Transition, Hydrogen Economy, Climate Policy, Atmanirbhar Bharat in Clean Energy.
 - *Keywords:* Green Hydrogen, Whole-of-Government Approach, Hydrogen Mission, Renewable Integration, Decarbonization, Energy Diplomacy.
 - *Linkages:* Renewable Energy → Technological Innovation → Industrial Transformation → Sustainable Development.

9. India–Mauritius Partnership Strengthens through Blue Economy and Governance Cooperation

1. Common Stake in Blue Economy and Sustainable Growth

- **Union Minister Dr. Jitendra Singh** highlighted the shared interest of **India and Mauritius** in the **Blue Economy**, identifying **fisheries, ocean technologies, and desalination** as the next frontiers of sustainable and inclusive growth for both maritime nations.
- The Minister underlined that the **Blue Economy** is not only an environmental necessity but also an **economic opportunity**, encompassing marine resources, coastal development, and renewable ocean energy.
- India's expertise through the **Deep Ocean Mission** and its successful desalination initiatives in **Lakshadweep** demonstrate practical solutions for island nations like Mauritius facing **freshwater scarcity and climate stress**.

2. Capacity Building and Civil Service Cooperation under NCGG Programme

- The event marked the **2nd Capacity Building Programme for Senior Civil Servants from Mauritius**, organized by the **National Centre for Good Governance (NCGG)**, New Delhi, from **10–15 November 2025**.
- The programme is part of a **bilateral cooperation framework signed in March 2025**, under which **500 Mauritian civil servants** will be trained over five years.
- The current delegation of **17 senior officials** from 14 Mauritian ministries, led by **Dr. Dhanandjay Kawol**, represents one of the most senior batches under this collaboration.





- This initiative reinforces India's role as a **capacity-building partner in governance reforms**, supporting Mauritius in performance-based budgeting, digital public administration, and accountability mechanisms.

3. Expanding India–Mauritius Collaboration in Ocean Science and Technology

- Dr. Singh proposed a **ten-year blueprint for ocean economy cooperation**, focusing on **marine research, renewable ocean energy, and digital governance** to enhance island resilience.
- India's **Earth Sciences institutions** could collaborate with Mauritian counterparts in areas like **marine biodiversity, deep-sea exploration, and sustainable fisheries management**.
- Mauritius acknowledged India's assistance in key projects, including a **Forensic Science Laboratory, floating solar energy units, and digitalization of education and social security**, marking India's growing influence in the Indian Ocean Region (IOR).
- This aligns with India's **SAGAR Doctrine (Security and Growth for All in the Region)**, promoting regional stability and blue economy development.

4. Governance and Digital Transformation as Strategic Pillars

- Dr. Jitendra Singh emphasized that **technology acts as an enabler of transparency and transformation**, a principle driving India's **Digital Governance revolution**.
- India's journey towards e-governance—rooted in initiatives like **Digital India, PM Gati Shakti, and Public Service Delivery Portals**—offers replicable models for Mauritius and other developing nations.
- The NCGG programme thus extends India's **Soft Power Diplomacy**, sharing governance best practices to build **accountable, citizen-centric institutions** across the Global South.
- Both nations view digital and administrative collaboration as essential to achieving **efficient, transparent, and sustainable governance systems**.

5. Legal, Constitutional, and Policy Framework

- The cooperation reflects the constitutional spirit of **Article 51 (Promotion of International Peace and Cooperation)** and **Article 253**, enabling India to enter into international agreements for mutual development.
- The **Deep Ocean Mission (2021–2030)**, implemented under the **Ministry of Earth Sciences**, serves as India's flagship initiative for **marine resource utilization and blue economy development**.
- The partnership complements India's commitments under **Sustainable Development Goal 14 (Life Below Water)**, focusing on the conservation and sustainable use of ocean resources.
- The NCGG initiative is part of India's **Development Partnership Administration (DPA)** under the **Ministry of External Affairs**, promoting capacity building in friendly nations, particularly in Africa and the Indian Ocean region.

6. Key Definitions for Conceptual Clarity

- **Blue Economy:** Sustainable use of ocean resources for economic growth, improved livelihoods, and ocean ecosystem health.
- **Desalination:** Process of removing salt and minerals from seawater to produce potable water, crucial for island and coastal regions.



- **Deep Ocean Mission:** India's long-term scientific initiative to explore deep-sea resources, biodiversity, and sub-sea technologies.
- **Digital Governance:** Use of digital technologies to improve efficiency, transparency, and citizen engagement in public administration.
- **SAGAR Doctrine:** India's policy framework for regional maritime cooperation and security in the Indian Ocean.

Conclusion

India's engagement with Mauritius represents a **strategic convergence of ocean-based economic cooperation and governance capacity building**. The partnership underlines India's commitment to the **Blue Economy, climate resilience, and good governance diplomacy**. Through initiatives like the **Deep Ocean Mission, Digital India, and NCGG training**, India is strengthening its role as a global partner in sustainable development and administrative excellence. This collaboration not only enhances India's influence in the **Indian Ocean Region** but also supports the vision of a **secure, prosperous, and sustainable Indo-Pacific** under the **Viksit Bharat @2047** framework.

UPSC Relevance:

- **Prelims:** Blue Economy, Deep Ocean Mission, NCGG, SAGAR Doctrine, Development Partnership Administration (DPA), Digital India Mission.
- **Mains (GS Paper 2 – International Relations & Governance):**
 - *Topics:* India's Soft Power Diplomacy, Capacity Building Partnerships, Maritime Cooperation, Digital Governance.
 - *Keywords:* Blue Economy, India–Mauritius Relations, Desalination Technology, Good Governance Diplomacy, Indo-Pacific Strategy.
 - *Linkages:* Maritime Diplomacy → Blue Economy → Capacity Building → Sustainable Development Goals (SDG 14 & 16).

10. CSIR–NICDC Partnership to Accelerate Innovation and Industrial Transformation in India

1. Key Partnership and Objective

- The **Council of Scientific & Industrial Research (CSIR)** and the **National Industrial Corridor Development Corporation (NICDC)** have signed a **Memorandum of Understanding (MoU)** to create a collaborative framework linking **scientific research with industrial growth** across India's upcoming **industrial corridors**.
- The partnership aims to integrate **CSIR's R&D capabilities** with NICDC's infrastructure development expertise to establish **self-reliant, innovation-driven industrial ecosystems**.
- This collaboration supports flagship national missions including **Make in India, Startup India, and Aatmanirbhar Bharat**, and aligns with the vision of **Viksit Bharat @2047**.

2. Focus Areas and Strategic Goals

- The MoU prioritizes the **creation of R&D hubs, technology incubators, and innovation centres** within industrial cities and smart clusters to foster collaboration between **industry, academia, and research institutions**.



- Key thematic areas of cooperation include **industrial automation, biotechnology, renewable energy, advanced materials, robotics, digital manufacturing, aerospace, medical devices, agro-processing, and green infrastructure.**
- The objective is to enhance **productivity, competitiveness, and environmental sustainability**, transforming India's industrial corridors into **innovation-centric and globally competitive zones.**
- This partnership also supports India's ambition to become a **global technology and manufacturing leader** by enabling **high-tech enterprise growth.**

3. Institutional and Policy Integration

- The **CSIR**, under the **Ministry of Science and Technology**, serves as India's premier R&D network with 37 laboratories across diverse fields of science and engineering.
- The **NICDC**, under the **Department for Promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce and Industry, is responsible for developing **industrial corridors such as DMIC, CBIC, BMEC, and AMTZ**, which form the backbone of India's industrial infrastructure.
- Through this MoU, **scientific research and technological innovation** will be directly embedded into **industrial planning and design**, ensuring that new corridors adopt **cutting-edge technologies and sustainability standards.**
- This aligns with the **National Industrial Corridor Programme (NICP)** and the **National Manufacturing Policy (2011)** which aim to increase manufacturing's contribution to GDP and boost employment.

4. Economic, Technological, and Sustainability Implications

- The collaboration strengthens the **R&D–industry interface**, enabling faster **commercialization of indigenous technologies and technology transfer.**
- It promotes **eco-friendly and energy-efficient industrial systems**, supporting India's **Net Zero 2070 commitments** under the **Paris Agreement.**
- Advanced sectors such as **renewable energy, circular economy practices, and scientific instrumentation** will enhance India's position in **high-value global supply chains.**
- The initiative will catalyse **regional development** by creating technology-based industries, skilled employment, and sustainable infrastructure in **industrial nodes and clusters.**

5. Legal, Constitutional, and Policy Framework

- The partnership aligns with **Article 51A(h)** of the Constitution, which encourages citizens and institutions to develop scientific temper, humanism, and the spirit of inquiry.
- It also resonates with **Article 39(b)** under the Directive Principles, which promotes equitable distribution of resources for the common good.
- The initiative operates within the frameworks of the **Science, Technology and Innovation Policy (STIP) 2020, National Infrastructure Pipeline (NIP), and National Logistics Policy (2022).**
- The MoU also supports India's **Sustainable Development Goals (SDG 9 – Industry, Innovation, and Infrastructure)** and **SDG 13 – Climate Action.**



6. Key Definitions for Conceptual Clarity

- **Industrial Corridor:** A network of industrial zones and smart cities integrated with transport, logistics, and energy infrastructure to promote manufacturing-led growth.
- **R&D (Research and Development):** Systematic activities undertaken to innovate and introduce new knowledge, products, or processes for industrial advancement.
- **Innovation Ecosystem:** A collaborative network of institutions, industries, and academia that fosters technological progress and entrepreneurship.
- **Aatmanirbhar Bharat:** India's self-reliance initiative aimed at promoting domestic manufacturing, innovation, and global competitiveness.
- **Technology Transfer:** The process of moving scientific discoveries from research institutions to industry for commercialization and production.

Conclusion

The CSIR–NICDC MoU represents a landmark step in **bridging India's scientific research with industrial expansion**, fostering a **technology-driven, sustainable, and globally competitive manufacturing ecosystem**. By integrating R&D into industrial corridors, India aims to establish **innovation-led industrial growth models** that drive productivity, sustainability, and inclusive development. This collaboration strengthens India's journey towards becoming a **knowledge-based and self-reliant economy** under the **Viksit Bharat @2047 vision**.

UPSC Relevance:

- **Prelims:** CSIR, NICDC, National Industrial Corridor Programme, Make in India, Aatmanirbhar Bharat, National Manufacturing Policy, Science & Technology Policy 2020.
- **Mains (GS Paper 3 – Economy, Science & Technology, Infrastructure):**
 - *Topics:* Industrial Corridors, Innovation Ecosystem, R&D Collaboration, Sustainable Manufacturing.
 - *Keywords:* CSIR–NICDC Partnership, R&D Integration, Industrial Automation, Aatmanirbhar Bharat, Innovation-led Growth.
 - *Linkages:* Science & Technology → Industrial Policy → Infrastructure Development → Sustainable Economic Growth.