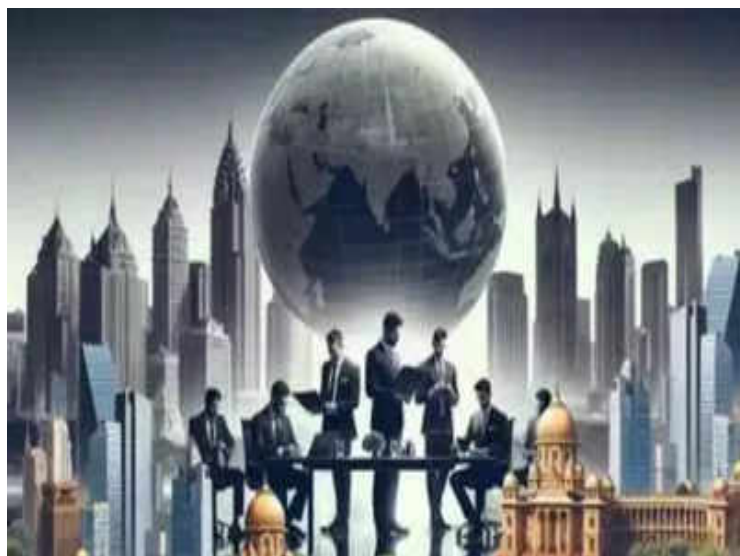


How we can spur Indian R&D and innovation

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As a nation, we have committed ourselves to a long-term goal of becoming a developed country by 2047. Almost all the nations that made the transition from a developing to a developed country in the past century have had indigenous R&D and innovation power this journey at an appropriate stage.

India has made substantial progress in the Global Innovation Index (GII) published by the World Intellectual Property Organisation, moving from a global rank of #76 to #39 in a decade. However, our rank has plateaued in the last three years. Based on our performance under different input parameters for innovation in the GII rankings, we need to strengthen foundational aspects, including improving primary and secondary

school outcomes, increasing the number of professionals in R&D, and increasing the number of professionals employed in knowledge-intensive industries.

Categorise HEIs, provide incentives

Human capital development through the education system is at the core of building this foundation. The National Education Policy 2020 and the expansion of the Atal Innovation Mission will help to boost school outcomes, especially in STEM domains. The Anusandhan National Research Fund (ANRF) has started its mission to strengthen R&D in our public universities. The recently announced ANRF's Partnerships for Accelerated

Innovation and Research (PAIR) programme where the top-ranked universities in India act as R&D hubs mentoring public universities should catalyse the growth of Indian R&D. However, it may not be realistic to expect all institutions of higher learning to be research or innovation focused.

An emphasis on learning outcomes is an equally important objective. This may be a good time to categorise higher educational institutions (HEIs) based on their focus and ensure appropriate incentives are provided to improve their standing in their chosen focus area. 25 years ago, the CSIR launched a New Millennium Indian Technology Leadership Initiative (NMITLI) that piloted govt labs partnering with industry and universities for R&D with the objective of achieving leadership in chosen emerging technologies.

The current context where govt departments are stepping in as buyers of novel indigenous technology-based products from both large companies and Indian deeptech startups is an opportunity for an enhanced NMITLI v2 that encompasses later stages of the technology development cycle, and organisations like the centrally funded HEIs and national R&D missions. The govt's mission-mode programmes like the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) and the National Quantum Mission (NQM) are making strides in the right direction to build foundational R&D capabilities and can also pilot NMITLI v2.

Patents surge, license them

The recent trajectory of our leading institutions with respect to translational R&D and innovation bodes well for the future. The number of patents filed by all our institutes of eminence has shown an increase over the past years. IIT Madras had 435 patent grants in FY24 which was more than double what it had in FY23. This is a good time to focus on licensing these patents and nurturing translational startups around them. The recent fund raise by an IIT Bombay translational startup Sedemac, that makes power management components for use in small engines, electric vehicles, and e-bikes at a reported valuation of \$250

million shows the potential of such an approach. BITS Pilani's PhD-DRIVE launched about a year ago is a unique programme with an explicit focus on deeptech research, innovation, value generation, and entrepreneurship that could be a model for others.

Our HEIs have the potential to do even better if some procedural hurdles are removed. The govt's General Financial Rules (GFR) were designed to provide a governance and regulatory framework for spending by govt departments and need to be modified for R&D projects. Some of the major modifications needed include coopting peer reviews as a mechanism to monitor projects, relaxing requirements of bidding and tendering for specialised equipment, allowing competent private companies and deeptech startups to be eligible for govt grants, and making it easier to award cost-plus contracts for R&D projects.

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