



DAILY EDITORIAL ANALYSIS

TOPIC

**INDIA'S INNOVATION MALAISE:
NEED FOR GLOBALLY COMPETITIVE
MANUFACTURING**

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Context

- India's position at **38th in Global Innovation Index (GII), 2026** has renewed debate over inadequate R&D expenditure, weak private-sector participation and the need for manufacturing-led innovation.

About the Global Innovation Index (GII)

- It is published annually by the World Intellectual Property Organization (WIPO) and evaluates the innovation capabilities and performance of economies.
- It aims to assess how effectively countries develop and translate innovation capabilities into economic and technological outcomes.
- It highlights that innovation depends on a broader business environment, infrastructure and industrial capabilities along with research institutions.

India's Performance in GI 2026

- India has emerged as an important innovation economy, particularly among **lower-middle-income countries**.
- However, structural weaknesses remain:
 - ♦ **R&D Expenditure:** India's Gross Expenditure on R&D (GERD) is approximately **0.6–0.7% of GDP**, considerably below South Korea (around 5%), China (around 2.7%) and other advanced economies.
 - ♦ **Private-sector Participation:** Businesses contribute approximately 41% of India's total R&D expenditure, compared with 70–80% in several innovation-intensive economies.
 - ♦ **Innovation Ecosystem:** India performs relatively well in areas such as ICT services exports, start-ups and knowledge-intensive services but needs stronger manufacturing and technological capabilities.
 - ♦ **Innovation Clusters:** India has **4 clusters (i.e. Bengaluru, Delhi, Mumbai and Chennai)** in the world's top innovation clusters of GI, demonstrating India's growing research potential.
- Translating scientific knowledge into commercially successful products remains a major challenge despite these achievements.

Understanding the Link Between Manufacturing and Innovation

- Innovation and manufacturing have a mutually reinforcing relationship. Globally competitive manufacturing often provides the economic foundation for sustained private-sector R&D investment.
- Important Lessons From East Asian Experiences:**
 - ♦ **South Korea:** R&D expenditure was approximately 0.26% of GDP in 1965 and 0.77% in 1980. During this period, exports increased from 2.6% of GDP in 1960 to 27.7% in 1980. R&D intensity crossed 2% only around 1995.
 - ♦ **China:** It became the world's largest manufacturing economy in 2008, when its R&D intensity was approximately 1.42% of GDP.
 - ♦ **Japan and Taiwan:** Both strengthened their manufacturing and export capabilities before establishing themselves as major technological and innovation centres.
- These experiences suggest that export competitiveness, manufacturing scale and industrial capabilities can generate the resources and incentives necessary for higher R&D investment.

Why Does India's Private R&D Investment Remain Low?

- Several structural constraints discourage Indian businesses from investing in research:
 - ♦ **High Input Costs:** Import duties on critical raw materials, expensive electricity and costly logistics increase manufacturing costs.

- ♦ **Regulatory Burden:** Complex compliance requirements, approval delays and regulatory uncertainty increase the cost of establishing and operating factories.
 - ♦ **Costly Capital:** Relatively expensive borrowing makes long-term, uncertain R&D investments less attractive.
 - ♦ **Limited Global Market Access:** High production costs prevent domestic manufacturers from competing effectively with international producers.
 - ♦ **Protection-driven Competitiveness:** Tariffs and domestic regulatory protections sometimes allow firms to survive without investing sufficiently in productivity, quality and technological advancement.
 - ♦ **Risk Aversion:** Limited tolerance for commercial failure further discourages experimentation and long-term innovation.
- Consequently, inadequate private R&D investment is partly a symptom of deeper weaknesses in India's business and manufacturing environment.

Key Government Initiatives Supporting Innovation

- India has undertaken several initiatives to strengthen its innovation ecosystem:
 - ♦ **Anusandhan National Research Foundation (ANRF):** Promotes research collaboration between universities, research institutions and industries.
 - ♦ **Research, Development and Innovation (RDI) Scheme:** Provides substantial financial support to encourage private-sector investment in strategic and emerging technologies.
 - ♦ **Production Linked Incentive (PLI) Scheme:** Encourages domestic manufacturing, investment, scale and technological upgrading across selected sectors.
 - ♦ **Startup India:** Promotes entrepreneurship, innovation and a supportive start-up ecosystem.
 - ♦ **Atal Innovation Mission:** Encourages innovation and entrepreneurial capabilities through incubation centres and Atal Tinkering Labs.
 - ♦ **India Semiconductor Mission:** Supports the development of domestic semiconductor manufacturing and design capabilities.
 - ♦ **National Quantum Mission:** Promotes research and development in quantum technologies.
- These initiatives can strengthen India's innovation ecosystem, provided they are complemented by improvements in the broader business environment.

Emerging Challenges

- Despite policy interventions, important challenges persist:
 - ♦ Weak industry-academia collaboration and limited commercialisation of research.
 - ♦ Dependence on imported advanced machinery, components and critical technologies.
 - ♦ Fragmented supply chains and inadequate industrial infrastructure.
 - ♦ Regulatory uncertainty and difficulties in enforcing contracts.
 - ♦ Limited integration of MSMEs into global value chains.
 - ♦ Growing technological competition and rapid AI-driven changes in innovation cycles.
- Artificial intelligence is shortening product-development cycles, making speed, adaptability and efficient execution increasingly important determinants of competitiveness.

Way Forward: Building Globally Competitive Manufacturing Ecosystems

- India needs to move beyond treating R&D expenditure as an isolated indicator of innovation and focus on creating an enabling environment for globally competitive manufacturing.
- **Key priorities include:**
 - ♦ **Regulatory Simplification:** Reduce unnecessary approvals, compliance requirements and policy uncertainty through predictable, transparent regulations.

- ♦ **Competitive Input Costs:** Rationalise tariffs on essential industrial inputs, improve electricity quality and affordability, and reduce logistics costs.
- ♦ **Develop Industrial Clusters:** Establish large, integrated manufacturing ecosystems with reliable infrastructure, efficient logistics, simplified clearances and access to skilled labour.
- ♦ **Strengthen Private R&D:** Promote industry-led research through targeted incentives, public-private partnerships, technology transfer and stronger university-industry collaboration.
- ♦ **Improve Ease of Doing Business:** Address delays in taxation, contract enforcement, land access and dispute resolution.
- ♦ **Promote Export-oriented Manufacturing:** Integrate Indian firms into global value chains and encourage competition based on productivity, quality and technological advancement.
- ♦ **Encourage Risk-taking:** Develop stronger venture capital networks, support deep-tech start-ups and create an institutional environment that does not excessively penalise genuine business failures.

Conclusion

- India's innovation ambitions cannot be achieved through increased government funding for R&D alone. It needs first to create an environment where businesses can manufacture efficiently, compete globally and generate sufficient returns to reinvest in research.
- The transition from a protected manufacturing economy to a globally competitive production powerhouse is essential for transforming India from an innovation participant into an innovation leader.

Source: HT

Daily Mains Practice Question

- [Q] Globally competitive manufacturing is a prerequisite for sustainable innovation and increased private-sector investment in Research and Development (R&D) in India. Examine.

