भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

India

Science, Technology & Innovation

OUTLOOK 2026

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

India

Science, Technology & Innovation

OUTLOOK 2026

ISBN: 978-81-991742-3-8

Curated by: Mr. Kunal Thakur, Mr. Arnav Bhasin, Mr. Sankalp Mishra, Dr. B. Chagun Basha

Publication Design & Infographics: Mr. Archit Dhiman, Mr. Shakun Shan, Mr. Rohan Das

Citation: K. Thakur, A. Bhasin, S. Mishra, and B. C. Basha, *India Science, Technology and Innovation (STI) Outlook 2026*. New Delhi, India: Office of the Principal Scientific Adviser to the Government of India, Oct. 2026.

Foreword

Scientific progress and technological competitiveness are playing an increasingly important role in strengthening economies and addressing challenges that transcend borders. For India, a strong science, technology and innovation (STI) ecosystem is central to our aspiration of becoming a developed nation - one that builds on scientific excellence to drive inclusive growth, technological advancement and strategic self-reliance.

India has made significant strides in building its scientific institutions, nurturing talent and applying knowledge to national and global developmental priorities. As technologies evolve and new opportunities emerge, it is important that we build on these foundations with a clear understanding of where we stand, what we do well and where greater collaboration and collective effort are needed.

A key contribution of this Outlook is its effort to bring together information on India's STI landscape that is often spread across institutions and sources. By making this information more accessible, it can help policymakers and institutions identify shared priorities, strengthen coordination and discover opportunities for collaboration across sectors. It can also help international partners better understand India's scientific and technological capabilities and identify avenues for meaningful engagement, while enabling Indian stakeholders to connect with one another and build new partnerships.

The 'India Science, Technology and Innovation (STI) Outlook 2026' is an important step towards developing a comprehensive evidence base for a more informed and shared understanding of India's STI ecosystem. I hope it will support better decision-making, encourage purposeful collaboration, and help translate India's scientific and technological strengths into lasting benefits for the people and meaningful contributions to global progress.

Prof Ajay Kumar Sood
Principal Scientific Adviser to the Government of India

Message

The International Technology Engagement Strategy (ITES) of the Office of the Principal Scientific Adviser to the Government of India seeks to strengthen India's science, technology and innovation (STI) partnerships through a systematic understanding of capabilities, priorities and opportunities for collaboration. An important part of this effort is the development of country-level and technology-specific dossiers and factsheets that serve the needs of both domestic and international stakeholders.

The 'India STI Outlook 2026' is a key resource under this initiative: a single-source dossier bringing together the institutional landscape, policy priorities, research capabilities and international engagement of India's STI ecosystem. It combines an overview of the evolution of science and technology in India with quantitative evidence across a range of indicators, including research and development expenditure, human resources, research publications, patents, innovation performance, institutional capacity and international collaboration. Read together, these indicators offer a more rounded view of India's scientific and technological strengths, while helping identify areas that merit further attention.

The Outlook is intended to be more than a descriptive publication. Its practical value lies in making information easier to navigate and use. By bringing together relevant institutional information and points of contact alongside policy and capability mapping, it can help stakeholders identify relevant organisations, locate potential partners and pursue opportunities for engagement. This is particularly valuable for engaging with a diverse ecosystem in which information, capabilities, and expertise are distributed across ministries, research organisations, academic and industrial entities, and other organisations.

As India's STI ecosystem continues to evolve, this Outlook can provide a useful baseline for tracking emerging capabilities, updating the evidence base and identifying new areas of strategic relevance. This 2026 edition represents a first step in bringing together a comprehensive picture of India's STI landscape and is not exhaustive. Its value will grow through periodic updates to keep it current and responsive to evolving priorities, emerging developments and new opportunities. It is my hope that this Outlook will serve as a useful and evolving reference for stakeholders across India's STI ecosystem, supporting informed dialogue, evidence-based policymaking and a shared understanding of the country's scientific and technological trajectory.

Dr. Parvinder Maini
Scientific Secretary
Office of the Principal Scientific Adviser to the Government of India

Executive Summary

India's science, technology and innovation (STI) ecosystem is entering a consequential phase of transformation. The imperative is no longer confined to expanding scientific output or strengthening research capacity; it increasingly lies in converting these foundations into technological capabilities, industrial competitiveness, supply-chain resilience and solutions to societal challenges. As technological convergence reshapes economic systems and partnerships, India's STI trajectory will be determined not only by the knowledge it generates, but also by how effectively it translates that knowledge into innovation, manufacturing capacity and international impact. The India STI Outlook 2026 edition presents a comprehensive overview of this evolving landscape through five interconnected dimensions: the evolution of India's STI system; its institutional architecture; its R&D and innovation performance; its missions and policies; and its growing engagement with international scientific enterprise.

Advancing Towards Technological Frontiers

India's scientific journey reflects an evolution from building foundational scientific capacity to pursuing technological self-reliance, innovation-led growth and strategic engagement with the world. The Scientific Policy Resolution of 1958 (SPR-1958) established an enduring commitment to science as an instrument of national development. Subsequent policy milestones progressively broadened this vision, with the Technology Policy Statement of 1983 (TPS-1983) and the Science and Technology Policy of 2003 (STP-2003) emphasising indigenous technological competitiveness and integration with the global economy, and the Science, Technology and Innovation Policy of 2013 (STIP-2013) explicitly strengthening the relationship between R&D, entrepreneurship, startups, and industry for inclusive growth.

This evolution is visible in India's achievements across diverse domains. Its pharmaceutical industry has established a major global presence in affordable medicines; digital public infrastructure such as the Unified Payments Interface (UPI) demonstrates the potential of technology at population scale; and missions such as Chandrayaan-3 and the Mars Orbiter Mission showcase capabilities in complex space technologies. These achievements illustrate Indian institutions' capacity to deliver ambitious technological outcomes when scientific expertise, sustained investment, and clear national priorities converge.

The next phase, however, requires moving beyond individual successes towards a broader, sustained capacity to develop, manufacture, deploy and scale advanced technologies in various sectors. It is essential to make technological capability more pervasive across the economy, strengthening indigenous innovation while gaining substantial strength in the global value chain.

Expanding an Interconnected STI Ecosystem

India's STI ecosystem encompasses central and state government institutions, scientific departments and laboratories, higher education institutions of varying scale, institutions of national importance, public-sector enterprises, private R&D centres, startups, industry (including MSMEs), incubators, research parks and technology clusters. This vast architecture provides a foundation for growing R&D activities, capacity development initiatives, and technology development and commercialisation efforts.

The private sector is becoming an increasingly important component of this system. According to the data compiled in this Outlook, India has more than 5,300 private-sector R&D institutions among the 8,252 R&D institutions covered by the national directory. The ecosystem also includes multinational R&D centres, global capability centres (GCCs), university-linked research parks, technology translation initiatives and a growing deep-tech and deep-science startup community. Together, these actors create opportunities to accelerate scientific discovery, enable industry-academia partnerships, boost investments including FDI, and facilitate appropriate market adoption. Strengthening these stakeholder linkages across disciplines, institutions, and sectors to translate scientific capabilities into commercially viable technologies and broader public value is a key priority for the Indian STI ecosystem.

What the Metrics Reveal about India's STI Performance

India's STI performance demonstrates considerable expansion in the scale of research activity and innovation. Gross expenditure on research and development (GERD) increased from ₹ 60,197 crore in 2010–11 to 2,44,768 crore in 2023–24. Its share of GDP rose from 0.77% to 0.84% over the same period. The Outlook reports subsequent estimates of 0.87% for 2024–25 and 0.90% for 2025–26; these are estimates rather than finalised expenditure figures. The trend reflects an expanding resource base, although sustaining research-intensive growth will require continued investment and a stronger capacity to mobilise long-term private capital.

A particularly important development is the changing composition of R&D financing. Private-sector investment accounted for 51.85% of national R&D expenditure in 2023–24, compared with 36.4% in 2020–21. Business enterprise R&D expenditure more than doubled between 2020–21 and 2023–24, reaching approximately 1.21 lakh crore. This signals a more prominent role for industry in India's research landscape and creates an opportunity to align scientific capability more closely with industrial innovation and technological development.

India's human-capital base is another major strength. The country has around 1.01 crore STEM enrolments (2023–24), and nearly one in three of its tertiary graduates (30.69%) is from a STEM programme. Its research output is substantial: nearly 300,000 research publications were recorded in 2024, with international co-authorship contributing

approximately one-quarter of the total. Research activity spans established strengths in energy, materials, information and communication technologies, and fundamental science, alongside growing activity in AI, quantum technologies, semiconductors, biotechnology and other mission-critical areas.

Innovation indicators provide further evidence of momentum. Patent applications in India exceeded 100,000 in 2024, while patent grants increased from 6,022 in 2015 to 64,941 in 2024. Resident applications have also risen as a share of total filings, pointing to a strengthening domestic intellectual-property base. India ranked 38th among 139 economies in the Global Innovation Index 2026, with innovation outputs ranked 25th. Bengaluru, Delhi and Mumbai also feature among the world's leading innovation-intensive clusters.

The startup ecosystem adds an important dimension to this picture. By June 2026, India had more than 2.4 lakh DPIIT-recognised startups, placing it among the world's largest startup ecosystems. More than half of Indian startups are reported to emerge from Tier-II and Tier-III cities, indicating that entrepreneurial activity is spreading beyond established metropolitan centres. Increasingly, the opportunity is not confined to software-led and digital business models: it extends to ventures developing technologies grounded in scientific research and engineering. India's deeptech startups count is crossing 10,000 in various frontier and convergent technological areas. This number is growing fast.

These indicators need to be interpreted together to understand the expanding nature of research output, patents, talent and entrepreneurial activity that contribute to technological leadership, productivity gains or high-value manufacturing.

Pursuing a Mission-Oriented Approach

India is increasingly adopting a mission-oriented approach for technological advancements and their adoption. The efforts are to build capabilities in technological areas that matter for national development and strategic resilience. Missions such as the IndiaAI Mission, National Quantum Mission (NQM), National Mission on Interdisciplinary Cyber-Physical Systems and India Semiconductor Mission (ISM 2.0) focus on each aspect of the technological value chain, including R&D, translation, manufacturing and large-scale adoption. This approach also extends across biotechnology and biopharmaceuticals, deep-ocean, green hydrogen, electric mobility, carbon capture, climate and weather science, critical minerals, drones, technical textiles and space. The value of this approach will ultimately depend on how effectively policy ambition translates into lasting technological capabilities. A key priority is to ensure that missions are backed by sustained funding, clear milestones and credible pathways from research and development to demonstration, commercialisation and wider adoption across Technology Readiness Levels (TRLs). A whole-of-government approach is also helping identify synergies across missions and reduce fragmentation, particularly where research capabilities, infrastructure and industrial needs intersect.

Assessing progress therefore requires looking beyond announced investments and programme activities to measurable outcomes: indigenous IPs, technological advances and transfers, successful prototypes, industrial adoption and wider economic and societal benefits. A stronger evidence base can help track these outcomes, identify persistent gaps and inform course corrections. The priority is to ensure that mission-oriented policies deliver not just individual technological advances, but interconnected capabilities that strengthen India's long-term innovation and industrial base.

India as a Strategic Partner in the Global S&T Enterprise

India's expanding STI capabilities are reshaping its position in the global S&T enterprise. Beyond merely participating, India is increasingly positioned to contribute scientific talent, research infrastructure, technological solutions, entrepreneurial capabilities and a substantial market for large-scale innovations. Its research collaborations, growing IP activity, dynamic start-up ecosystem and increasing attractiveness as a destination for R&D investment provide a foundation for deeper and more strategically aligned international partnerships.

The strategic value of international S&T engagement lies in its ability to strengthen domestic capabilities while generating reciprocal benefits. Such partnerships can also mobilise scientific and technological capabilities to address shared global challenges, while advancing the interests of developing economies for equitable international technology governance.

The growing centrality of S&T in India's international engagements is reflected in frameworks such as the India-US TRUST initiative, the India-UK Technology Security Initiative (TSI) and the India-EU Trade and Technology Council (TTC). India's participation in major international scientific endeavours, including CERN, ITER, and the SKA Observatory, demonstrates its engagement with collaborative research at scale. India's proactive engagement in international standard-setting, technology governance, and multilateral policy processes also provides avenues to contribute to the norms, standards and institutional arrangements that shape emerging technologies and their global diffusion.

The next phase of India's international S&T engagement will depend on how effectively external partnerships are connected with domestic research priorities, industrial capabilities and long-term technological ambitions. This calls for a shift from predominantly platonic exchange-based engagements and discrete collaborative projects towards sustained research networks, co-development and ownership of technologies, industrial partnerships, shared infrastructure and deeper integration into global innovation value chains. The objective is not only to access global knowledge and technology, but also to contribute to their creation, influence the frameworks governing their development and application, and ensure that international collaboration translates into enduring scientific, technological and economic value for India and its partners.

Chapter 1

Evolution

10 - 17

Chapter 2

Institutional Ecosystem

Apex Advisory Bodies

Science and Technology Ministries & Departments

Sectoral Ministries Contributing to S&T Ecosystem

Innovation Promotion Agencies

State/UT S&T Agencies

National Academies

Industry Bodies

18 - 75

Chapter 3

Metrics

Investments in R&D

Human Capital in S&T

Higher Education Ecosystem

R&D Performing Organisations

Innovation Enablers

India's Industrial Ecosystem

Knowledge Capacity

Patents

High Technology Export

Global Innovation Index

76 - 149

Chapter 4

Missions & Policies

150 - 233

Chapter 5

Internationalisation

India as a Partner of Scale

India's S&T Partnerships

Ongoing International S&T Collaborations

India's Internationalisation Priorities

234 - 258

India STI Outlook 2026

Chapter I

Evolution

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

This chapter traces the development of institution-building, policy development, and technological advancement in India's Science, Technology, and Innovation (STI) ecosystem from the pre-independence period to the present. It highlights the role of science and technology in nation-building, economic development, and technological self-reliance. It also outlines major policy shifts that have shaped India's scientific progress. These include the emphasis on indigenous capabilities economic liberalisation, innovation, and global competitiveness. It further presents key scientific and technological achievements, as well as India's growing focus on emerging and frontier technologies.

India's science and technology journey has deep roots that extend well before its independence in 1947. It goes back to the period when science was seen not only as a domain of knowledge but also as a tool for strengthening national capabilities and supporting future development. Early developments such as the establishment of the Indian Association for the Cultivation of Science in 1876 by Dr. Mahenderalal Sircar; the Indian Institute of Science, Bengaluru, in 1909 through the joint efforts of industrialist Jamsetji Nussarwanji Tata and the Maharaja (King) of Mysuru; the Bose Institute in 1917 as Asia's first modern interdisciplinary research centre by J.C Bose; and the Council of Scientific and Industrial Research in 1942 by Dr. Shanti Swarup Bhatnagar and Sir Arcot Ramasamy Mudaliar helped to create the foundation of India's scientific ecosystem. These institutions supported both basic and applied research and reflected the early roles of private enterprise, philanthropy, and patriotic passion in building India's scientific capacity. They also helped position Indian research within the global scientific community before India became independent.

Building the foundations of India's S&T ecosystem, 1876–1969

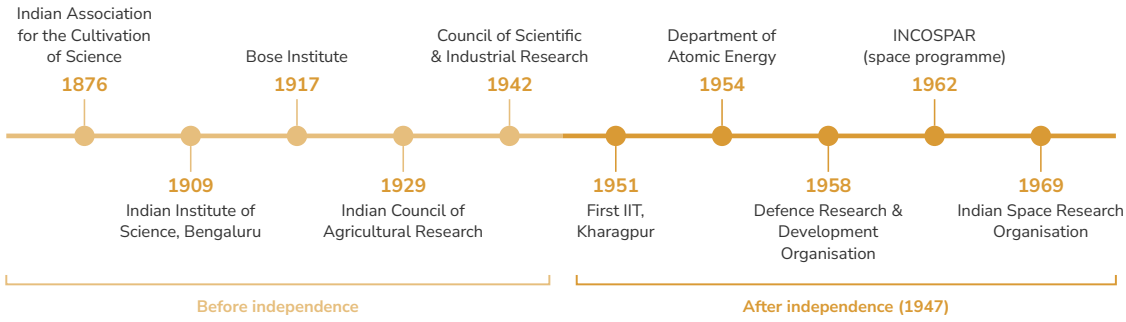


Fig 1: Timeline of milestones in India's S&T foundation

After independence, India faced several social challenges, including poverty, famine, food insecurity, low industrial capacity, weak infrastructure, and limited technical manpower, many of which were shaped by the legacy of colonial rule. Yet, India prioritises treating science and technology, alongside social welfare, as essential instruments of long-term development. India's conception of a socialistic and welfare state extended beyond political, social, and economic development to include scientific advancement, as science provided the tools and methods through which the state could strengthen its capacity to serve its citizens.

From 1947 to 1967, India established major foundational institutions for its science and technology ecosystem. The state expanded CSIR labs, established higher technical institutions such as the IITs, and supported research in atomic energy, agriculture, defence, space, medicine, and industry. These investments were part of a long-term national strategy to use science and technology for development, self-reliance, and state capacity. Institutions such as the Council of Scientific and Industrial Research (1942), the first Indian Institute of Technology at Kharagpur (1951), the Department of Atomic Energy (1954), the

Defence Research and Development Organisation (1958), and later the space programme through INCOSPAR (1962) and ISRO (1969) helped India build capabilities across industrial research, engineering education, atomic energy, defence and space technology. Dr. Shanti Swarup Bhatnagar, Dr. Homi Bhabha, Dr. Vikram Sarabhai, and Dr. C.V. Raman were among the architects of this transformation.

Their contributions formed part of the broader nation-building strategy centred on S&T [1]. The second chapter (Institutional Ecosystem) details the institutional structure that emerged from this vision.

The Scientific Policy Resolution of 1958 became the cornerstone of India's science-based industrialisation. It aimed to "foster, promote and sustain" the cultivation of science and scientific research in all its aspects. It promoted individual initiative in acquiring and discovering knowledge, and it linked science with academic freedom and socio-economic transformation. The policy placed science at the centre of India's development imagination

This foundation helped India achieve major sectoral milestones. In agriculture, the ICAR, established in 1929, became a major institution for agricultural research and education. In later decades, this institutional base helped produce and support scientists such as M.S. Swaminathan, who played a major role in the Green Revolution and in India's movement from food scarcity to agricultural surplus. Similar national use of science can be seen in the White Revolution, the Blue Revolution, the atomic energy program, and the Pokhran nuclear tests. These were reflections of India's long-term strategy to use science and technology to build resilience, sovereignty, and developmental capacity.

By the 1970s and 1980s, another major factor that shaped Indian science and technology policy was technological denial (restricted access to advanced technologies). After India conducted its nuclear test in 1974, several advanced technologies became restricted for India [2], making technological self-reliance central to foreign policy. This created stronger support for indigenous technology development and import substitution [3]. This background shaped the Technology Policy Statement, 1983. The policy stated that political freedom must lead to economic independence and the alleviation of poverty. It saw science and technology as the basis of economic progress and placed technological self-reliance at the centre of national policy. The 1983 policy marked a shift: alongside technological development, indigenous capability, support for technology utilisation, and competitiveness in key areas, it also focused on institution-building.

[1] V. V. Krishna, "India," in *The Role of the State: BRICS National Systems of Innovation*, M. Scerri and H. M. M. Lastres, Eds. Routledge, 2013, ch. 4, pp. 113–154, doi: 10.4324/9780367818524.

[2] Y. Joshi, "From Ambivalence to Resurgence: India's Journey as a Nuclear Power," *India Quarterly: A Journal of International Affairs*, vol. 78, no. 2, pp. 350–370, Jun. 2022. [Online]. Available: https://doi.org/10.1177/09749284221090552. [Accessed: June. 22, 2026].

[3] V. V. Krishna, "Changing Policy in Science and Technology in India," in *Science and Technology Policy*, Oxford, U.K.: UNESCO-EOLSS Publishers, [Online]. Available: https://www.eolss.net/sample-chapters/c15/e1-30-05-02.pdf. [Accessed: Jun. 22, 2026].

The 1983 policy also reflected India's experience with technology denial. The denial of advanced technologies by global powers did not stop India's technological journey; rather, it made technological self-reliance a policy imperative. India's development of strategic capabilities in nuclear energy, space, missiles, defence systems, and later high-performance computing pushed the country towards internal technological development and indigenisation. Self-reliance in India's S&T history was a response to global inequality in access to technology.

This period also connected science with constitutional morality. In 1976, through the 42nd Constitutional Amendment, the "scientific temper" was added to the Constitution as a Fundamental Duty under Article 51A(h). It became the duty of every citizen "to develop the scientific temper, humanism and the spirit of inquiry and reform" [4]. This constitutional duty gave India's S&T journey a broader civic meaning. Science was not only a state project or an expert activity; it became part of the responsibility of citizenship.

The next major phase came after India's economic liberalisation in 1991. Liberalisation changed the environment for technology development by creating greater space for technology imports, private enterprise, and in-house R&D. At the same time, India continued to strengthen its strategic technological capabilities. India's Pokhran-II nuclear test in 1998 and the launch of an indigenous satellite demonstrated that liberalisation did not mean abandoning self-reliance, but rather openness to global technology while maintaining autonomy in strategic sectors.

The Science and Technology Policy, 2003, signalled India's transition towards a more open, competitive, and innovation-oriented science and technology system. By this time, India had built a strong base of scientific manpower. The policy recognised that India was in a position not only to understand technologies borrowed from elsewhere, but also to create its own technologies with extensive scientific inputs of indigenous origin [5]. This phase placed greater emphasis on technology liberalisation, public-private partnerships, intellectual property, global competitiveness, and the integration of science and technology across all spheres of national activity. This phase highlights India's trajectory towards an open innovation system shaped by globalisation, international cooperation, and industry participation [6].

The Science, Technology, and Innovation Policy, 2013, marked another important shift. The policy was developed in the broader context of India's declaration of 2010–2020 as the "Decade of Innovation," which sought to place innovation at the centre of economic growth

[4] Constitution of India, Part IV: Directive Principles of State Policy and Fundamental Duties,Ministry of External Affairs, 2026. [Online]. Available: https://www.mea.gov.in/images/pdf1/Part4.pdf . [Accessed: Jun 30, 2026].

[5] Department of Science and Technology, Government of India, "Science and Technology Policy 2003," IndiaBioscience, Jan. 2003. [Online]. Available: https://indiabioscience.org/media/articles/STP-2003.pdf. [Accessed: Jul. 01, 2026].

[6] P. N. Desai, "Globalization of Innovations: Changing Nature of India's Science and Technology Cooperation Policy," *Institutions and Economies*, vol. 1, no. 1, pp. 53–78, Apr. 2009. [Online]. Available: https://ojie.um.edu.my/index.php/ijie/article/view/4751/2572 [Accessed: Jul. 2, 2026].

and responses to developmental challenges [7]. STIP 2013 advanced the objectives of the Decade of Innovation by bringing science, technology, and innovation together within a common policy framework. Apart from research institutions and public laboratories, it sought to strengthen the integration of India's S&T system with industry and entrepreneurship. [8]. The 2013 policy aimed to position India among the top five global scientific powers and to link the science, research, and innovation system to inclusive growth. It prioritised sectors such as agriculture, energy, and water; encouraged interdisciplinary research; recognised traditional knowledge; proposed funding mechanisms for innovation incubators; supported innovation for social inclusion; and backed STI-driven entrepreneurship.

Milestones in India's S&T policy, 1958–2013

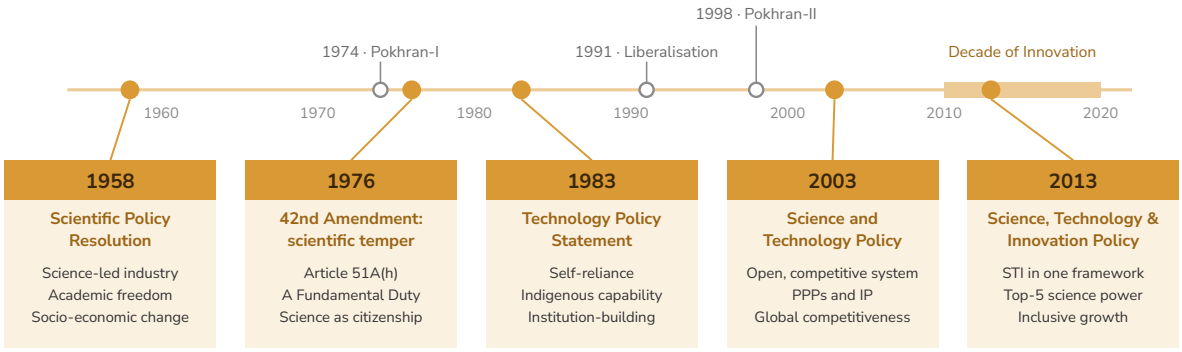


Fig 2: Timeline of milestones in India's S&T policy (1958-2013)

The growth and maturity of India's science and technology ecosystem can be reflected in a range of indicators, including investments in R&D, human capital, higher education, patents, industrial ecosystems, innovation enablers, and high-technology exports. A detailed analysis of these dimensions is presented in Chapter 3 (Metrics).

Moving further, India's S&T ecosystem aspires to lead in emerging and frontier technologies, building on areas where the country has already demonstrated its capability. For example, in biotechnology and pharmaceuticals, India has emerged as the third-largest producer by volume and now stands as a major supplier of affordable medicines [9]. Platforms like UPI have demonstrated India's ability to build population-scale technology systems in the realm of digital public infrastructure. In space, Chandrayaan-3 has shown

[7] Report of the Working Group for the Twelfth Five Year Plan (2012–17): Programmes and Proposals for Twelfth Five Year Plan for the Department of Science and Technology," [Online]. Available: https://dst.gov.in/sites/default/files/11-wg_dst2905-report_0.pdf. [Accessed: Jul. 2, 2026].)

[8] Ministry of Science and Technology, Government of India, "Science, Technology and Innovation Policy 2013," Department of Science and Technology, New Delhi, India, Jan. 2013. [Online]. Available: https://dst.gov.in/sites/default/files/STI%20Policy%202013-English.pdf. [Accessed: Jul. 2, 2026].

[9] Press Information Bureau, Government of India, "India's Pharmaceuticals in Global Healthcare: 'From Domestic Production to International Markets,'" Press Information Bureau, Mar. 21, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2243248&lang=2&reg=3. [Accessed: Jul. 5, 2026.

India's end-to-end capability in safe landing and roving on the lunar surface [10]. India has also showcased strong capability through the Mars Orbiter Mission, which made India one of the few countries to reach Mars orbit [11].

The institutional foundations, policy choices, and technological capabilities built over the past decades have positioned India to lead in emerging technologies. These include artificial intelligence, semiconductors, quantum technologies, green hydrogen, deep-ocean research, cyber-physical systems, and climate technologies. Chapter 4, on mission and policies, discusses these in detail.

India's upcoming S&T journey signals the country's strength, resilience, and future aspirations. It shows that India has consistently used science and technology for long-term growth, welfare, sovereignty, and transformation at a population scale.

[10] Chandrayaan-3 Details," ISRO, 2023. [Online]. Available: https://www.isro.gov.in/Chandrayaan3_Details.html [Accessed: Jul. 5, 2026].)

[11] Indian Space Research Organisation, "Mars Orbiter Mission," ISRO, 2023. [Online]. Available: https://www.isro.gov.in/MarsOrbiterMissionSpacecraft.html . [Accessed: Jul. 7, 2026].

Abbreviations

AI
Artificial Intelligence

CSIR
Council of Scientific and Industrial Research

ICAR
Indian Council of Agricultural Research

IIT
Indian Institute of Technology

INCOSPAR
Indian National Committee for Space Research

ISRO
Indian Space Research Organisation

R&D
Research and Development

S&T
Science and Technology

STI
Science, Technology, and Innovation

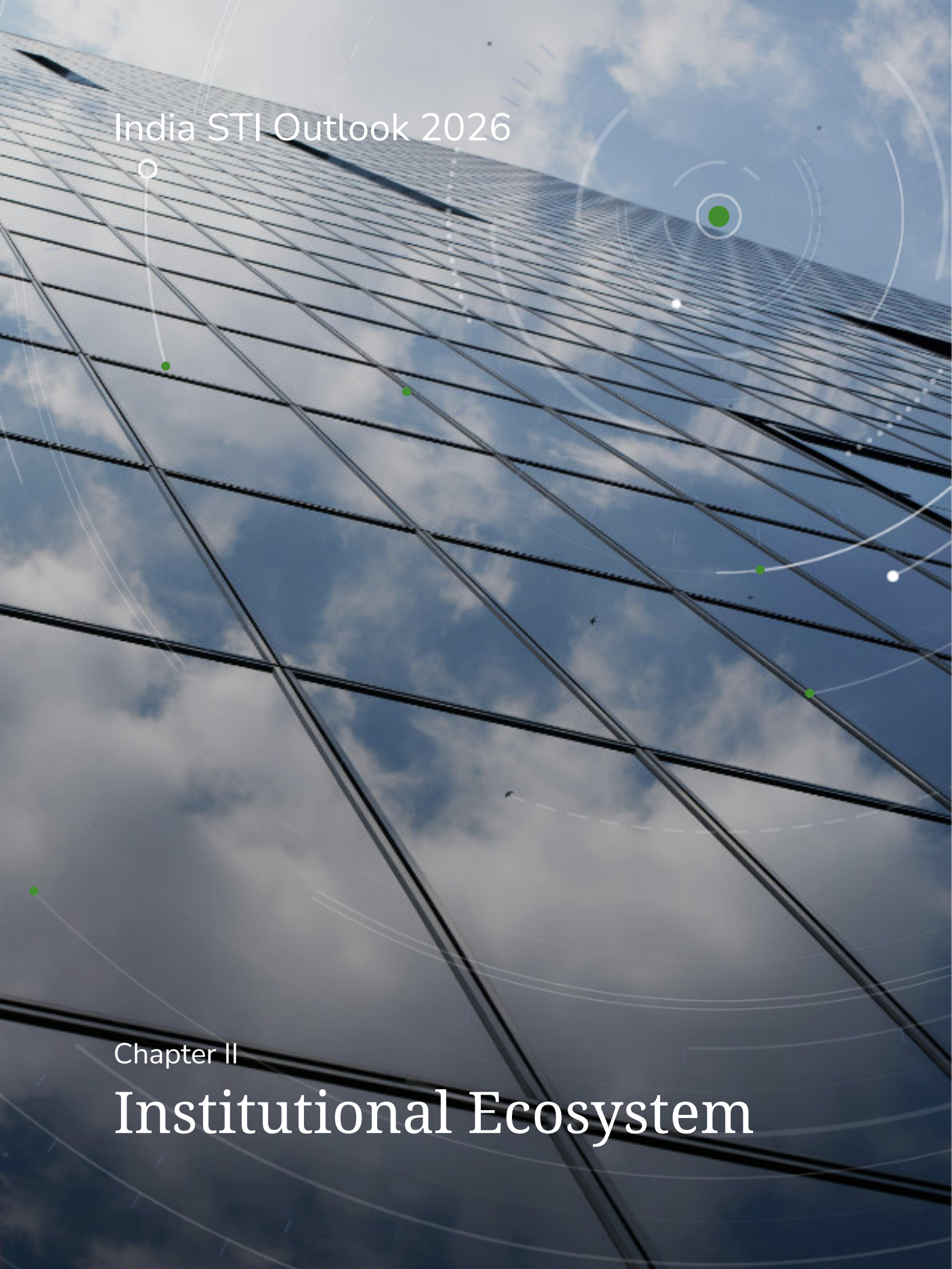
STIP
Science, Technology and Innovation Policy

UPI
Unified Payments Interface

Figures

Fig 1
Timeline of milestones in India's S&T foundation

Fig 2
Timeline of milestones in India's S&T policy (1958-2013)



India STI Outlook 2026

Chapter II

Institutional Ecosystem

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

India's Science, Technology and Innovation (STI) institutional landscape comprises a multi-layered architecture of governance bodies, advisory councils, industry associations, scientific councils (both at the central and state level) and innovation intermediaries that collectively shape India’s scientific ecosystem. This chapter provides a structured mapping of this ecosystem, organised into seven categories: core S&T governance institutions, apex advisory bodies, sectoral ministries focusing on S&T, innovation intermediaries, state S&T agencies, national academies and industry bodies.

Outline

2.1 Apex Advisory Bodies **24**

I. Office of the Principal Scientific Adviser to the Government of India (OPSA) 24

II. National Institution for Transforming India (NITI Aayog) 25

III. National Security Council Secretariat (NSCS) 25

2.2 Science and Technology Ministries & Departments **26**

I. Department of Science and Technology (DST) 26

II. Department of Biotechnology (DBT) 30

III. Department of Scientific and Industrial Research (DSIR)/ Council of Scientific and Industrial Research (CSIR) 35

IV. Department of Atomic Energy (DAE) 37

V. Defence Research and Development Organisation (DRDO) 39

VI. Department of Space (DoS) 42

VII. Ministry of Earth Sciences (MoES) 44

VIII. Ministry of Electronics and Information Technology (MeitY) 46

IX. Department of Higher Education (DHE) 49

X. Department of Telecommunication (DoT) 50

XI. Scientific Councils 52

2.3 Sectoral Ministries Contributing to S&T Ecosystem **60**

I. Department for Promotion of Industry and Internal Trade (DPIIT) 60

II. Department of Pharmaceuticals 60

III. Ministry of AYUSH 61

IV. Ministry of Civil Aviation (MoCA) 61

V. Ministry of Environment, Forest and Climate Change 62

VI. Ministry of External Affairs (MEA) 62

VII. Ministry of Heavy Industries 62

VIII. Ministry of Mines 63

IX. Ministry of New and Renewable Energy (MNRE) 63

X. Ministry of Power 63

XI. Ministry of Textiles 64

2.4 Innovation Promotion Agencies 65

I. Atal Innovation Mission (AIM) 65

II. Startup India 65

2.5 State/UT S&T Agencies 66

2.6 National Academies 68

I. Indian National Science Academy (INSA) 68

II. Indian Academy of Sciences (IASc) 68

III. National Academy of Sciences, India (NASI) 68

IV. Indian National Academy of Engineering (INAE) 69

V. National Academy of Biological Sciences (NABS) 69

VI. National Academy of Medical Sciences (NAMS) 69

VII. National Environmental Science Academy (NESA) 69

VIII. National Academy of Agricultural Sciences (NAAS) 70

2.7 Industry Bodies 71

I. Multi-Sectoral Industry Associations 71

II. Sector Specific Associations 71

Abbreviations 72

Figures 76

Table 77

Advisory Bodies

- Office of the Principal Scientific Adviser to the Government of India
- NITI Aayog
- National Security Council Secretariat

Scientific Councils

- Indian Council of Medical Research
- Indian Council of Agricultural Research

Sectoral Ministries with Significant S&T Mandate

- Department for Promotion of Industry and Internal Trade
- Department of Pharmaceuticals
- Ministry of AYUSH
- Ministry of Civil Aviation
- Ministry of Environment, Forest and Climate Change

Innovation Promotion Agencies

- Startup India
- Atal Innovation Mission

Industry Associations

- Multi-sectoral Associations
- Sector-specific Associations

*For details of the Associations, refer to Section 2.7

Fig 1: Representation of the STI Architecture in India
Source: Compiled by contributors from the Office of the Principal Scientific Adviser to the Government of India

Key S&T Ministries & Departments

- Department of Science & Technology
- Department of Biotechnology
- Department of Scientific & Industrial Research
- Department of Atomic Energy
- Defence Research and Development Organisation
- Department of Space
- Ministry of Earth Sciences
- Ministry of Electronics and Information Technology
- Department of Higher Education
- Department of Telecommunication

- Indian Council of Science Research
- Indian Council of Forestry Research and Education

- Ministry of External Affairs
- Ministry of Heavy Industries
- Ministry of Mines
- Ministry of New and Renewable
- Ministry of Power
- Ministry of Textiles

National Acadmies

- Indian National Science Academy
- Indian Academy of Sciences
- National Academy of Sciences, India
- Indian National Academy of Engineering
- National Academy of Biological Sciences
- National Academy of Medical Sciences
- National Environmental Science Academy
- National Academy of Agricultural Sciences

State/UT S&T Agencies

*For details of the S&T agencies, refer to Section 2.5

2.1 Apex Advisory Bodies

The STI ecosystem is anchored by a set of key advisory bodies. These institutions serve as the primary advisory mechanisms for all STI related matters in India. They engage in a range of activities to promote the STI landscape in India - from promoting research, preparing policy frameworks and national security apparatus.

The key institutions within this category are outlined below:

I. Office of the Principal Scientific Adviser to the Government of India (OPSA)

Point of Contact
Principal Scientific Adviser (PSA), office-psa@nic.in
Scientific Secretary, OPSA, secy@psa.gov.in

The Office of the Principal Scientific Adviser (OPSA) serves as the primary advisory body to the Prime Minister and the Cabinet on matters related to science and technology. The OPSA focuses on formulating and coordinating inter-ministerial S&T missions, promoting public-private partnership for research and innovation, and enabling preparedness in emerging science and technology domains. The office also engages in international science and technology engagements by providing strategic advice to the relevant stakeholders and contributing to India's technology diplomacy efforts.

Major Initiatives:

1. The Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC): The PM-STIAC is an overarching council that advises the Prime Minister on matters related to science and technology, based on the status of S&T activities, areas for future intervention, and the way forward. The PM-STIAC has shaped several flagship missions and initiatives, including the National Quantum Mission, the National One Health Mission, the National AI Mission, and the Mission on Deep Ocean Exploration.

2. Empowered Technology Group (ETG): The ETG is an institutional structure constituted to design, oversee, and coordinate national-level policies related to R&D and the induction and procurement of technologies. ETG operates on three pillars: procurement support, policy guidance, and R&D support. The group is also supported by the Technology Advisory Group (TAG), comprising 8 members from Academia and 9 members from Industry and other relevant sectors.

II. National Institution for Transforming India (NITI Aayog)

Point of Contact
Chief Executive Officer:
ceo-niti@gov.in
Member (S&T), NITI Aayog:
member.ak@niti.gov.in

NITI Aayog serves as the apex policy think tank of the Government of India. It focuses on establishing a long-term vision for India's development by setting national priorities and frameworks in partnership with states. From a policy perspective, the organisation monitors and evaluates programmes to assess impact, inform course correction and share knowledge. Additionally, it plays a pivotal role in capacity building and in garnering multi-stakeholder partnerships to create a development ecosystem within the country.

Major Initiatives:

1. NITI Frontier Tech Hub: The Frontier Tech Hub under NITI Aayog has been established to anticipate major technological shifts and analyse their implications. It includes frontiers such as AI, quantum, and biotechnology.

III. National Security Council Secretariat (NSCS)

Point of Contact
jssa-nscs@nic.in

The National Security Council Secretariat (NSCS) functions as the Government of India's core arm for national security decision-making.

Major Initiatives:

1. US-India TRUST initiative: Transforming the relationship utilising strategic technology (TRUST) was formalised in February 2025 between India and the USA. The initiative builds upon the focus areas, which were under iCET (Initiative on Critical and Emerging Technology), such as semiconductors, AI, and quantum. In addition to these, TRUST expands into domains such as critical mineral supply chains, biotechnology, energy, and space technologies.

2. India-UK Technology Security Initiative (TSI): The Technology Security Initiative (TSI)initiative is being coordinated by the NSAs of India and the UK as a strategic partnership focusing on critical and emerging technologies. The TSI initiative aims to build upon the bilateral cooperation agenda set out in the India-UK Roadmap 2030 by engaging in collaborative efforts across various technology domains.

2.2 Science and Technology Ministries & Departments

India's core S&T governance ecosystem is anchored by ministries and departments whose primary focus is the formulation and implementation of science, technology, and innovation policy. These bodies oversee national research priorities, administer funding mechanisms, and provide strategic direction to India's broader scientific enterprise. Apart from ministries and departments, scientific councils are also a vital part of the core S&T ecosystem.

The key institutions within this category are outlined below:

I. Department of Science and Technology (DST)

Point of Contact
Secretary, Department of Science and Technology, : dstsec@nic.in

The Department of Science and Technology (DST) serves as the nodal agency for funding, coordinating, and promoting science and technology activities in the country. The department focuses on creating a science, technology, and innovation ecosystem that is collaborative, inclusive and aligns with the country's national aspirations. The department also emphasises grassroots-level development through state science technology councils and the application of science and technology for the underprivileged sections of society.

Budget: ₹ 11,922 crore [FY 2025-2026]*

Major Initiatives:

1. National Quantum Mission (NQM): The NQM was launched in April 2023 with a financial outlay of ₹ 6,003 crores. The mission targets four technology verticals under quantum science and technology: (i) Quantum computing, (ii) Quantum communication and cryptography, (iii) Quantum sensing and metrology, and (iv) Quantum Materials and Devices. Each of these verticals has a designated thematic hub (T-Hub) that serves as a host research institution working towards development and research within its vertical.

2. National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS): NM-ICPS was launched in 2018 with a budget of ₹ 3,660 crore. The primary aim of NM-ICPS is to develop advanced Cyber-Physical Systems (CPS) technologies and to promote translational research. Under NM-ICPS, 25 technology innovation hubs (TIHs) have been established, each assigned a technology vertical in areas such as cybersecurity,

*The DST Budget also includes the budgetary provisions for ANRF, RDI Fund and TDB.

AI and Machine learning, robotics, and advanced communication systems. The mission, by conducting R&D, product development, and commercialisation, and by supporting startups, aims to fulfil its objectives.

3. National Geospatial Policy 2022: The policy was notified in December 2022 to democratise and liberalise access to geospatial data. The policy serves as a strategic roadmap for developing geospatial infrastructure, services, and platforms in the country. It mentions specific objectives across three predefined timelines, 2025, 2030, and 2035, for India's geospatial ecosystem development. In 2025, the government also allocated ₹ 100 crore for the National Geospatial Mission to develop foundational geospatial infrastructure and data by leveraging the PM Gati Shakti initiative.

Research Institutions under the department: DST has several research institutions under its mandate, each focusing on different aspects of science and technology. The table below lists such institutions along with the contact details of the point of contact.

S.No.	Name of the Institution	Point of Contact
1	MACS-Agharkar Research Institute (ARI)	Director - director@aripune.org
2	Aryabhata Research Institute of Observational Sciences	Director - directoraries@aries.res.in
3	Birbal Sahni Institute of Palaeosciences (BSIP)	Director - director@bsip.res.in
4	Bose Institute (BI)	Director - director@jcbose.ac.in
5	Centre for Nano and Soft Matter Sciences (CeNS)	Director - director@cens.res.in
6	Indian Association for the Cultivation of Science (IACS)	Director - director@iacs.res.in
7	Institute of Nano Science and Technology (INST)	Director - director@inst.ac.in
8	Institute of Advanced Study in Science and Technology (IASST)	Director - dir.iasst@nic.in
9	Indian Institute of Astrophysics (IIA)	Director - diriia@iiap.res.in
10	Indian Institute of Geomagnetism (IIG)	Director - iig.director@iigm.res.in
11	International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)	Director - director@arci.res.in
12	Jawaharlal Nehru Centre for Advanced Scientific Research	admin@jncasr.ac.in
13	Raman Research Institute (RRI)	Director - director@rri.res.in
14	Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST)	Director - director@sctimst.ac.in
15	S. N. Bose National Centre for Basic Sciences (SNB)	Director - director@bose.res.in
16	Wadia Institute of Himalayan Geology (WIHG)	Director - director@wihg.res.in
17	North East Centre for Technology Application and Research (NECTAR)	Director General - dg.nectar@nectar.org.in
18	National Innovation Foundation-India (NIF)	Director - director@nifindia.org

Table 1: List of Research Institutions under DST with their PoC. **Source**: Autonomous S&T & Attached Institutions (Accessed on February 23, 2026) | Department of Science & Technology | India.; Internal Team Compilation)

Apart from research institutions, some sector-specific attached institutions are listed as below:

S.No.	Name of the Institution	Point of Contact
1	National Atlas and Thematic Mapping Organisation	Director - dir.natmo@nic.in
2	Survey of India	Surveyor General of India - sgo.soi@gov.in

Table 2: List of Attached Institutions under DST (Service Organisations) with their PoC. **Source**: Attached Institutions (Accessed on February 23, 2026) | Department of Science & Technology | India.

I.A Anusandhan National Research Foundation (ANRF)

Point of Contact
Chief Executive Officer, Anusandhan National Research Foundation: ceo@anrf.gov.in

ANRF was established in 2023 to provide strategic direction for research and innovation in the fields of natural sciences, including engineering and technology, environmental and earth sciences, mathematical sciences, and health and agriculture. ANRF, through its various programmes, focuses on fostering a culture of innovation across universities and research institutions and promotes cross-industrial collaborations.

Major Initiatives:

1. ANRF Translational Research and Innovation (ATRI) Initiative: The ATRI initiative focuses on translating promising research into market-ready products. Through its centres, the initiative provides support for potential technologies from laboratory-scale validation (TRL4) to prototype demonstration in an operational environment (TRL7), helping them reach eventual commercialisation.

2. ANRF Mission AI for Science and Engineering (AI-SE): The mission focuses on positioning AI as a core enabler within the country's science and engineering ecosystem. For accelerated innovation and discovery, it supports advancements in domain-specific models, foundational AI methods, and infrastructure. The mission has four specific programs under its umbrella: AI for Science and Science of AI; AI for Engineering Design and Accelerated Materials Development; AI for Weather and Climate Modelling; and AI for Bio and Life Science. Additionally, it conducts open-source contests to promote AI in the mentioned domains.

3. Critical Raw Materials Research Program: The CRM research program aims to advance scientific and industrial R&D to establish a research ecosystem for critical raw materials in India. The program will provide financial and research support to nine COEs under the National Critical Mineral Mission, anchored by the Ministry of Mines, via a hub-and-spoke model.

4. Mission for Advancement in High Impact Areas (MAHA) - MedTech Mission: The MAHA MedTech Mission focuses primarily on developing and commercialising high-

quality, affordable medical technologies. The mission is launched for a period of 5 years with a total financial outlay of ₹ 750 crores.

5. Mission for Advancement in High Impact Areas (MAHA) - EV Mission: The MAHA EV Mission promotes research and development in electric vehicles to advance their adoption in the country. The mission has three focus technology verticals: tropical EV battery and battery cells, power electronics, machines and drives, and EV charging infrastructure. For each of these verticals, e-nodes will be established, which are essentially research institutions responsible for development and research within each vertical.

I.B Research, Development and Innovation Fund (RDI Fund)

Point of Contact
rdi-fund@anrf.gov.in

The RDI Fund was announced on 1st July 2025, with a total financial outlay of ₹ 1 lakh crore for the period of six years. The fund is being administered by the Ministry of Science and Technology, with its operationalisation carried out by the Department of Science and Technology. The fund will be implemented by the Anusandhan National Research Foundation, with the Technology Development Board (TDB) and the Biotechnology Industry Research Assistance Council (BIRAC) acting as second-level fund managers. The fund encourages private sector participation to scale funding for emerging technology sectors, along with providing support for the acquisition of critical technologies. Additionally, it also includes the establishment of a dedicated deep tech startup fund.

The TDB has approved 22 projects involving a total project cost of ₹4,744 crore, with RDI Fund support of ₹2,192 crore. BIRAC has shortlisted 8 projects involving ₹390.35 crore for support under the RDI Scheme [12].

Sunrise Sectors identified for funding:

- Energy security and transition, and climate action
- Deep-technology, including quantum computing, robotics and space
- AI and its application in agriculture, health and education
- Biotechnology, biomanufacturing, synthetic biology, pharma, medical devices
- Digital economy, including Digital agriculture and the digital economy.

[12] Ministry of Science & Technology, "PARLIAMENT QUESTION: RESEARCH DEVELOPMENT AND INNOVATION SCHEME," Press Information Bureau, Government of India, Jul. 29, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2291145&reg=48&lang=2. [Accessed: Aug. 10, 2026].

I.C Technology Development Board (TDB)

Point of Contact
Secretary, Technology Development Board:
secretary@tdb.gov.in

The Technology Development Board was constituted in 1996, under the Technology Development Board Act, 1995, as a statutory body. TDB advances the commercialisation and development of indigenous technologies and assists in the adaptation of imported technologies. To do so, it provides financial assistance to industrial bodies and other agencies in the country.

TDB Core Funding Mechanism: TDB provides financial assistance to industrial concerns and other agencies in the form of loans, equity, and grants. It provides a soft loan at 5% simple interest rate per annum to industries, along with further financial assistance as 50% of the unincurred project cost. In terms of equity capital, the board provides assistance upto 25% of the approved project cost, provided such investment does not exceed the capital paid up by the promoters. Grants by the board are also provided in exceptional cases that align with the national interest.

TDB as Second-Level Fund Manager (SLFM) - RDIF: RDI funds will also be provided through TDB, which is serving as the second-level fund manager of the scheme. These funds will be given to eligible technology entities and startups to scale up R&D beyond TRL4. Unlike TDB's own funding mechanism, this scheme will not provide grants or short-term loans.

II. Department of Biotechnology (DBT)

Point of Contact
Secretary,
Department of Biotechnology
secy.dbt@nic.in

The Department of Biotechnology (DBT) is the nodal agency of the Government of India promoting research, innovation, capacity building and entrepreneurship in life sciences and biotechnology. The DBT is committed to support the National Development Programmes (NDPs) and advancing the Sustainable Development Goals (SDGs) through the deployment of biotechnology tools and technologies that address the problems of agricultural productivity, food production, nutrition security, healthcare and environmental sustainability.

Budget: ₹ 2,830 crore [FY 2025-2026]*

Major Activities/Initiatives:

1. BioE3 (Biotechnology for Economy, Environment and Employment) Policy: Department of Biotechnology (DBT) with the approval of the Cabinet is implementing the BioE3 (Biotechnology for Economy, Environment and Employment) policy for "Fostering

*The DBT Budget also includes the budgetary provisions for BIRAC.

High-performance Biomanufacturing" along with BIRAC. It focuses on reimagining health, food and energy requirements through bio-based processes and systems reducing chemical inputs. Towards this, Bio-enablers such as Bio-AI Hubs, Bio foundries, and Biomanufacturing Hubs are being established across the country. In 2025, under the policy, India launched its first national biofoundry network.

2. Capacity Building: DBT implements several programmes to strengthen human resource development, skill-building and research infrastructure in biotechnology and life sciences. These include national fellowships (Tata Innovation Fellowship, M K Bhan Young Researchers Fellowship Programme etc.), Postgraduate (DBT-PG) teaching programme, doctoral and postdoctoral training, and international research collaborations (Khorana programme, DBT-TWAS etc.) to nurture skilled scientific talent. Through initiatives such as DBT-BUILDER and DBT-SAHAJ, the Department also strengthens institutional infrastructure and facilitates access to advanced research facilities.

3. Health Interventions: DBT promotes healthcare and medical biotechnology to develop affordable, quality healthcare solutions and address major health challenges, including infectious diseases, antimicrobial resistance, cancer, genetic disorders and lifestyle diseases. Its initiatives support research and development in vaccines, drugs, diagnostics, medical devices, genome editing, stem cells and regenerative medicine. The National Biopharma Mission strengthens industry–academia collaboration and advances indigenous biopharmaceutical products, including vaccines, biosimilars and diagnostic kits.

4. Agriculture Biotechnology: DBT supports advanced technologies, including genomics, proteomics, transgenics and genome editing, to develop improved crop varieties and climate-resilient solutions. Through the formulation of the "Guidelines for Safety Assessment of Genome Edited Plants, 2022" many new plant varieties are being developed for increasing our agricultural productivity.

5. International Collaborations: The Department fosters partnerships to strengthen science diplomacy, accelerate innovation and advance research in biotechnology and life sciences. It supports bilateral partnerships with countries such as Australia, the UK, the USA, Germany, Switzerland and Sweden, alongside multilateral collaborations. Notable alliances are with Wellcome Trust including a centre in India (DBT India Alliance) for promoting biomedical research careers, EMBO, G20, EU Horizon and BRICS.

6. Artificial Intelligence (AI) and Big Data: DBT promotes theoretical and computational biology by integrating bioinformatics, mathematical modelling, artificial intelligence (AI), machine learning and big data analytics to advance biological and biomedical research. The Indian Biological Data Centre (IBDC), India's first national repository for life-science data generated through publicly funded research, facilitates the archiving, management and sharing of biological data.

II. A Research Institutions under the Department

DBT supports two Autonomous Research Organisations - BRIC (Biotechnology Research and Innovation Council) and RCB (Regional Centre for Biotechnology) and hosts one Intergovernmental International organisation - ICGEB (International Centre for Genetic Engineering and Biotechnology).

II.A.1 Biotechnology Research and Innovation Council (BRIC)

Point of Contact
Nodal Officer
k.ganesan@nic.in

Scan QR to access i3C BRIC-RCB PhD program website

BRIC is an autonomous body created by the DBT as the largest network of elite biological research institutions of India. BRIC is a collective initiative synergising institutional strengths of distinct research mandates for enhancing impact through Biotech research and innovation. Many new initiatives like development of integrated large research networks for development of precision therapeutics, genomic sequencing as well as networked PhD program – i3C BRIC-RCB PhD programme are being successfully undertaken.

The table below lists the institutions of BRIC along with details of their POC.

S.No.	Name of the Institution	Point of Contact
1	BRIC - Centre for DNA Fingerprinting and Diagnostics	Director - director@cdfd.org.in
2	BRIC - Institute for Stem Cell Science and Regenerative Medicine	Director - director@instem.res.in
3	BRIC - Institute of Bioresources and Sustainable Development	Director - director.ibsd@nic.in
4	BRIC - Institute of Life Sciences	Director - director@ils.res.in
5	BRIC - National Agri-Food and Biomanufacturing Institute	Director - edoffice@nabi.res.in
6	BRIC - National Brain Research Centre	Director - director@nbrc.ac.in
7	BRIC - National Centre for Cell Sciences	Executive Director - director@nccs.res.in
8	BRIC - National Institute of Animal Biotechnology	Director - director@niab.org.in
9	BRIC - National Institute of Biomedical Genomics	Director - director@nibmg.ac.in
10	BRIC - National Institute of Immunology	Director - director@nii.ac.in
11	BRIC - National Institute of Plant Genome Research	Director - director@nipgr.ac.in
12	BRIC - Rajiv Gandhi Centre for Biotechnology	Director - director@rgcb.res.in
13	BRIC - Translational Health Science and Technology Institute	Executive Director - ed@thsti.res.in

Table 3: List of institutions under BRIC with their PoC. Source: Department of Biotechnology, Government of India.

II.A.2 Regional Centre for Biotechnology (RCB), Faridabad

Point of Contact
Executive Director
arvindsahu@rcb.res.in

Regional Centre for Biotechnology (RCB), Faridabad is an Institution of National Importance created through an Act of Parliament by the DBT.

II.A.3 International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi

Point of Contact
Director
icgeb.director@gmail.com

International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi is an intergovernmental international organization undertaking cutting edge research in diverse biological fields.

II.B. Public Sector Undertakings (PSUs) under the department

There are 2 PSUs under DBT. The table below lists these public enterprises.

S.No.	Name of the Institution
1	Biotechnology Industry Research Assistance Council (BIRAC)
2	Indian Vaccine Corporation Ltd (IVCOL)

Table 4: List of PSUs under DBT. **Source**: Department of Biotechnology | India.

II.B.1 Biotechnology Industry Research Assistance Council (BIRAC)

Point of Contact
Managing Director,
Biotechnology Industry Research Assistance Council (BIRAC)
md@birac.nic.in

BIRAC is a not-for-profit Section 8, Schedule B, Public Sector Enterprise, set up by DBT. BIRAC's mandate is to strengthen and empower the emerging Biotech enterprises. The organization is committed to promote, nurture and enable the Biotech Innovation Ecosystem for development of globally competitive affordable products to address the unmet needs of society at large.

Major Initiatives:

1. BioIncubators Nurturing Entrepreneurship for Scaling Technologies (Bio-NEST): supports the establishment of biotechnology incubation centres to promote innovation, entrepreneurship, and technology commercialization across the country.
2. Empowering Youth for Undertaking Value Added Innovative Translational Research (E-YUVA): supports the establishment of pre-incubation centres in academic institutions to nurture innovation among students and young researchers through mentoring, training, and translational research support.

3. Social Innovation programme for Products Affordable & Relevant to Societal Health (SPARSH): aimed at addressing critical societal challenges through biotechnological interventions. Since its inception, SPARSH has supported high-impact innovations targeting neglected and unmet needs across different thematic areas.

4. Promoting Academic Research Conversion to Enterprise (PACE): supports and encourages academia to develop technologies and products in the field of biotechnology. The initiative has two components: Academic Innovation Research (AIR) and Contract Research Scheme (CRS).

5. Biotechnology Ignition Grant (BIG): flagship initiative of BIRAC, aimed at supporting young startups and entrepreneurs by providing a grant of up to ₹ 50 lakh for a period of 18 months to facilitate the translation of their innovative ideas into proof-of-concept. It is implemented through a network of eight BIG Partners, BIRAC's leading BioNEST bioincubators. To date, the BIG scheme has received close to 15,000 applications and has supported more than 1,000 innovative ideas, committing more than ₹ 500 crore, including support to nearly 50 projects from the North Eastern Region (NER).

6. Small Business Innovation Research Initiative (SBIRI): supports early-stage validation by enabling grantees to advance established PoCs toward product and technology development up to TRL 6. It addresses a critical gap in the innovation pipeline by facilitating development and initial validation.

7. Biotechnology Industry Partnership Program (BIPP): supports late-stage validation and pre-commercialization of high-risk innovations at TRL 7 and above. The scheme operates on a cost-sharing model between BIRAC and industry partners, enabling scaling and commercialization.

8. BIRAC as Second-Level Fund Manager (SLFM) - RDIF: RDI funds will also be provided through BIRAC, which is serving as the second-level fund manager of the scheme. These funds will be given to eligible technology entities and startups to scale up R&D beyond TRL4.

II.B.2 Indian Vaccine Corporation Ltd (IVCOL)

IVCOL was incorporated as a Joint Venture Company promoted by DBT; Pasteur Meraux Serum & Vaccines (PMSV) France; and Indian Petrochemicals Corporation Ltd. (IPCL merged with the Reliance Industries Limited in 2007) with the objectives of manufacturing:

(i) Vaccines based on Vero cell Technology and

(ii) Injectable Polio Vaccines (IPV).

III. Department of Scientific and Industrial Research (DSIR)/ Council of Scientific and Industrial Research (CSIR)

The Department of Scientific and Industrial Research (DSIR) is primarily focused on innovation, industrial research and development of indigenous technologies. It actively collaborates with industry, academic institutions, research organisations, and government agencies to nurture a robust, innovation-led ecosystem.

Budget: ₹ 6,433 crore [FY 2025-2026]

Research Institutions under CSIR: CSIR has research institutes and labs that focus on specific areas of research aligned with their mandates. The table below lists the names and points of contact for these labs and institutes.

S.No.	Name of the Institution	Point of Contact
1	CSIR-Advanced Materials and Processes Research Institute (CSIR-AMPRI)	Director - director.ampri@csir.res.in
2	CSIR-Central Building Research Institute (CSIR-CBRI)	Director - director.cbri@csir.res.in
3	Centre for Cellular and Molecular Biology (CSIR-CCMB)	Director - director@ccmb.res.in
4	CSIR-Central Drug Research Institute (CSIR-CDRI)	Director - director_office@cdri.res.in
5	CSIR-Central Electrochemical Research Institute (CSIR-CECRI)	Director - director@cecri.res.in
6	CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI)	Director - director.ceeri@csir.res.in
7	CSIR-Central Food Technological Research Institute (CSIR-CFTRI)	Director - director.cftri@csir.res.in
8	Central Glass and Ceramic Research Institute (CSIR-CGCRI)	Director - dir_office@cgcri.res.in
9	CSIR-Central Institute of Medicinal Aromatic Plants (CSIR-CIMAP)	Director - director@cimap.res.in
10	CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR)	Director - director.cimfr@csir.res.in
11	CSIR-Central Leather Research Institute (CSIR-CLRI)	Director - director.clri@csir.res.in
12	CSIR-Central Mechanical Engineering Research Institute (CSIR-CMERI)	Director - murmu.cmeri@csir.res.in
13	CSIR-Central Road Research Institute (CSIR-CRRI)	director.crri@nic.in
14	CSIR-Central Scientific Instruments Organisation (CSIR-CSIO)	Director - director.csio@csir.res.in

S.No.	Name of the Institution	Point of Contact
15	CSIR-Central Salt Marine Chemicals Research Institute (CSIR-CSMCRI)	Director - director@csmcri.res.in
16	CSIR-National Institute of Data Science & AI (CSIR-NIDSA)	Director - directors@csir4pi.in
17	CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB)	Director - director@igib.res.in
18	CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT)	Director - director.ihbt@csir.res.in
19	CSIR-Indian Institute of Chemical Biology (CSIR-IICB)	Director - director@iicb.res.in
20	CSIR-Indian Institute of Chemical Technology (CSIR-IICT)	Director - director@iict.res.in
21	CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM)	Director - director.iiim@csir.res.in
22	CSIR-Indian Institute of Petroleum (CSIR-IIP)	Director - director@iip.res.in
23	CSIR-Indian Institute of Toxicology Research (CSIR-IITR)	Director - director@iitrindia.org
24	CSIR-Institute of Minerals and Materials Technology (CSIR-IMMT)	Director - dir@immt.res.in
25	CSIR-Institute of Microbial Technology (CSIR-IMTECH)	Director - director.imt@csir.res.in
26	CSIR-National Aerospace Laboratories (CSIR-NAL)	Director - director@nal.res.in
27	CSIR-National Botanical Research Institute (CSIR-NBRI)	Director - director.nbri@csir.res.in
28	CSIR-National Chemical Laboratory (CSIR-NCL)	Director- director.ncl@csir.res.in
29	CSIR-National Environmental Engineering Research Institute (CSIR-NEERI)	Director - director.neeri@csir.res.in
30	CSIR-North - East Institute of Science and Technology (CSIR-NEIST)	Director - director.neist@csir.res.in
31	CSIR-National Geophysical Research Institute (CSIR-NGRI)	Director - director.ngri@csir.res.in
32	National Institute for Inter-disciplinary Science and Technology (CSIR-NIIST)	Director - director@niist.res.in
33	CSIR-National Institute of Oceanography (CSIR-NIO)	Director - director@nio.res.in
34	CSIR-National Metallurgical Laboratory (CSIR-NML)	Director - director.nml@csir.res.in
35	CSIR-National Physical Laboratory (CSIR-NPL)	Director - director.nplindia@csir.res.in
36	CSIR-National Institute of Science Communication & Policy Research (CSIR-NIScPR)	Director - director@niscpr.res.in
37	CSIR-Structural Engineering Research Centre (CSIR-SERC)	Director - director@serc.res.in

Table 5: List of CSIR Labs and Research Institutes along with their respective PoCs (Source: CSIR Labs (Accessed on February 23, 2026) | Council of Scientific & Industrial Research | India.)

Public Sector Undertakings (PSUs) under the department: The department has public sector enterprises (PSEs) relevant to research and development. The table below provides relevant information for the same:

S.No.	Name of the Institution	Point of Contact
1	Central Electronics Limited (CEL)	Chairman and Managing Director - cmd@celindia.co.in
2	National Research Development Corporation (NRDC)	Chairman and Managing Director - cmdnrdc@nrdc.in

Table 6: List of PSUs under DSIR with their PoC
(Source: Our Organisation (Accessed on February 23, 2026) | Department of Scientific and Industrial Research | India.)

Note: The DST, DSIR and DBT together form the Ministry of Science and Technology (MoST). The MoST, through its three departments, oversees the S&T ecosystem in India.

IV. Department of Atomic Energy (DAE)

Point of Contact
Secretary,
Department of Atomic Energy, and Chairman,
Atomic Energy Commission
chairman@dae.gov.in

The Department of Atomic Energy (DAE) is mandated to empower the nation through nuclear and advanced technologies, driving energy independence and innovation. It focuses on expanding nuclear power and applying radiation technologies in health, agriculture and other domains. DAE's purpose is to strengthen national security and improve the quality of life by harnessing nuclear science for both strategic and developmental goals.

Budget: ₹ 24,411 crore [FY 2025-2026]

Major Initiatives:

1. The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Bill, 2025: The SHANTI Bill, 2025, was recently introduced to reform the nuclear energy sector. The integration of the private sector into the nuclear energy sector was one of the key reforms introduced in the bill. Apart from this, the bill establishes a structured system for licensing and safety oversight, provides a regulatory framework for non-power applications, and introduces a dispute resolution mechanism to facilitate dispute resolution. The bill also grants statutory recognition to the Atomic Energy Regulatory Board (AERB).

Research Institutions under the department: The DAE has various research institutions under its mandate that focus on specific areas of research and innovation within the nuclear energy domain. The table below lists all such institutions, along with their Point of Contact.

S.No.	Name of the Institution	Point of Contact
1	Bhabha Atomic Research Centre	Director - director@barc.gov.in
2	Indira Gandhi Centre for Atomic Research	Director - dir@igcar.gov.in
3	Raja Ramanna Centre for Advanced Technology	Director - director@rrcat.gov.in
4	Variable Energy Cyclotron Centre	Director - director@vecc.gov.in
5	Atomic Minerals Directorate for Exploration and Research	Director - director.amd@gov.in
6	Board of Radiation and Isotope Technology	Chief Executive - chief@britatom.gov.in
7	Heavy Water Board	Chief Administrative Officer - cao@mum.hwb.gov.in
8	Board of Research in Nuclear Sciences	helpdesk.brns@barc.gov.in
9	National Board for Higher Mathematics	Member Secretary - psmsnbhm@dae.gov.in
10	Tata Institute of Fundamental Research	Director - director@tifr.res.in
11	Saha Institute of Nuclear Physics	Director - director.sinp@saha.ac.in
12	Harish-Chandra Research Institute	Director - director@hri.res.in
13	Institute of Physics	Director - director@iopb.res.in
14	National Institute of Science Education and Research	Director - director@niser.ac.in
15	Institute of Mathematical Sciences	Director - director@imsc.res.in
16	Institute for Plasma Research	Director - director@ipr.res.in
17	Homi Bhabha National Institute	Dean - deanhbni@hbni.ac.in
18	Tata Memorial Centre	Director - director.tmc@tmc.gov.in
19	University of Mumbai-DAE Centre for Excellence in Basic Sciences	Director - director@cbs.ac.in
20	Global Centre for Nuclear Energy Partnership	Head - pd@gcnep.gov.in

Table 7: List of Research Institutions under DAE with details of their respective PoCs.
(Source: Organisation Structure (Accessed on March 3, 2026) | Department of Atomic Energy | India.)

The **Nuclear Fuel Complex** under the department is responsible for manufacturing nuclear fuel bundles for Pressurised Heavy Water Reactors (PHWR), Boiling Water Reactors (BWR), and Fast Breeder Reactors.

The **Atomic Energy Education Society** is an educational society established under the DAE in 1969. It provides quality education to the children of DAE employees till the junior college level.

Public Sector Undertakings (PSUs) under the department: There are 05 PSUs under DAE. The table below lists these public enterprises and their Point of Contact for reference.

S.No.	Name of the Institution	Point of Contact
1	Nuclear Power Corporation of India Ltd	Chairman & Managing Director - cmd@npcil.co.in
2	IREL (India) Limited	Corporate Office - contactus@irel.co.in
3	Uranium Corporation of India Ltd	asnani@uraniumcorp.in
4	Electronics Corporation of India Ltd	Chairman & Managing Director - cmd@ecil.co.in
5	Bharatiya Nabhikiya Vidyut Nigam Ltd	Corporate Office - bhavini@bhavini.in

Table 8: List of PSUs under DAE with their PoC
(Source: Organisation Structure (Accessed on March 3, 2026) | Department of Atomic Energy | India.)

V. Defence Research and Development Organisation (DRDO)

Point of Contact
Chairman,
Defence Research and Development Organisation
secydrdo@gov.in

The Defence Research and Development Organisation (DRDO) focuses primarily on providing cutting-edge defence technologies to the armed forces. It also provides technological solutions and actively participates in capacity-building to enhance combat effectiveness and build high-quality infrastructure.

Budget: ₹ 26,817 crore [FY 2025-2026]

Major Initiatives:

1. Technology Development Fund (TDF): The TDF scheme provides monetary support and expertise to upgrade and innovate existing products and processes. It focuses on improving the existing products/systems by enhancing their functionality and quality. Established to promote self-reliance in defence technologies, the scheme supports the development of futuristic technologies with defence applications.

2. National Defence R&D and Innovation Ecosystem: DRDO is strengthening the National Defence Research and Innovation Ecosystem through complementary mechanisms that connect academic expertise, industrial capabilities and the technological requirements of the Armed Forces. The Directorate of Futuristic Technology Management (DFTM), through its Grants-in-Aid support for Long-Term Directed Research and the network of DRDO Industry Academia - Centres of Excellence (DIA-CoEs), promotes collaborative research among DRDO laboratories, Academic Institutions, Industry and Start-ups in frontier and critical defence technologies,

including areas subject to technology denial. Complementing this effort, Extramural Research (ER) and the Research Boards - Naval Research Board (NRB), Armaments Research Board (ARMREB), Life Sciences Research Board (LSRB) and Aeronautics Research and Development Board (AR&DB)- support basic and exploratory research in defence-relevant scientific and engineering disciplines, nurturing new ideas, research talent and the knowledge base for future technological advances.

Research Labs under the organisation: DRDO has several research labs under its mandate that conduct research and drive innovation across various areas of defence technology. The table below lists all such labs along with their contact details.

S.No.	Name of the Research Lab	Point of Contact
1	Advanced Systems Laboratory	iig.asl@gov.in
2	Advanced Centre for Energetic	iig-acem@gov.in
3	Aerial Delivery Research and Development Establishment	iig.adrde@gov.in
4	Aeronautical Development Establishment	iig.ade@gov.in
5	Armament Research & Development Establishment	iig.arde@gov.in
6	Centre for Airborne Systems	iig.cabs@gov.in
7	Combat Aircraft System Development and Integration Centre	iig.cvrde@gov.in
8	Centre for Artificial Intelligence & Robotics	director.cair@gov.in
9	Centre for Fire, Explosive & Environment Safety	director.cfees@gov.in
10	Combat Vehicles Research & Development Estt.	director.cvrde@gov.in
11	Defence Electronics Applications Laboratory	iig.deal@gov.in
12	Defence Bioengineering and Electromedical Laboratory	director.debel@gov.in
13	Defence Electronics Research Laboratory	director.derl@gov.in
14	Defence Geoinformatics Research Establishment	director.dgre@gov.in
15	Defence Institute of Physiology and Allied Sciences	director.dipas@gov.in
16	Defence Institute of Psychological Research	director.dipr@gov.in
17	Defence Institute of High Altitude Research	director.dihar@gov.in
18	Defence Institute of Biodefence Technology	iig.dibt@gov.in
19	Defence Laboratory, Jodhpur	director.dlj@gov.in
20	Defence Materials and Stores Research & Development	iig.dmsrde@gov.in
21	Defence Metallurgical Research Laboratory	iig.dmrl@gov.in
22	Defence Research & Development Laboratory	iig.drdl@gov.in

S.No.	Name of the Research Lab	Point of Contact
23	Defence Research & Development Establishment	iig.drde@gov.in
24	Defence Research Laboratory	director.drl@gov.in
25	Defence Technologies and Test Centre	dttc-drdo@gov.in
26	Defence Young Scientist Laboratory - Artificial Intelligence	director.dysl-ai@gov.in
27	DRDO Young Scientists'Laboratory for Quantum Technologies	director.dysl-qt@gov.in
28	Electronics and Radar Development Establishment	director.lrde@gov.in
29	Gas Turbine Research Establishment	iig.gtre@gov.in
30	High Energy Materials Research Laboratory	director.hemrl@gov.in
31	Institute of Nuclear Medicine and Allied Sciences	director.inmas@gov.in
32	Institute for Systems Studies & Analyses	director.issa@gov.in
33	Instruments R&D Establishment	director.irde@gov.in
34	Integrated Test Range	director.itr@gov.in
35	Microwave Tube Research and Development Centre	iig.mtrdc@gov.in
36	Naval Materials Research Laboratory	director.nmrl@gov.in
37	Naval Physical & Oceanographic Laboratory	director.npol@gov.in
38	Naval Science & Technological Laboratory	iig.nstl@gov.in
39	Proof and Experimental Establishment	iig.pxe@gov.in
40	Research & Development Establishment (Engrs.)	director.rde@gov.in
41	Research Centre Imarat	iig-rci@gov.in
42	Scientific Analysis Group	director.sag@gov.in
43	Solid State Physics Laboratory	director.sspl@gov.in
44	Terminal Ballistics Research Laboratory	iig.tbrl@gov.in
45	Vehicle Research and Development Establishment	iig.vrde@gov.in

Table 9: List of DRDO research labs and centres with their PoC
(Source: SPOC IIG (Accessed on March 20, 2026) | Defence Research and Development Organisation | India.)

VI. Department of Space (DoS)

Point of Contact
Secretary,
Department of Space;
Chairman, Indian Space Research Organisation
chairmanoffice@isro.gov.in

Established in 1972, DOS formulates policies through the Space Commission and implements programmes through ISRO, PRL, NARL, NE-SAC, and IIST. IN-SPACe has been institutionalised under DoS as the Promotion and Authorisation centre to enable the private players and academia to participate in the space activities. NSIL and Antrix Corporation, under DOS, are responsible as the commercial wings of the DoS.

Budget: ₹ 12,449 crore [FY 2025-2026]

Major Initiatives:

1. Indian Space Policy 2023: The Indian Space Policy 2023, also referred to as the New Space Policy, was released by the Government to facilitate the involvement of private enterprises to undertake end-to-end activities in the space sector. The policy envisions ISRO, as the National Space Agency, will focus primarily on research and development of new space technologies and applications, and for expanding the human understanding of outer space.

2. Gaganyaan Project: The ISRO's Gaganyaan is an upcoming human spaceflight mission aimed at demonstrating the indigenous capability to send humans into Low Earth Orbit (LEO). As a foundational step, it proposes placing a crew of three in LEO for a short-duration mission and safely returning them to Earth. As a prospective programme, Gaganyaan is expected to lay the groundwork for a sustained human space exploration ecosystem, enabling advanced technologies and scientific experiments in microgravity.

3. Lunar and Venusian Exploration: ISRO is gearing up for the Chandrayaan-4, Chandrayaan-5 / LuPEX, and Venus Orbiter Mission (VOM), all slated within year 2028 time-frame. The Chandrayaan-4 will be a sample-return mission from the Moon, while the Chandrayaan-5/ LuPEX mission will be a collaboration with the Japanese space agency JAXA to explore the lunar polar volatiles, including lunar water-ice, in the vicinity of a Permanently Shadowed Region (PSR) of the Moon. The VOM will be an orbiter mission to Venus, to study the planet's surface, subsurface, atmosphere, ionosphere and the Sun-Venus interaction. These missions are ISRO's immediate focus for the scientific exploration of the solar system.

Research Centres and Labs under ISRO: ISRO research centres and labs focus on specific areas within the space sciences and technology domain. The table below lists these centres and labs along with their respective PoC.

*The DoS budget also includes the budgetary provisions for IN-SPACE and NSIL.

S.No.	Name of the Centre	Point of Contact
1	Indian Institute of Remote Sensing (IIRS)	Director - director@iirs.gov.in
2	Laboratory for Electro-Optics Systems (LEOS)	Director - director@leos.gov.in
3	Master Control Facility (MCF)	Director - director@mcf.gov.in
4	ISRO Telemetry Tracking and Command Network (ISTRAC)	Director - director@istrac.gov.in
5	ISRO Inertial Systems Unit (IISU)	Director - iisu_director_office@vssc.gov.in
6	ISRO Propulsion Complex (IPRC)	Director - director@iprc.gov.in
7	Human Space Flight Centre	director-hsfc@isro.gov.in
8	National Remote Sensing Centre	Director - director@nrsc.gov.in
9	Space Applications Centre	Director - director@sac.isro.gov.in
10	U R Rao Satellite Centre (URSC) /	Director - director@ursc.gov.in
11	Satish Dhawan Space Centre (SDSC)	Director - director@shar.gov.in
12	Liquid Propulsion Systems Centre (LPSC)	Director - director@lpsc.gov.in
13	Vikram Sarabhai Space Centre (VSSC)	Director - director@vssc.gov.in

Table 10: List of all research centres under ISRO, along with their respective PoC
(Source: DoS Centres/ Units (Accessed on March 02, 2026) | Indian Space Research Organisation | India.)

Research Bodies under the Department of Space: Under the Department of Space (DoS), several autonomous bodies primarily have research and development as their core mandate across various areas of space science and technology. The tables below list these organisations and their respective points of contact.

S.No.	Name of the Autonomous Body	Point of Contact
1	Physical Research Laboratory	Director - director@prl.res.in
2	National Atmospheric Research Laboratory	Director - director@narl.gov.in
3	North Eastern-Space Applications Centre	Director - director@nesac.gov.in
4	Indian Institute of Space Science and Technology	Director - director@iist.ac.in

Table 11: List of Affiliated Bodies under DoS with PoC
(Source: Organisation (Accessed on March 02, 2026) | Indian Space Research Organisation | India.)

VI.A Indian National Space Promotion and Authorisation Centre (IN-SPACe)

Point of Contact
Chairman, IN-SPACe
chairman@inspace.gov.in

IN-SPACe is an independent organisation that operates under the Department of Space. IN-SPACe aims to support the private sector by providing a streamlined system for regulatory and promotional assistance, as well as access to ISRO (Indian Space Research Organisation) facilities for space-related activities. The overall objective of IN-SPACe is to create a viable and competitive commercial space sector in India.

Major Initiatives:

1. Technology Adoption Fund (TAF): TAF is a funding mechanism designed to promote innovation and commercialisation of cutting-edge space technologies. The fund has been instituted with a total funding of ₹ 500 crore. In terms of project costs, the fund shall provide funding 60% in case of startups and 40% in case of large industries of the overall project cost.

VI.B NewSpace India Ltd. (NSIL)

Point of Contact
Chairman and Managing Director, NSIL
cmd@nsilindia.co.in

It was established as the CPSE, incorporated under the Department of Space. The company focuses on commercially enabling the use of ISRO's space-related products and services. These include launch services, satellite manufacturing and launch, provision of satellite data or services, and technology transfer to the industry.

VII. Ministry of Earth Sciences (MoES)

Point of Contact
Secretary,
Ministry of Earth Sciences
secretary@moes.gov.in

The Ministry of Earth Sciences (MoES) is responsible for providing services related to ocean and coastal state, hydrology, seismology, and weather and climate. The ministry is also mandated to provide information and services related to natural hazards, along with harnessing non-living and marine living resources in a sustainable manner. Explorations and international collaborations relating to the three poles - the Arctic, the Antarctic and the Himalayas, also fall under the ministry.

Budget: ₹ 3,380 crore [FY 2025-2026]

Major Initiatives:

1. Deep Ocean Mission: The Deep Ocean Mission focuses on exploring ocean resources and developing deep-sea technologies for their sustainable use. The mission is being implemented over a 5-year period in phases, with a financial outlay of ₹ 4,077 crore. The mission has seven key components under its mandate, including the development of technologies for deep-sea mining, deep-ocean survey and exploration, energy and freshwater from the ocean, and ocean climate change advisory services.

2. Mission Mausam: Mission Mausam is a flagship mission of MOES aimed at making India climate-smart and weather-ready. The mission focuses on developing advanced technologies to improve observation and forecasting, strengthening India's climate resilience. This includes development and integration of satellites with advanced instrument payloads, an improved Earth systems model, and high-performance computers (HPC).

Research Institutions under the Ministry: The Ministry of Earth Sciences has several research institutions under its mandate, focusing on different aspects ranging from weather forecasting to coastal research. The table below provides a list of such organisations along with their respective person in charge.

S.No.	Name of the Institution	Point of Contact
1	National Centre for Medium Range Weather Forecasting (NCMRWF)	Director - vsprasad@ncmrwf.gov.in
2	National Centre for Seismology (NCS)	Director- director-ncs@gov.in
3	Centre for Marine Living Resources and Ecology (CMLRE)	Director - director@cmlre.gov.in
4	National Centre for Coastal Research (NCCR)	Director - director@nccr.gov.in
5	National Centre for Polar and Ocean Research (NCPOR)	Director - director@ncpor.res.in
6	Indian National Centre for Ocean Information Services (INCOIS)	Director - director@incois.gov.in
7	Indian Institute of Tropical Meteorology (IITM)	Director - surya@tropmet.res.in
8	National Institute of Ocean Technology (NIOT)	Director - director.niot@gov.in
9	National Centre for Earth Science Studies (NCESS)	Director - director@ncess.gov.in

Table 12: List of Research Institutions under MOES with their PoC
(Source: Our Organisation (Accessed on March 01, 2026) | Ministry of Earth Sciences | India.)a.)

Under the Ministry, the India Meteorological Department is a service organisation that provides meteorological, climatological, and forecasting services to the public.

VIII. Ministry of Electronics and Information Technology (MEITY)

Point of Contact
Secretary,
Ministry of Electronics and Information Technology
secretary@meity.gov.in

The Ministry of Electronics and Information Technology (MEITY) is the ministry responsible for shaping and implementing India's electronics and IT policies. It focuses on promoting digital governance, innovation in emerging technologies and strengthening cybersecurity to support India's digital transformation.

Budget Allocation: ₹ 20,233 crore [FY 2025-2026]

Major Initiatives:

1. India AI Mission: IndiaAI mission, launched in March 2024, with a financial outlay of ₹ 10,372 crores, is the flagship mission for the development of AI ecosystem in India. The mission comprises pivotal initiatives such as IndiaAI Compute Capacity, IndiaAI Innovation Centre (IAIC), IndiaAI Datasets Platform, IndiaAI Application Development Initiative, IndiaAI FutureSkills, IndiaAI Startup Financing, and Safe & Trusted AI. Recently, India also released the India AI Governance Guidelines to ensure AI systems in India are safe, trustworthy, human-centric, and inclusive. For more details, please refer to Chapter 4.

2. India Semiconductor Mission: Launched in 2021, the India Semiconductor Mission aims at establishing a strong semiconductor and display ecosystem in India. It was launched with a financial outlay of ₹ 76,000 crores. Currently, in its second phase, ISM 2.0, the mission has four components: semiconductor fabs, display fabs, designed linked incentives, and compound semiconductor & ATMP (assembly, testing, marking, and packaging). Additionally, through ISM, the SEMICON India Programme is also conducted, bringing together relevant stakeholders for investment and partnerships. For more details, please refer to Chapter 4.

3. Digital India Initiative: Digital India is a flagship initiative of MEITY, aimed at transforming the digital landscape of the country, ranging from mobile phones to digital payments. Through Digital India, the country has achieved growth across sectors such as electronics manufacturing, telecom infrastructure, internet connectivity, and digital payments.

Research-oriented institutions under the Ministry: The Ministry of Electronics and Information Technology has several key R&D-oriented institutions under its affiliation, focusing on various aspects of IT and Electronics. The table below lists these institutions along with their respective PoCs.

S.No.	Name of the Institution	Point of Contact
1	Centre for Development of Advanced Computing (C-DAC)	Director General - dg@cdac.in
2	Centre for Materials for Electronics Technology (C-MET)	Director General - dg-cmet@cmet.gov.in
3	Semi-Conductor Laboratory (SCL)	Director - director@scl.gov.in
4	Society for Applied Microwave Electronics Engineering & Research (SAMEER)	Director General - dg@sameer.gov.in
5	Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)	Director General - dg.bisag-n@digitalindia.gov.in

Table 13: List of R&D organisations under MEITY with PoC
(Source: Our Organisation (Accessed on February 27, 2026) | Ministry of Electronics and Information Technology | India.)

The research institutions listed above have research centres and labs of their own across India. A list of research centres and labs for these organisations is provided below, under their respective organisation headers, for reference.

Research Centres of C-DAC: C-DAC has research centres across multiple locations in India. The table below lists all C-DAC centres, along with their PoC.

S.No.	Name of the Institution	Point of Contact
1	C-DAC Bangalore	Executive Director - sds@cdac.in
2	C-DAC Chennai	Centre Head - ethirajand@cdac.in
3	C-DAC Delhi	Centre Head - jitendrasingh@cdac.in
4	C-DAC Guwahati	Centre Head - jitesh@cdac.in
5	C-DAC Hyderabad	Centre Head - prleswari@cdac.in
6	C-DAC Kolkata	Centre Head - chasmurty@cdac.in
7	C-DAC Mohali	Centre Head - vksharma@cdac.in
8	C-DAC Mumbai	Executive Director - saditya@cdac.in
9	C-DAC Noida	Executive Director - ed-noida@cdac.in
10	C-DAC Patna	Centre Head - abhinav@cdac.in
11	C-DAC Pune	Centre Head - sanjayw@cdac.in
12	C-DAC Thiruvananthapuram	Centre Head - kselvan@cdac.in

Table 14: List of Centres under C-DAC with their PoC
(Source: C-DAC Centres (Accessed on March 12, 2026) | Centre for Development of Advanced Computing | India.)

Research Centres of C-MET: C-MET conducts R&D activities through laboratories across multiple locations in India. The table below lists all C-MET centres and their PoC.

S.No.	Name of the Centre	Point of Contact
1.	Pune Laboratory (HQ)	Centre Head- milind@cmet.gov.in
2.	Hyderabad Laboratory	Centre Head- rajesh@cmet.gov.in
3.	Thrissur Laboratory	Centre Head - ypurushotham@cmet.gov.in

Table 15: List of Centres under C-MET with their PoC
(Source: C-MET Centres (Accessed on March 12, 2026) | CMET Centres)

Research Centres of SAMEER: SAMEER has research centres across 05 locations in India, with its headquarters located in Mumbai, India. The table below lists all centres and the PoC for each location.

S.No.	Name of the Centre and Location	Point of Contact
1	Centre for Microwave Research, Mumbai	emcdivision@sameer.gov.in
2	Centre for Electromagnetics, Chennai	ccc.chennai@sameer.gov.in
3	Centre for Microwave & Millimetre Wave, Kolkata	emicatr.kolkata@sameer.gov.in
4	Centre for Electromagnetic Environmental Effects (E3), Visakhapatnam	ccc.vizag@sameer.gov.in
5	Centre for High Power Microwave Tube and Component Technology (CHMTCT), IIT Guwahati, Assam	registrar@sameer.gov.in

Table 16: List of SAMEER research centres with PoC
(Source: Official Website (Accessed on March 12, 2026) | SAMEER | India.)

Affiliated institutions under the ministry: In addition to the research-oriented institutions listed above and their respective centres, the ministry has other affiliated autonomous organisations working across various aspects of electronics and information technology. The table below lists all such institutions along with their PoC.

S.No.	Name of the Organisation	Point of Contact
1	National Informatics Centre (NIC)	Director General - dg@nic.in
2	Digital India Corporation	Chief Executive Officer - ceo@digitalindia.gov.in
3	Indian Computer Emergency Response Team (CERT-In)	Director General - sanjay.bahl@nic.in
4	Unique Identification Authority of India (UIDAI)	Chief Executive Officer- ceo@uidai.gov.in
5	National Internet Exchange of India (NIXI)	Chief Executive Officer- ceo@nixi.in
6	Education & Research in Computer Networking (ERNET)	Director General - dg@ernet.in
7	National Institute for Smart Government	Chief Executive Officer - ceo@nisg.org
8	National e-Governance Division	Chief Executive Officer - ceo-negd@digitalindia.gov.in

Table 17: List of Affiliated Institutions under MEITY with PoC
(Source: Our Organisation (Accessed on February 27, 2026) | Ministry of Electronics and Information Technology | India.)

IX. Department of Higher Education (DHE)

Point of Contact
Secretary,
Department of Higher Education
secy.dhe@nic.in

The Department of Higher Education (DHE) is the nodal authority in India for the overall development of higher education. The department focuses on establishing infrastructure, designing policies and engaging in sector-level planning to provide access to quality education. For research and innovation, the department initiates programmes and policies in public and private educational institutions to expand the knowledge base and generate a culture of innovation.

Budget: ₹ 51,382 crore [FY 2025-2026]*

Major Initiatives:

1. National Education Policy, 2020:The National Education Policy 2020 is a comprehensive framework designed to transform India's education system. It replaces the 10+2 school structure with a new 5+3+3+4 model and introduces multiple entry and exit options in higher education to reduce dropout rates. The policy aims to move towards critical thinking, integrating vocational education and digital literacy at all levels of schooling.

IX.A University Grants Commission (UGC)

Point of Contact
Secretary,
University Grants Commission
secy.ugc@nic.in

The University Grants Commission (UGC) is a statutory body established in 1956. It is the apex regulator for higher education institutions across India. Its core functions include coordinating and maintaining academic standards for teaching, examinations and research as well as recognising universities. Additionally, the UGC serves as a vital financial link by allocating and disbursing grants to eligible universities and colleges. National Assessment and Accreditation Council (NAAC), an autonomous body under the UGC, focuses on the quality assurance of Higher Education Institutions in India.

IX.B All India Council for Technical Education (AICTE)

Point of Contact
Chairman,
All India Council for Technical Education
chairman@aicte-india.org

The All-India Council for Technical Education (AICTE) is the statutory body responsible for the coordinated development and structured planning of technical education across India. It oversees specialised programs across various technical education domains. The core function of AICTE is to act as both a regulator and a

*The DHE budget also includes the budgetary provisions for UGC and AICTE

facilitator by granting approvals to establish new technical institutions or introduce new courses in existing ones. It formulates essential norms and standards regarding infrastructure, faculty qualifications, and curriculum to maintain uniformity across the country.

X. Department of Telecommunication (DoT)

Point of Contact
Chairman,
Digital Communication Commission, and Secretary, Telecommunication
secy-dot@nic.in

The Department of Telecommunications (DoT) is responsible for providing secure, reliable, and affordable telecom services that drive inclusive socioeconomic development. Its purpose is to expand and modernise India's telecom infrastructure and bridge the digital divide, with a special focus on rural areas. It empowers citizens through high-quality broadband and mobile services, and promotes indigenous innovation under "Design in India."

Budget: ₹ 53,398 crore [FY 2025-2026]

Major Initiatives:

1. Bharat 6G Alliance: The Alliance was launched in July 2023 to advance the development of 6G technologies within the country. It is an industry-led body, facilitated by the government, that provides a platform to various technology stakeholders to create affordable 5G and 6G solutions. As of now, under the alliance, there are a total of 85 institutions.

2. National Broadband Mission: The National Broadband Mission (NBM) is a flagship DoT initiative focused on improving telecom infrastructure and bridging the digital divide through high-speed broadband connectivity. NBM 1.0 aimed to fix major bottlenecks in the telecom infrastructure by collaborating with states and local bodies. Following up on the same, NBM 2.0 (launched in 2025) functions on three key pillars: Universality, Affordability and Quality.

3. Telecom Technology Development Fund: The Telecom Technology Development Fund (TTDF) was launched in October 2022 to fund research and development (R&D) in rural-specific communication technologies. As of December 2025, 136 projects amounting to ₹ 542.22 crore have been approved under the Scheme.

*The DoT budget also includes the budgetary provisions for TRAI.

Research Institutions under the department: The DoT has several research-oriented institutions working on various aspects of telecommunications. These research institutions are listed below for reference.

S.No.	Name of the Institution	Point of Contact
1	National Centre for Communication Security	Senior Deputy Director General and Head - srddg.nccs-dot@gov.in
2	Centre for Development of Telematics	Chief Executive Officer - ceo@cdot.in
3	National Communications Academy	Director General - dot@gov.in
4	Telecom Engineering Centre	Senior Deputy Director General and Head - srddg.tec@gov.in
5	Wireless Monitoring Organisation	Director (Admin) - diradmin.wmo-dot@gov.in

Table 18: List of Research Institutions under DoT with their PoC
(Source: Our Organisation (Accessed on February 27, 2026) | Department of Telecommunications | India.)

Research Centres of C-DOT: C-DOT has research centres across multiple locations in India. C-DOT has campuses in Delhi and Bengaluru.

Point of Contact: C-DOT: ceo@cdot.in (Chief Executive Officer)

Public Sector Undertaking under the department: The Department of Telecommunications has 05 public sector enterprises under its mandate. The list of these PSUs is provided below for reference, along with their respective point-of-contact details.

S.No.	Name of the Institution	Point of Contact
1	Bharat Sanchar Nigam Limited (BSNL)	Chief Managing Director - cmdbsnl@bsnl.co.in
2	Mahanagar Telephone Nigam Limited (MTNL)	Chief Managing Director - cmd@bol.net.in
3	Bharat Broadband Network Limited (BBNL)	Chief Managing Director - cmd.bbnl@bbnlindia.in
4	Telecommunications Consultants India Limited (TCIL)	Chairman and Managing Director - srddg.tec@gov.in
5	Indian Telephone Industries Limited (ITI)	Chief Managing Director - cmd@itiltd.co.in

Table 19: List of PSUs under DoT with their PoC
(Source: Our Organisation (Accessed on March 20, 2026) | Department of Telecommunications | India.)

X.A Telecom Regulatory Authority of India

Point of Contact
Chairman,
Telecom Regulatory Authority of India
cp@trai.gov.in

The Telecom Regulatory Authority of India (TRAI) is a statutory body established in 1997 to keep the telecom sector fair and open to all while ensuring consumer protection. It does so by advising the government, setting service quality standards, and monitoring prices in telecom and broadcasting. For dispute resolution and settlement, the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) was established later to adjudicate disputes and handle appeals relating to the telecom sector.

XI. Scientific Councils

Various sectoral scientific councils also function in India to engage in R&D activities and promote innovation in the S&T ecosystem.

The key institutions within this category are outlined below:

I. Indian Council of Medical Research (ICMR)

Point of Contact
Director General,
Indian Council of Medical Research
secy-dg@icmr.gov.in

The Indian Council of Medical Research is the apex body for conducting, coordinating, and implementing medical research for the benefit of society. The organisation plays a pivotal role in India's science and technology landscape by driving breakthroughs in the field of healthcare and medical sciences.

- The National Health Research Programme established under ICMR is one such initiative that focuses on critical research across 11 identified disease categories.
- ICMR, to accelerate medical innovation, has also established a Medical Innovation Fund, through which it aims to support novel and highly creative ideas, even if they have a high probability of failure. This promotes a mindset and environment of innovation and curiosity.

Research Institutions under ICMR:

The table provided below enlists all the labs and research institutes under ICMR.

Table 20 (following page): List of Research Labs and Institutes under ICMR
(Source: Institutes (Accessed on March 05, 2026) | Indian Council of Medical Research | India.)

S.No.	Name of the Institute	Point of Contact
1	ICMR National JALMA Institute for Leprosy & Other Mycobacterial Diseases	Director - director-jalma@icmr.gov.in
2	ICMR National Institute of Occupational Health	Director - director-nioh@gov.in
3	ICMR National Institute of Traditional Medicine	Director - director.nitm@icmr.gov.in
4	ICMR National Institute of NCD Epidemiology	Director - nine@icmrnine.org
5	ICMR National Institute for Research in Environmental Health	Director - director.nireh@icmr.gov.in
6	ICMR Bhopal Memorial Hospital & Research Centre (BMHRC)	Director - directoroffice-bmhrc@icmr.gov.in
7	ICMR Regional Medical Research Centre Bhubaneswar	Director - dir.rmrcb@icmr.gov.in
8	ICMR National Institute for Research in Tuberculosis	Director - directornirt@nirt.res.in
9	ICMR National Institute of Epidemiology	Director - director.nie@icmr.gov.in
10	ICMR National Institute for Research in Digital Health and Data Science	Director - directorniih@gmail.com
11	ICMR National Institute of Malaria Research	Director - nirdh.director@icmr.gov.in
12	ICMR National Institute of Child Health and Development Research	Director - director-nichr@icmr.gov.in
13	ICMR Regional Medical Research Centre, NE Region	Director - director-rmrcne@icmr.gov.in
14	ICMR Regional Medical Research Centre Gorakhpur	Director - rmrcgkp@icmr.gov.in
15	ICMR National Institute of Nutrition	Director - director.nin@icmr.gov.in
16	ICMR National Institute for Pre-Clinical Research (NIPCR)	Director - director-narfbr@icmr.gov.in
17	ICMR National Institute of Research in Tribal Health	Director - director-nirth@icmr.gov.in
18	ICMR National Institute for Implementation Research on Non-Communicable Diseases	Director - director-niirncd@icmr.gov.in
19	ICMR National Institute for Research in Bacterial Infections	Director - director-niced@icmr.gov.in
20	National Institute of One Health	Director-in-charge yadav.pragya@gov.in
21	ICMR - National Institute for Research on Women's Health (ICMR-NIRWoH)	Director - dir.nirrh@icmr.gov.in
22	ICMR National Institute of Cancer Prevention and Research	Director - director.nicpr@icmr.gov.in
23	ICMR Rajendra Memorial Research Institute of Medical Sciences	Director - director-rmri@icmr.gov.in
24	ICMR Vector Control Research Centre	Director - director.vcrc@icmr.gov.in
25	ICMR National Institute of Virology	Director - director.niv@icmr.gov.in

II. Indian Council of Agricultural Research (ICAR)

Point of Contact
Director General,
Indian Council of
Agricultural Research
dg.icar@nic.in

ICAR is the apex research body for agriculture, horticulture, fisheries, and animal sciences in the country. Through its research and innovation, the council has played a pivotal role in driving the green revolution by increasing the production of food grains, horticultural crops, fish, and dairy products.

National Innovations in Climate Resilient Agriculture (NICRA) is an ICAR initiative focused on strengthening the resilience of Indian agriculture to climate change and related vulnerabilities.

Research Institutions under ICAR:

The table provided below enlists all the research institutes under ICAR.

S.No.	Research Institutes	Point of Contact
1	ICAR - Central Agroforestry Research Institute (CAFRI)	Director - director.cafri@icar.org.in
2	ICAR - Central Arid Zone Research Institute (CAZRI)	Director - director.cazri@icar.org.in
3	ICAR - Central Avian Research Institute(CARI)	Director - directorcari24@gmail.com
4	ICAR - Central Citrus Research Institute (CCRI)	Director - director.ccri@icar.org.in
5	ICAR - Central Coastal Agricultural Research Institute(CCARI)	Director- director.ccari@gmail.com
6	ICAR - Central Institute for Arid Horticulture(CIAH)	Director - director.ciah@icar.org.in
7	ICAR - Central Institute for Research on Buffaloes(CIRB)	Director - director.cirb@icar.org.in
8	ICAR - Central Institute for Research on Cattle (CIRC)	Director - director.circ@icar.org.in
9	ICAR - Central Institute for Research on Goats (CIRG)	Director - director.cirg@icar.org.in
10	ICAR - Central Institute of Agricultural Engineering (CIAE)	Director - director.ciae@icar.org.in
11	ICAR - Central Institute of Coldwater Fisheries Research (CICFRI)	Director - director.cicfrin@gmail.com
12	ICAR - Central Institute of Cotton Research (CICR)	Director - director.cicr@icar.org.in
13	ICAR - Central Institute of Fisheries Technology (CIFT)	Director - aris.cift@gmail.com
14	ICAR - Central Institute of Freshwater Aquaculture (CIFA)	Director -director.cifa@icar.org.in
15	ICAR - Central Institute of Research on Cotton Technology (CIRCT)	Director- director-circot@icar.org.in
16	ICAR - Central Institute of Subtropical Horticulture (CISTH)	Director- cish.lucknow@gmail.com
17	ICAR - Central Institute of Temperate Horticulture (CITH)	Director- dircithsgr@icar.org.in
18	ICAR - Central Institute on Post-Harvest Engineering & Technology (CIPHET)	Director- director.ciphet@icar.org.in
19	ICAR - Central Island Agricultural Research Institute (CIARI)	Director - director.ciari@icar.org.in
20	ICAR - Central Institute for Women in Agriculture (CIWA)	Director- director.ciwa@icar.gov.in

S.No.	Research Institutes	Point of Contact
21	ICAR - Central Inland Fisheries Research Institute (CIFRI)	Director - director.cifri@gmail.com
22	ICAR - Central Institute of Brackishwater Aquaculture (CIBA)	Director -director.ciba@icar.org.in
23	ICAR - Central Marine Fisheries Research Institute (CMFRI)	Director- director.cmfri@icar.gov.in
24	ICAR - Central Plantation Crops Research Institute (CPCRI)	Director- director.cpcri@icar.org.in
25	ICAR - Central Potato Research Institute (CPRI)	Director - director.cpri@icar.org.in
26	ICAR - Central Research Institute for Jute & Allied Fibres (CRIJAF)	Director - director-crijaf@icar.org.in
27	ICAR - Central Research Institute for Dryland Agriculture (CRIDA)	Director- director.crida@icar.org.in
28	ICAR - Central Sheep & Wool Research Institute (CSWRI)	Director- director.cswri@icar.org.in
29	ICAR - Central Soil Salinity Research Institute (CSSRI)	Director- director.cssri@icar.gov.in
30	ICAR - Central Tuber Crops Research Institute (CTCRI)	Director- director.ctcri@icar.org.in
31	ICAR - Research Complex for Eastern Region (ICAR-RCER)	Director- director.icar-rcer@icar.gov.in
32	ICAR - Research Complex for NEH Region (ICAR-RCNEH)	Director- director.icar-neh@icar.org.in
33	ICAR - Indian Institute of Farming Systems Research (IIFSR)	Director - director.iifsr@icar.org.in
34	ICAR - Indian Institute of Millets Research (IIMR)	Director- director.millets@icar.gov.in
35	ICAR - Indian Institute of Oil Palm Research (IIOPR)	Director- director.iiopr@icar.org.in
36	ICAR - Indian Institute of Oilseeds Research (IIOR)	Director - director.iior@icar.org.in
37	ICAR - Indian Institute of Soil and Water Conservation (IISWC)	Director- director.iiswc@icar.gov.in
38	ICAR - Indian Institute of Water Management (IIWM)	Director- director.iiwm@icar.org.in
39	ICAR - Indian Institute of Wheat & Barley Research (IIWBR)	Director- director.iiwbr@icar.org.in
40	ICAR - Indian Agricultural Research Institute (IARI)	Director - director@iari.res.in
41	ICAR - Indian Agricultural Statistics Research Institute (IASRI)	Director - director.iasri@icar.org.in
42	ICAR - Indian Grassland & Fodder Research Institute (IGFRI)	Director - igfri.director@gmail.com
43	ICAR - Indian Institute of Agricultural Biotechnology (IIAB)	Director - s.rakshit@icar.org.in
44	ICAR - Indian Institute of Groundnut Research (IIGR)	Director - director.groundnut@gmail.com
45	ICAR - Indian Institute of Horticultural Research (IIHR)	Director - director.iihr@icar.org.in
46	ICAR - Indian Institute of Maize Research (IIMR	Director- director.maize@icar.gov.in
47	ICAR - Indian Institute of Pulses Research (IIPR)	Director - director.iipr@icar.org.in
48	ICAR - Indian Institute of Rapeseed Mustard Research (IIRMR)	Director- director.drmr@gmail.com
49	ICAR - Indian Institute of Rice Research (IIRR)	Director - iirricar@gmail.com
50	ICAR - Indian Institute of Soil Science (IISS)	Director - director.iiss@icar.org.in
51	ICAR - Indian Institute of Spices Research (IISR)	Director- directorspices@gmail.com
52	ICAR - Indian Institute of Sugarcane Research (IISR)	Director - directorisri@gmail.com
53	ICAR - Indian Institute of Vegetable Research (IIVR)	Director - director.iivr@icar.org.in
54	ICAR - National Academy of Agricultural Research Management	Director - director@naarm.org.in
55	ICAR - National Institute for Abiotic Stress Management (NIASM)	Director - k.sammireddy@icar.org.in

S.No.	Research Institutes	Point of Contact
56	ICAR - National Institute for Research on Commercial Agriculture (NIRCA)	Director- directornirca@gmail.com
57	ICAR - National Institute of Agricultural Economics & Policy Research (NIAEPR)	Director- director-niap@icar.org.in
58	ICAR - National Institute of Animal Nutrition & Physiology (NIANP)	Director- director.nianp@icar.gov.in
59	ICAR - National Institute of Biotic Stresses Management (NIBSM)	Director- director.nibsm@gmail.com
60	ICAR - National Institute of High Security Animal Diseases (NIHSAD)	Director- director.nihsad@icar.org.in
61	ICAR - National Institute of Natural Fibre Engineering & Technology (NINFET)	Director- director.ninfet@icar.gov.in
62	ICAR - National Institute of Plant Biotechnology (NIPB)	Director- director-nipb@icar.org.in
63	ICAR - National Institute of Secondary Agriculture (NISA)	Director - director.nisa@icar.org.in
64	ICAR - National Institute of Seed Science & Technology (NISST)	Director - pddsrmau@gmail.com
65	ICAR - National Institute of Veterinary Epidemiology & Disease Informatics (NIVEDI)	Director- director.nivedi@icar.org.in
66	ICAR - National Institute on Foot and Mouth Disease (NIFMD)	Director- director.dfmd@icar.gov.in
67	ICAR - National Meat Research Institute (NMRI)	Director- director.nmri@icar.org.in
68	ICAR - National Research Institute for Integrated Pest Management	Director- director.nriipm@icar.org.in
69	ICAR - National Rice Research Institute (NRRI)	Director - director.nrri@icar.gov.in
70	ICAR - National Soybean Research Institute (NSRI)	Director - dsrdirector@gmail.com
71	ICAR-Mahatma Gandhi Integrated Farming Research Institute (MGIFRI)	Director - director-mgifri@icar.org.in
72	ICAR - Sugarcane Breeding Institute (SBI)	Director - director.sbi@icar.org.in
73	ICAR - Vivekananda Parvatiya Krishi Anusandhan Sansthan (VPKAS)	Director - directorvpkasalmora@gmail.com
74	ICAR-National Research Centre for Banana (NRCB)	Director- director.nrcb@icar.org.in
75	ICAR-National Research Centre for Grapes (NRCG)	Director- director.nrcg@icar.org.in
76	ICAR-National Research Centre for Litchi (NRCL)	Director- director@nrclitchi.org.in
77	ICAR-National Research Centre for Pomegranate (NRCP)	Director- nrcpomegranate@gmail.com
78	ICAR-National Research Centre on Camel (NRCC)	Director - anil.puniya@icar.org.in
79	ICAR-National Research Centre on Equines (NRCE)	Director - nrcequine@nic.in
80	ICAR-National Research Centre on Mithun (NRCM)	Director- Director.NRCMithun@icar.org.in
81	ICAR-National Research Centre on Orchids (NRCO)	Director - director.nrco@icar.org.in
82	ICAR-National Research Centre on Pig (NRCP)	Director - director.nrcp@icar.org.in
83	ICAR-National Research Centre on Seed Spices (NRCSS)	Director - nrcss.director@gmail.com
84	ICAR-National Research Centre on Yak (NRCY)	Director- director-nrcy@icar.org.in
85	ICAR–National Research Centre for Makhana (NRCM)	Director- director.ciphet@icar.org.in
86	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone I	Director- zcu1ldh@gmail.com

S.No.	Research Institutes	Point of Contact
87	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone II	Director- atarijodhpur@gmail.com
88	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone III	Director- zpclicarkanpur@gmail.com
89	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone IV	Director- ataripatna@gmail.com
90	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone V	Director- atarikolkata@gmail.com
91	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone VI	Director- govindasamy.kadirvel@icar.org.in
92	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone VII	Director- director.atariumiam@gmail.com
93	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone VIII	Director- subrata.roy1@icar.org.in
94	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone IX	Director- zcunit@rediffmail.com
95	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone X	Director- director.atari-hyd@icar.org.in
96	ICAR–Agricultural Technology Application Research Institute (ATARI), Zone XI	
97	ICAR–Directorate of Poultry Research (DPR)	Director- director.dpr@icar.org.in
98	ICAR–Indian Veterinary Research Institute (IVRI)	Director- directorivri@gmail.com
99	ICAR–National Bureau of Animal Genetic Resources (NBAGR)	Director- director-nbagr@icar.org.in
100	ICAR–National Dairy Research Institute (NDRI)	Director- director.ndri@icar.org.in
101	ICAR–Indian Agricultural Research Institute (IARI)	Director- director.iariassam@icar.org.in
102	ICAR–Indian Agricultural Research Institute (IARI)	Director- director@iari.res.in
103	ICAR–National Bureau of Agriculturally Important Microorganisms	Director- nbaimicar@gmail.com
104	ICAR–National Bureau of Agricultural Insect Resources (NBAIR)	Director- nbairdirector@gmail.com
105	ICAR–National Bureau of Plant Genetic Resources (NBPGR)	Director- director.nbpgr@nic.in
106	ICAR–Central Institute of Fisheries Education (CIFE)	Director- director@cife.edu.in
107	ICAR–National Bureau of Fish Genetic Resources (NBFGR)	Director- director.nbfgr@icar.org.in
108	ICAR–Directorate of Cashew Research (DCR)	Director- jd.adiga@icar.org.in
109	ICAR–Directorate of Floricultural Research (DFR)	Director- director.dfr@icar.org.in
110	ICAR–Directorate of Medicinal and Aromatic Plants Research	Director- director.dmapr@gmail.com
111	ICAR–Directorate of Mushroom Research (DMR)	Director- directordmr@gmail.com
112	ICAR–Directorate of Onion and Garlic Research (DOGR)	Director- director.dogr@icar.org.in
113	ICAR–Directorate of Weed Research (DWR)	Director- director.dwr@icar.org.in
114	ICAR–National Bureau of Soil Survey and Land Use Planning	Director- director-nbsslup@icar.org.in

Table 21: List of research Institutes under ICAR with their PoC
(Source: Institutes (Accessed on March 05, 2026) | Indian Council of Agricultural Research | India.)

III. Indian Council of Social Science Research (ICSSR)

Point of Contact
Chairman,
Indian Council of Social Science Research
chairman@icssr.org

The Indian Council of Social Science Research is the apex body for social and human science research. The organisation plays a significant role in providing research-based solutions to policymakers on various social issues.

Research Institutions under ICSSR: The table provided below enlists all the research institutes under ICSSR and their PoC.

S.No.	Name of the Institution	Point of Contact
1.	Institute for Social and Economic Change (ISEC)	Director - director@isec.ac.in
2.	Centre for Development Studies (CDS)	Director - director@cds.ac.in
3.	Centre for Studies in Social Sciences (CSSS)	Director - director@cssscal.org
4.	A.N. Sinha Institute of Social Studies (ANSISS)	Director - directoransiss@gmail.com
5.	Institute of Public Enterprise (IPE)	Director - director@ipeindia.org
6.	Institute of Economic Growth (IEG)	Director - diroffice@iegindia.org
7.	Centre for the Study of Developing Societies (CSDS)	Director - director@csds.in
8.	Centre for Social Studies (CSS)	Office - info@css.ac.in
9.	Madras Institute of Development Studies (MIDS)	Director - director@mids.ac.in
10.	Indian Institute of Education (IIE)	Office - iiepune1948@gmail.com
11.	Giri Institute of Development Studies (GIDS)	Director - directorgids@gmail.com
12.	Centre for Policy Research (CPR)	President and Chief Executive - president.cpr@cprindia.org
13.	Sardar Patel Institute of Economic and Social Research (SPIESR)	Director - director@spiesr.ac.in
14.	Council for Social Development (CSD)	Director - director@csdhyd.org
15.	Institute of Development Studies (IDS)	Director - director@idsj.org
16.	Centre for Research in Rural and Industrial Development (CRRID)	Director - director@crrid.res.in
17.	Centre for Women's Development Studies (CWDS)	Director - director@cwds.ac.in
18.	Centre for Economic and Social Studies(CESS)	Director - director@cess.ac.in
19.	NKC Centre for Development Studies (NKCCDS)	Director - director.ncds@gov.in
20.	Gujarat Institute of Development Research (GIDR)	In-charge - director@gidr.ac.in
21.	Institute for Studies in Industrial Development (ISID)	Director - director@isid.org.in
22.	O.K.D. Institute of Social Change and Development (OKDISCD)	Director - director.okd@gmail.com
23.	Centre for Multi-Disciplinary Development Research (CMDR)	Director- directorcmdr@yahoo.com
24.	Madhya Pradesh Institute of Social Science Research (MPISSR)	Office - mpissr@yahoo.co.in

Table 22: List of research Institutes under ICSSR with their PoC
(Source: Research Institutes (Accessed on March 20, 2026) | ICSSR | India.)

IV. Indian Council of Forestry Research and Education (ICFRE)

Point of Contact
Director General,
Indian Council of Forestry Research and Education (ICFRE) - dg@icfre.org

ICFRE is an apex body in the national forestry research system that promotes the scientific and sustainable management of forest resources in the country. It coordinates research and provides policy support on climate change mitigation, biodiversity and forest conservation through a network of 9 regional research institutes and 5 centres, present across different geographical regions of the country.

Research Centres of ICFRE:

ICFRE has research centres and institutes across multiple locations in India. The table below lists all ICFRE centres, along with their PoC.

S.No.	Research Institutes	Point of Contact
1.	ICFRE - Forest Research Institute (FRI)	Director - dir_fri@icfre.org
2.	ICFRE - Tropical Forest Research Institute (TFRI)	Director - dir_tfri@icfre.org
3.	ICFRE - Arid Forest Research Institute (AFRI)	Director - dir_afri@icfre.org
4.	ICFRE - Himalayan Forest Research Institute (HFRI)	Director - dir_hfri@icfre.org
5.	ICFRE - Institute of Forest Productivity (IFP)	Director - dir_ifp@icfre.org
6.	ICFRE - Institute of Forest Biodiversity (IFB)	Director - director_ifb@icfre.org
7.	ICFRE - Institute of Forest Genetics and Tree Breeding(IFGTB)	Director - dir_ifgtb@icfre.org
8.	ICFRE - Rain Forest Research Institute(RFRI)	Director - dir_rfri@icfre.org
9.	ICFRE - Institute of Wood Science and Technology (IWST)	Director - dir_iwst@icfre.org
10.	ICFRE - Skill Development Centre (SDC)	Head - incharge_frcsd@icfre.org
11.	ICFRE - Bamboo & Rattan Centre	Head - dir_arcbr@icfre.org
12.	ICFRE - Eco-Rehabilitation Centre (ERC)	Head - dir_csfer@icfre.org
13.	ICFRE - Livelihood Extension Centre (LEC)	Head - head_frcle@icfre.org
14.	ICFRE - Coastal Ecosystem Centre (CEC)	Scientist In-charge - Head_FRCCE_Vizag@icfre.org

Table 23: List of research Institutes under ICFRE with their PoC
(Source: Institutes (Accessed on March 20, 2026) | ICFRE | India.)

2.3 Sectoral Ministries Contributing to S&T Ecosystem

Apart from ministries/departments with a core focus on science and technology, several other ministries/departments also have a focus component on S&T.

The key institutions within this category are outlined below:

I. Department for Promotion of Industry and Internal Trade (DPIIT)

Point of Contact
Secretary,
Department for Promotion of Industry and Internal Trade
secy-ipp@nic.in

The Department for Promotion of Industry and Internal Trade (DPIIT) is the nodal department for formulating and implementing policies and measures related to industrial growth. The department is also responsible for facilitating investments and accelerating FDI flows.

- Invest India,under DPIIT, attracts and facilitates investment into India and connects innovators and startups with industry, investors and market-access opportunities to support the commercialisation of their innovations.
- Open Network for Digital Commerce (ONDC) is a DPIIT initiative focused on promoting open networks for the digital exchange of goods and services. The initiative focuses on democratising e-commerce, lowering barriers to entry, and creating an interoperable digital public infrastructure for innovation.
- PM Gati Shakti (Logistics Division) is an infrastructural development initiative focused on ensuring multimodal, first and last-mile connectivity for the movement of people and goods.

II. Department of Pharmaceuticals

Point of Contact:
Secretary, Department of Pharmaceuticals
secretary@pharma-dept.gov.in

The Department of Pharmaceuticals focuses primarily on the development within the pharmaceutical sector in India. The department regulates issues related to the pricing, availability, and affordability of medicines. It also engages in research and development and international collaborations to advance the manufacturing capacity of the sector.

- Biopharma SHAKTI: The Biopharma Strategy for Healthcare Advancement through Knowledge, Technology & Innovation (SHAKTI) scheme is an effort to strengthen India's standing in the global biopharmaceutical ecosystem. It was announced in February 2026 as part of the Union Budget FY 2026-2027, with a financial outlay of ₹ 10,000 crore over five years. The initiative aims to scale India's domestic manufacturing of high-value biologics and biosimilars and to reduce the import dependency for the same. For more details, refer to Chapter 4.

III. Ministry of AYUSH

Point of Contact
Secretary,
Ministry of AYUSH
secy-ayush@nic.in

The Ministry of Ayush (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) is the nodal ministry for promoting knowledge of ancient medicine systems. The ministry also strengthens scientific standardisation and innovation through bodies such as the Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H), which develops pharmacopoeial standards and drug-testing systems.

- The AYURGYAN Scheme by the ministry focuses on promoting research and education in the fields of Ayush. Under its mandate, the mission also has an Ayurveda Biology Integrated Health Research programme that integrates traditional Ayurvedic principles with modern sciences such as immunology and pharmacology.

IV. Ministry of Civil Aviation (MoCA)

Point of Contact
Secretary,
Ministry of Civil Aviation
secy.moca@nic.in

The Ministry of Civil Aviation is the central authority for devising and implementing national policies and programmes for the civil aviation sector.

- The Drone Shakti Mission is the flagship mission for drone manufacturing and innovation, aimed at creating a technologically advanced drone technology ecosystem. The mission has two components: one focusing on incentivisation for drone and drone-component manufacturing, and the other on funding for research and innovation. The ministry also launched the Drone Rules in 2021 to ensure a liberalised framework for drone operations and innovation while ensuring safety through the Digital Sky platform. For more details, refer to Chapter 4.

V. Ministry of Environment, Forest and Climate Change

Point of Contact
Secretary,
Ministry of Environment,
Forest and Climate Change
secy-moef@nic.in

MoEFCC is responsible for environmental and forestry policies in India. The ministry focuses on technologies that promote waste minimisation and environmental protection. The National Environmental Policy 2006 also advocates an action plan for clean technologies and innovation to abate pollution and reduce environmental stress.

- MoEFCC's flagship mission for the Himalayan Region, "National Mission on Himalayan Studies", focuses on researching and developing new technologies to sustain and rejuvenate the Himalayan region in India. The mission carries core components of capacity building, waste minimisation, and resource management that require innovative approaches to make the Himalayas plastic-free.

VI. Ministry of External Affairs (MEA)

Point of Contact
Foreign Secretary,
Ministry of External Affairs
psfs@mea.gov.in

The Ministry of External Affairs is the nodal agency responsible for coordinating and executing the country's external and foreign diplomatic affairs. The Ministry engages in international negotiations, coordinates with foreign embassies, and analyses treaties and foreign policies. The ministry plays a pivotal role in facilitating international technology engagements and cooperation.

- Cyber Diplomacy Division: This division focuses on facilitating dialogues & engagements with partner countries on issues related to cyber technology and cybersecurity.
- New, Emerging, and Strategic Technologies Division (NEST): The NEST division focuses on international policy aspects related to emerging technology and India's technology diplomacy positioning and engagements.

VII. Ministry of Heavy Industries

Point of Contact
Secretary,
Ministry of Heavy
Industries shioff@nic.in

The Ministry of Heavy Industry is focused on the growth of the automotive, heavy electrical engineering, and machine tool industries. The ministry, via its autonomous institutions such as the ARAI, iCAT, and CMTI, engages in research and development and manufacturing technologies that strengthen India's industrial science and technology ecosystem.

- For domestic EV manufacturing and R&D, the Ministry initiated the Faster Adoption and Manufacturing of (Hybrid & Electric) Vehicles in India (FAME India) Scheme, which is currently in its second phase. The scheme not only promotes domestic EV production but also the creation of charging infrastructure.

VIII. Ministry of Mines

Point of Contact
Secretary,
Ministry of Mines
secy-mines@nic.in

The Ministry of Mines is responsible for the exploration and mining of all minerals other than coal, petroleum, and natural gas. The Ministry promotes research and innovation in applied geosciences, mineral exploration, mining and mineral processing.

- The National Critical Mineral Mission (NCMM) was launched in 2025 with a budget of ₹ 16,300 crore to secure the critical minerals value chain and promote research and development within the sector. As part of NCMM, dedicated centres of excellence have also been established. For more details, refer to Chapter 4.

IX. Ministry of New and Renewable Energy (MNRE)

Point of Contact
Secretary,
Ministry of New and Renewable Energy
secy-mnre@nic.in

The Ministry of New and Renewable Energy, as per its core mandate, is the nodal Ministry for all new and renewable energy matters within the country. Within the scope of its mandate, the ministry has various schemes aimed at promoting the development of renewable technologies.

- The National Green Hydrogen Mission, anchored by MNRE and launched in 2023 with an initial outlay of ₹ 19,744 crore, not only incentivises green hydrogen manufacturing but also focuses on R&D through green hydrogen hubs and the strategic hydrogen innovation partnership (SHIP). The mission closes the loop by supporting exports and industry collaboration to adopt the given energy fuel. For more details, refer to Chapter 4.

X. Ministry of Power

Point of Contact
Secretary,
Ministry of Power
secy-power@nic.in

The Ministry of Power is responsible for shaping and coordinating India's overall policy in the electricity sector, including long to short-term planning for power generation, transmission, and distribution. It also oversees matters related to hydro and thermal power.

- For specialised research in the power sector, the Ministry, through its autonomous institution, the Central Power Research Institute (CPRI), conducts R&D to develop equipment that supports a reliable, high-quality power supply for power utilities.

- The recently concluded flagship smart grid mission of the Ministry, "National Smart Grid Mission", focused on innovation in India's electricity infrastructure by deploying advanced grid technologies like smart grids, grid automation, and digital distribution systems.

XI. Ministry of Textiles

Point of Contact
Secretary,
Ministry of Textiles
secy-textiles@nic.in

The Ministry of Textiles is the apex body of the country for the development, promotion, and regulation of the textile industry. The ministry focuses on a wide range of activities, ranging from traditional handlooms to modern textiles. Within the technology domain, the ministry, through the technical and research component of its initiatives, contributes to sustainable fashion, manufacturing advancements, and design innovation.

- The National Technical Textiles Mission is the flagship mission of the ministry announced in FY 2020-21 to strengthen India's technical textile base. A budget of ₹ 1,480 crore has been allocated for the mission. It supports developments related to speciality fibres, indigenous machinery, and functional textiles. Under NTTM, 168 projects have been approved, including 79 research projects.

2.4 Innovation Promotion Agencies

The S&T institutional ecosystem in India also has various bodies focusing on promoting innovation through various programs and schemes.

The key institutions within this category are outlined below:

I. Atal Innovation Mission (AIM)

Point of Contact
Mission Director
md-aim@gov.in

AIM is the flagship initiative launched by the Government of India to establish a practice of innovation and entrepreneurship across the country. The mission, through its diverse range of programmes, provides a platform for innovation and collaboration to various stakeholders, creating a sustainable ecosystem of research, innovation and entrepreneurship.

- Atal Tinkering Labs (ATLs) are laboratories established within schools as a part of AIM to inculcate a design mindset, curiosity and imagination amongst young minds. They focus on developing skills such as computational thinking, physical computing, and adaptive learning, etc.
- Atal Incubation Centre (AICs) are incubators established to support innovation and entrepreneurship to contribute to India's growing start-up ecosystem.
- Atal Community Innovation Centre provides nationwide expansion of the mission by serving underserved regions of India, enabling robust infrastructure and fostering an environment for innovation.

II. Startup India

Point of Contact
Additional Secretary, DPIIT
as-aks@gov.in

The Startup India initiative aims at creating a robust startup ecosystem in the country to transform the employment landscape by converting job seekers into job creators. The initiative fulfils this vision through various programs targeting specific aspects of creating a startup ecosystem.

- Fund of Funds: The fund of funds under Startup India was launched in 2016 to address funding gaps within the Indian startup ecosystem. Fund of Funds (FoF) 1.0 had an outlay of ₹ 10,000 crore for nurturing first-time founders and helped build a strong foundation for India's venture capital ecosystem. FoF 2.0 was launched in February 2026 with the same financial outlay of ₹ 10,000 crore.

2.5 State/UT S&T Agencies

Apart from national-level scientific bodies, S&T bodies also function at the state level. The list below illustrates the science and technology councils and agencies across different states/UTs in India.

S.No	Name of the Council/Department	State/UT	Point of Contact
1.	Department of Science and Technology, Andaman and Nicobar	Andaman and Nicobar	Director - dstpcc-andamans@and.nic.in
2.	Andhra Pradesh State Council of Science & Technology	Andhra Pradesh	Office - apcost_vijayawada@yahoo.com
3.	Arunachal Pradesh State Council for Science and Technology	Arunachal Pradesh	Director - cd.mungyak@gov.in
4.	Assam Science Technology & Environment Council	Assam	Director - directorastec@gmail.com
5.	Bihar Council of Science and Technology	Bihar	Secretary (Executive Committee) - directordst@bihar.gov.in
6.	Chhattisgarh Council of Science & Technology	Chhattisgarh	Director - General- dgccost@gmail.com
7.	Council of Science & Technology, Uttar Pradesh	Uttar Pradesh	Office - cstup@nic.in
8.	Department of Science & Technology, Dadra and Nagar Haveli and Daman and Diu	Dadra and Nagar Haveli and Daman and Diu	Office of the Principal Scientific Officer, Science & Technology Department Ph: (0260) 2230685
9.	Department of Science & Technology, Government of NCT of Delhi	Delhi (NCT)	Sr. Scientific Officer - ranjana.sh@delhi.gov.in
10.	JK Science, Technology & Innovations Council Department of Science & Technology	Jammu and Kashmir	Under Secretary (Science & Technology) - atulsingh.2054@jk.gov.in
11.	Jharkhand Council on Science, Technology and Innovation	Jharkhand	Executive Director - jharkhandcouncilonsct@gmail.com
12	Administrative Secretary, Science and Technology	Ladakh	
13	Department of Science and Technology, Lakshadweep	Lakshadweep	lk-dst@nic.in
14.	Goa State Council of Science & Technology	Goa	Chairman - ms-gscst.goa@nic.in
15.	Gujarat Council on Science & Technology	Gujarat	Advisor and Member Secretary - gujcost@gujarat.gov.in
16.	Haryana State S&T Council	Haryana	Directorate of Science & Technology, Haryana. Telephone: 0172-2560339

S.No	Name of the Council/Department	State/UT	Point of Contact
17.	State Council for Science &Technology and Environment, Himachal Pradesh	Himachal Pradesh	Joint Member Secretary - sattri-env-hp@nic.in
18.	Karnataka State Council for Science & Technology	Karnataka	Secretary - secretary@kscst.org.in
19.	Kerala State Council for Science, Technology and Environment	Kerala	Executive VP and ex officio Principal Secretary S&T Department - evp.kscste@kerala.gov.in
20.	Madhya Pradesh Council of Science & Technology	Madhya Pradesh	Director General - dg@mpcost.nic.in
21.	Manipur Science & Technology Council	Manipur	Office - mastec@nic.in
22.	Meghalaya State Council of Science, Technology and Environment	Meghalaya	Office - stcouncil-megh@meghalaya.gov.in
23.	Mizoram Science, Technology & Innovation Council	Mizoram	Chief Scientific Officer and Member Secretary - cso.dst-miz@gov.in
24.	Nagaland Science and Technology Council	Nagaland	Joint Secretary and Ex officio Director - dir.scitech-ngl@nic.in
25.	Department of Science and Technology, Odisha	Odisha	dstsec.or@nic.in
26.	Puducherry Council for Science and Technology	Puducherry	Director (Science & Technology) - dste@py.gov.in
27.	Punjab State Council for Science, Technology & Environment	Punjab	Executive Director - Pritpal. singh8@Punjab.gov.in
28.	Department of Science and Technology, Rajasthan	Rajasthan	Commissioner and Secretary - secretary. dst@rajasthan.gov.in
29.	Rajiv Gandhi Science & Technology Commission	Maharashtra	rgstcmaha@rediffmail.com
30.	Sikkim State Council of Science & Technology	Sikkim	Pr. Secretary/Member Secretary secydst@gmail.com
31.	Tamil Nadu State Council for Science and Technology	Tamil Nadu	Member Secretary - ms.tanscst@nic.in
32.	Telangana Council of Science & Technology (TGCOST)	Telangana	Member secretary - secy_ tgcst@telangana.gov.in
33.	Tripura State Council for Science and Technology	Tripura	Member Secretary - ste.dept-tr@tripura.gov.in
34.	Uttarakhand State Council for Science and Technology	Uttarakhand	Director General - dg@ucost.in
35.	West Bengal State Council of Science and Technology	West Bengal	Administrative officer - wbscst@gmail.com

Table 24: List of state/UT S&T agencies with their PoC
(Source: Internal Team Compilation)

2.6 National Academies

The national science academies in India work for the promotion and recognition of scientific knowledge across disciplines. These academies play a crucial role in providing expert scientific counsel and promoting research collaboration. The key institutions within this category are outlined below:

I. Indian National Science Academy (INSA)

Point of Contact
Executive Director,
Indian National Science Academy
exe.director@insa.nic.in

The Indian National Science Academy (INSA) was established in 1935 and is headquartered in New Delhi. The academy promotes and harnesses scientific knowledge in the country. The academy identifies and nurtures scientific talent within the country. The academy represents India in scientific unions and other international forums, coordinating and engaging in scientific initiatives globally.

II. Indian Academy of Sciences (IASc)

Point of Contact
President,
Indian Academy of Sciences
office@ias.ac.in

The Indian Academy of Sciences was founded in 1934 and is situated in Bengaluru. The academy focuses on research in both pure and applied branches of science. The academy specifically lays special emphasis on offering fellowships to young scientific talent along with publishing high-quality journals in the field of pure and applied sciences.

III. National Academy of Sciences, India (NASI)

Point of Contact
Executive Secretary,
National Academy of Sciences, India
es@nasi.ac.in

The National Academy of Sciences, India (NASI) was founded in 1930 and is situated in Prayagraj. It is the oldest science academy in the country. The academy promotes science and technology in all its branches and provides a national forum for scientists to exchange views and publish their research. The academy publishes the Proceedings of the National Academy of Sciences, India, and National Academy Science Letters.

IV. Indian National Academy of Engineering (INAE)

Point of Contact
President, Indian National Academy of Engineering
president@inae.in

The Indian National Academy of Engineering (INAE) was founded in 1987 and is situated in New Delhi. The INAE promotes the practice of engineering and technology in the country. By leveraging research and innovation in these fields, the academy focuses on providing solutions towards problems of national importance.

V. National Academy of Biological Sciences (NABS)

Point of Contact
Chairperson
djbagyaraj@gmail.com

The National Academy of Biological Sciences was founded in 2004 and is located in Chennai. The academy promotes new scientific knowledge in the fields of basic and applied biological sciences, including Agriculture, Animal Sciences, and Forestry. The academy facilitates interaction among biologists, industry, research, and academic institutions to facilitate technology transfer.

VI. National Academy of Medical Sciences (NAMS)

Point of Contact
Secretary,
National Academy of Medical Sciences
namsaca01@gmail.com

The National Academy of Medical Sciences was established in 1961 and is located in New Delhi. The academy focuses on scientific research and the promotion of knowledge in the field of medical sciences. In collaboration with the newly established All India Institutes of Medical Sciences at Bhopal, Bhubaneswar, Jodhpur, Patna, Raipur, and Rishikesh, the academy has a collegium for academic exchange.

VII. National Environmental Science Academy (NESA)

Point of Contact
infonesa88@gmail.com

The National Environmental Science Academy was established in 1984 and is headquartered in New Delhi. The main focus of the academy is to raise environmental awareness among the population and find sustainable solutions for the benefit of society. The academy engages in various outreach programmes by organising seminars, conferences, workshops, and symposiums. In terms of academic research, the academy publishes journals and conducts training programmes to promote knowledge of environmental sciences.

VIII. National Academy of Agricultural Sciences (NAAS)

Point of Contact
naas-mail@naas.org.in

The National Academy of Agricultural Sciences (NAAS) was established in 1990 and is located in New Delhi. The academy promotes knowledge in the agricultural sciences, including crop and animal husbandry, fisheries, and agroforestry. The academy recognises excellence among agricultural scientists through its fellowships and awards. It brings together experts from research and academic institutions to provide evidence-based inputs for agricultural policy through its policy papers.

2.7 Industry Bodies

India has several industry associations that serve as a connecting arm between the government, industry and civil society. These associations help enable dialogue across stakeholders on policy issues concerning the Indian industry. There are multi-sectoral industry associations as well as sector-specific associations. The following table lists some major industry associations in India (in alphabetical order):

I. Multi-Sectoral Industry Associations

Name of the Industry Association	Point of Contact
Associated Chambers of Commerce and Industry of India (ASSOCHAM)	assocham@nic.in
Confederation of Indian Industry (CII)	info@cii.in
Federation of Indian Chambers of Commerce & Industry (FICCI)	ficci@ficci.com
PHD Chamber of Commerce and Industry	sg@phdcci.in
Startup Policy Forum (SPF)	shweta@indiaspf.org

II. Sector Specific Associations

Name of the Industry Association	Point of Contact
Data Security Council of India (DSCI)	vinayak.godse@dsci.in
Drone Federation India (DFI)	smit@dronefederation.in
Indian Cellular and Electronics Association (ICEA)	icea@icea.org.in
Indian Space Association (IsPA)	dg@ispa.space
Internet and Mobile Association of India (IAMAI)	info@iamai.in
National Association of Software and Service Companies (NASSCOM)	rnambiar@nasscom.in
Quantum Ecosystems Technology Council of India (QETCI)	ceo@qetci.org

Table 25: List of Industry Bodies with their PoC
(Source: Internal Team Compilation)

Abbreviations

AI
Artificial Intelligence

AI-SE
AI for Science and Engineering

AIC
Atal Incubation Centre

AICTE
All India Council for Technical Education

ANRF
Anusandhan National Research Foundation

ASSOCHAM
Associated Chambers of Commerce and Industry of India

ATL
Atal Tinkering Lab

ATRI
ANRF Translational Research & Innovation

AYUSH
Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy

BIG
Biotechnology Ignition Grant

Bio-NEST
BioIncubators Nurturing Entrepreneurship for Scaling Technologies

BioE3
Biotechnology for Economy, Environment and Employment

BIPP
Biotechnology Industry Partnership Programme

BIRAC
Biotechnology Industry Research Assistance Council

BRIC
Biotechnology Research & Innovation Council

BWR
Boiling Water Reactors

CII
Confederation of Indian Industry

CoE
Centre of Excellence

CPS
Cyber-Physical Systems

CRM
Critical Raw Materials

DAE
Department of Atomic Energy

DBT
Department of Biotechnology

DFI
Drone Federation India

DHE
Department of Higher Education

DoS
Department of Space

DoT
Department of Telecommunications

DPIIT
Department for Promotion of Industry and Internal Trade

DRDO
Defence Research & Development Organisation

DSCI
Data Security Council of India

DSIR
Department of Scientific and Industrial Research

DST
Department of Science and Technology

E-YUVA
Empowering Youth for Undertaking Value-Added Innovations

ETG
Empowered Technology Group

EV
Electric Vehicle

FAME
Faster Adoption and Manufacturing of (Hybrid & Electric) Vehicles in India

FDI
Foreign Direct Investment

FICCI
Federation of Indian Chambers of Commerce & Industry

FY
Financial Year

IAMAI
Internet and Mobile Association of India

IAS
Indian Academy of Sciences

IBDC
Institute of Bioresources and Sustainable Development

ICAR
Indian Council of Agricultural Research

ICEA
Indian Cellular and Electronics Association

iCET
Initiative on Critical and Emerging Technology

ICFRE
Indian Council of Forestry Research & Education

ICGEB
International Centre for Genetic Engineering and Biotechnology

ICMR
Indian Council of Medical Research

ICSSR
Indian Council of Social Science Research

IMD
India Meteorological Department

IN-SPACe
Indian National Space Promotion and Authorisation Centre

INAE
Indian National Academy of Engineering

INSA
Indian National Academy of Sciences

IsPA
Indian Space Association

IVCOL
Indian Vaccine Corporation Ltd

MAHA
Mission for Advancement in High Impact Areas (MedTech and EV Missions)

MEA
Ministry of External Affairs

MeitY
Ministry of Electronics and Information Technology

MNRE
Ministry of New and Renewable Energy

MoCA
Ministry of Civil Aviation

MoEFCC
Ministry of Environment, Forest and Climate Change

MoES
Ministry of Earth Sciences

MoST
Ministry of Science and Technology

MSME
Micro, Small and Medium Enterprises

NAAC
National Assessment and Accreditation Council

NAMS
National Academy of Medical Sciences

NASSCOM
National Association of Software and Service Companies

NBM
National Broadband Mission

NCD
Non-Communicable Diseases

NCMM
National Critical Mineral Mission

NEP
National Education Policy

NER
North Eastern Region

NESA
National Environmental Science Academy

NICRA
National Innovations in Climate Resilient Agriculture

NITI Aayog
National Institution for Transforming India

NM-ICPS
National Mission on Interdisciplinary Cyber-Physical Systems

NQM
National Quantum Mission

NSA
National Security Adviser

NSCS
National Security Council Secretariat

NSIL
NewSpace India Ltd.

ONDC
Open Network for Digital Commerce

OPSA
Office of the Principal Scientific Adviser to the Government of India

PACE
Promoting Academic Research Conversation to Enterprise

PCIM&H
Pharmacopoeia Commission for Indian Medicine & Homoeopathy

PEMD
Power Electronics, Machines and Drives

PHDCCI
PHD Chamber of Commerce and Industry

PHWR
Pressurised Heavy Water Reactors

PM-STIAC
Prime Minister's Science, Technology, and Innovation Advisory Council

PoC
Point of Contact

PSA
Principal Scientific Adviser

PSE
Public Sector Enterprise

PSU
Public Sector Undertaking

QETCI
Quantum Ecosystems Technology Council of India

R&D
Research and Development

RCB
Regional Centre for Biotechnology

RDI Fund
Research, Development and Innovation Fund

S&T
Science and Technology

SBIRI
Small Business Innovation Research Initiative

SDGs
Sustainable Development Goals

SHIP
Strategic Hydrogen Innovation Partnership

SLFM
Second-Level Fund Manager

SME
Small and Medium Enterprises

SPARSH
Social Innovation Programme for Products: Affordable & Relevant to Societal Health

SPF
Startup Policy Forum

STI
Science, Technology and Innovation

TAF
Technology Adoption Fund

TAG
Technology Advisory Group

TDB
Technology Development Board

TDF
Technology Development Fund

TDSAT

Telecom Disputes Settlement and Appellate Tribunal

TIH

Technology Innovation Hub

TRL

Technology Readiness Level

TSI

Technology Security Initiative (India-UK)

TTDF

Telecom Technology Development Fund

UGC

University Grants Commission

UT

Union Territory

Tables

Table 1
List of Research Institutions under DST with their PoC

Table 2
List of Attached Institutions under DST (Service Organisations) with their PoC

Table 3
List of Research Institutions under DBT with their PoC

Table 4
List of PSUs under DBT with their PoC

Table 5
List of CSIR Labs and Research Institutes along with their respective PoCs

Table 6
List of PSUs under DSIR with their PoC

Table 7
List of Research Institutions under DAE with details of their respective PoCs

Table 8
List of PSUs under DAE with their PoC

Table 9
List of DRDO research labs and centres with their PoC

Table 10
List of all research centres under ISRO, along with their respective PoC

Table 11
Affiliated Bodies under DoS with PoC

Table 12
List of Research Institutions under MoES

Table 13
R&D organisations under MeitY with PoC

Table 14
Centres under C-DAC with their PoC

Table 15
List of Centres under C-MET with their PoC

Table 16
List of SAMEER research centres with PoC

Table 17
Affiliated Institutions under MeitY with PoC

Table 18
List of Research Institutions under DoT with their PoC

Table 19
List of PSUs under DoT with their PoC

Table 20
Research Labs and Institutes under ICMR

Table 21
List of research Institutes under ICAR with their PoC

Table 22
List of research Institutes under ICSSR with their PoC

Table 23
List of research Institutes under ICFRE with their PoC

Table 24
State/UT S&T agencies with their PoC

Table 25
List of Industry Bodies with their PoC

Figures

Figure 1
Representation of the STI Architecture in India

India STI Outlook 2026

Chapter III

Metrics

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

India's STI ecosystem comprises a broad network of skilled human capital, research institutions, industry, and innovation infrastructure that support research, technological development, and innovation. This chapter provides an overview of the key components of this ecosystem, covering R&D investment, STEM and research talent, higher education, R&D performing organisations, innovation enablers, the industrial and startup landscape, research and knowledge capacity, patents, high-technology exports, and India's performance in the Global Innovation Index. The chapter is intended to provide an understanding of the scale, structure, capabilities, and key trends that define India's contemporary STI ecosystem.

Outline

3.1 Investments in R&D **82**

I. GERD as % of GDP 82

II. R&D Expenditure Sector-Wise (Objective) 84

III. Foreign Direct Investment (FDI) in R&D 84

3.2 Human Capital in S&T **86**

I. STEM Enrolment Trend in India 86

II. STEM Graduates in India 87

III. Engineering and Technology Focus Enrolment Trend 89

IV. Full-Time Equivalent researchers in R&D 90

3.3 Higher Education Ecosystem **93**

I. Institute of National Importance 93

II. Higher Education Structure in India 95

III. Vocational Skill Institutions 96

3.4 R&D Performing Organisations **98**

I. Central Public R&D organisation 98

II. State Public R&D centres 101

III. Private R&D centres 104

3.5 Innovation Enablers **106**

I. Incubators and Accelerators in the Indian Innovation Ecosystem 106

II. Research Park 109

III. Non-University Innovation Hubs and Technology Clusters 114

3.6 India's Industrial Ecosystem **117**

I. The startup sector in India 117

II. Private investments in India from 2016-2025 124

III. India's Micro, Small and Medium Enterprise (MSME) sector 125

IV. The technology sector in India 126

3.7 Knowledge Capacity 129

I. India's domestic research landscape 131

II. Indian knowledge hotspots based on publications in top journals 136

3.8 Patents 138

I. Total patent applications filed and granted between 2015-2024 138

II. Patent publications - categorised by technology (between 2024-2025) 140

III. Top countries filing in India (through PCT route) - 2024 141

IV. Patent applications filed in 2024-2025 according to state of origin 141

3.9 High Technology Export 142

I. India's overall trade balance 142

II. India's Global Export Share in High-Technology Products 142

III. High-Technology exports as a share of India's total exports 143

IV. Major Export and Import Products from India (2020–2025) 143

3.10 Global Innovation Index: India's Recent Performance and Key Signals 145

Abbreviations 146

Figures 150

Tables 151

3.1 Investments in R&D

I. GERD as % of GDP

India's Gross Expenditure on Research and Development (GERD) has increased from ₹60,196.75 crore in 2010–11 to ₹2,44,767.81 crore in 2023–24. Over the same period, GERD as a share of GDP increased from 0.77% to 0.84% in 2023–24. The latest NSTMIS estimates indicate a further increase in GERD to ₹2,76,196.13 crore in 2024–25 and ₹3,13,007.02 crore in 2025–26, equivalent to 0.87% and 0.90% of GDP, respectively. The figures for 2024–25 and 2025–26 are estimates based on sector-wise growth trends [13].

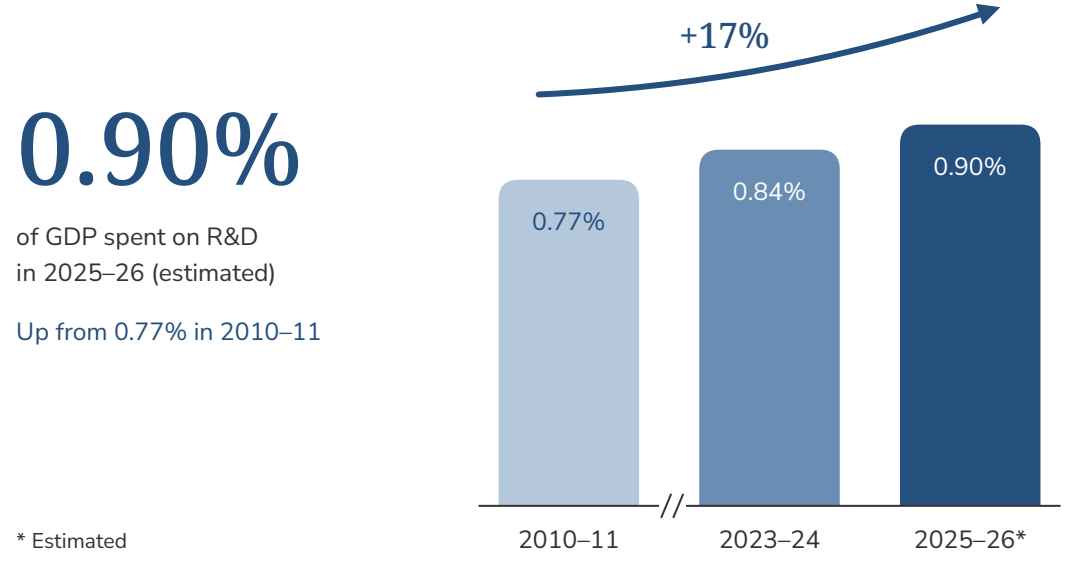


Fig 1. Increase in GERD as a share of GDP

During this period, the sectoral R&D investment has also changed. In 2020-21, public sector investment accounted for around 63.6% of total R&D investment, and private investment accounted for around 36.4%. By 2023-24, private-sector investment increased to 51.85% of total R&D investment, while public-sector investment stood at 48.15%. In absolute terms, private R&D investment was ₹1,26,906.60 crore in 2023–24, while public investment was ₹ 1,17,861.21 crore. This points to a transition toward a more balanced public-private R&D financing in India.

[13] Department of Science and Technology, Ministry of Science and Technology, Government of India, "R&D Statistics at a Glance 2025–26," Department of Science and Technology, New Delhi, India, 2026. [Online]. Available: https://dst.gov.in/sites/default/files/ST%20INDICATORS%20TABLES%202025-26.pdf.

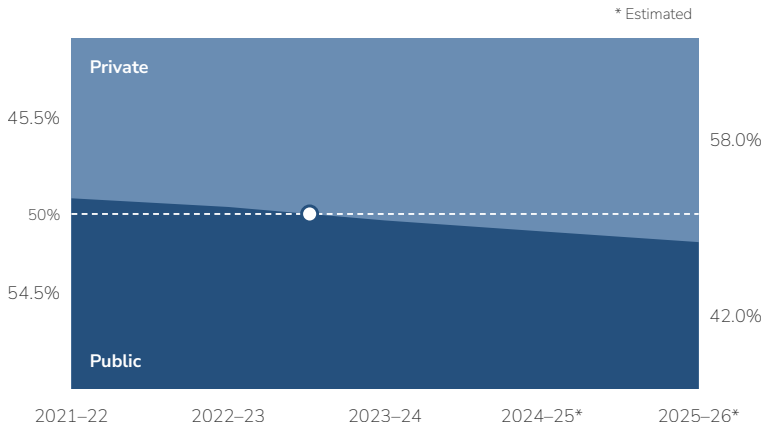


Fig 2. Public and Private Investment in National R&D

Business Enterprise R&D (BERD), which includes R&D expenditure by public and private sector industries, increased from ₹51,983.68 crore in 2020-21 to ₹1,20,609.18 crore in 2023-24. This indicates a growing role of industry in India's national R&D ecosystem.

Alongside the increase in private participation in national R&D, India is establishing a more consolidated, mission-oriented architecture to further expand R&D investment and mobilise long-term private capital through the following initiatives:

- **The Anusandhan National Research Foundation (ANRF)**, established under the ANRF Act, 2023, is designed to provide strategic direction, competitive funding, and pathways for collaboration among industry, academia, and government [14].

- **The Research, Development and Innovation (RDI) Fund** has a total outlay of ₹1 lakh crore over six years, including ₹20,000 crore in FY 2025–26. It is structured to catalyse private investment in high-technology R&D, support higher-TRL projects, enable the acquisition of strategically important technologies, and facilitate deep-tech financing [15]. This is complemented by the Startup India Fund of Funds 2.0, with a corpus of ₹10,000 crore, aimed at mobilising domestic capital for deep-tech, technology-driven manufacturing and other innovation-led enterprises [16].

[14] Department of Science and Technology, Ministry of Science and Technology, Government of India, "Anusandhan National Research Foundation (NRF)," Department of Science and Technology, New Delhi, India, 2023. [Online]. Available: https://dstthe the following.gov.in/sites/default/files/NRF.pdf to expand R&D investment further.

[15] Ministry of Science and Technology, Government of India, "Annexure Referred to in Reply to Part (a) to (e) of Rajya Sabha Starred Question No. 130 Regarding Initiatives to Promote Innovation and Entrepreneurship," Sansad TV, Government of India, Jul. 23, 2025. [Online]. Available: https://sansad.in/getFile/annex/268/AS130_Ojtt4R.pdf?source=pqars.

[16] Prime Minister's Office, Government of India, "Cabinet Approves Startup India Fund of Funds 2.0 to Mobilize Venture Capital for India's Startup Ecosystem," Press Information Bureau, Feb. 14, 2026. [Online]. Available: https://www.pmindia.gov.in/en/news_updates/cabinet-approves-startup-india-fund-of-funds-2-0-to-mobilize-venture-capital-for-indias-startup-ecosystem/.

II. R&D Expenditure Sector-Wise (Objective)

The latest DST–NSTMIS data provide sector-wise R&D expenditure through 2023–24 and mention where India's research investment is concentrated. Industrial Production and Technology recorded the highest R&D expenditure at ₹53,748.29 crore, followed by Health at ₹45,812.06 crore and Defence at ₹28,779.32 crore. R&D expenditure on Transport, Telecommunication, and other Infrastructures was ₹19,355.21 crore, while Development of Agriculture, Forestry, and Fishing accounted for ₹16,803.75 crore (Table 12, Expenditure on R&D by Objectives, R&D statistics 2025-26). The distribution reflects a combination of strategic, industrial and developmental priorities. It shows that a large share of R&D expenditure is concentrated in industrial production, health and defence, while agriculture, energy and infrastructure also remain important areas of investment.

The report also highlights that public research institutions continue to support this broader research in key sectors. In 2023–24, the Indian Council of Agricultural Research (ICAR) R&D expenditure was ₹9,176.45 crore, compared with ₹6,358.66 crore in 2020–21. Over the same period, R&D expenditure by the Indian Council of Medical Research (ICMR) increased from ₹1,580.78 crore to ₹2,343.18 crore (Fig 4).

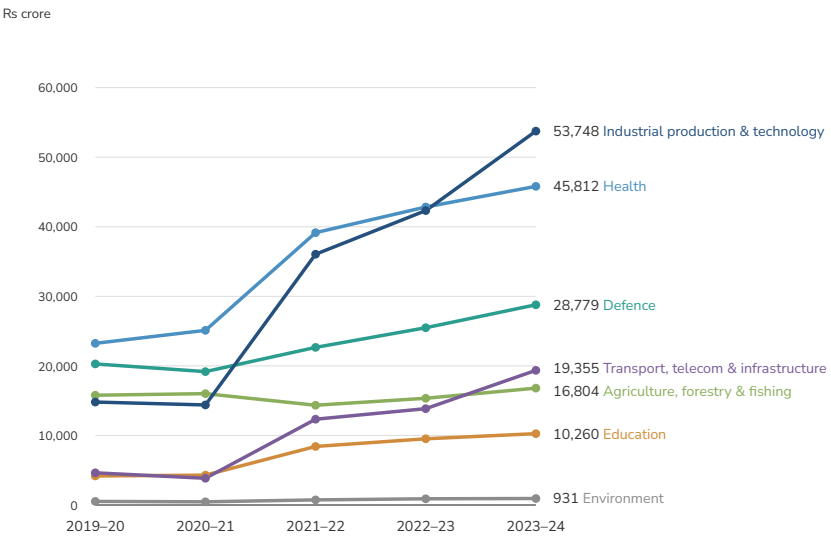


Fig 3. Select sector-wise expenditure on R&D

III. Foreign Direct Investment (FDI) in R&D

Foreign direct investment (FDI) equity inflows into R&D in India rose from Rs. 4,138.87 crore (US$55.77 million, 0.09% of total FDI equity inflows) in 2020 to a peak of Rs. 5,146.33 crore (US$621.69 million, 2% of total inflows) in 2023. Along with India's own outward investment in frontier technology and R&D, year-wise

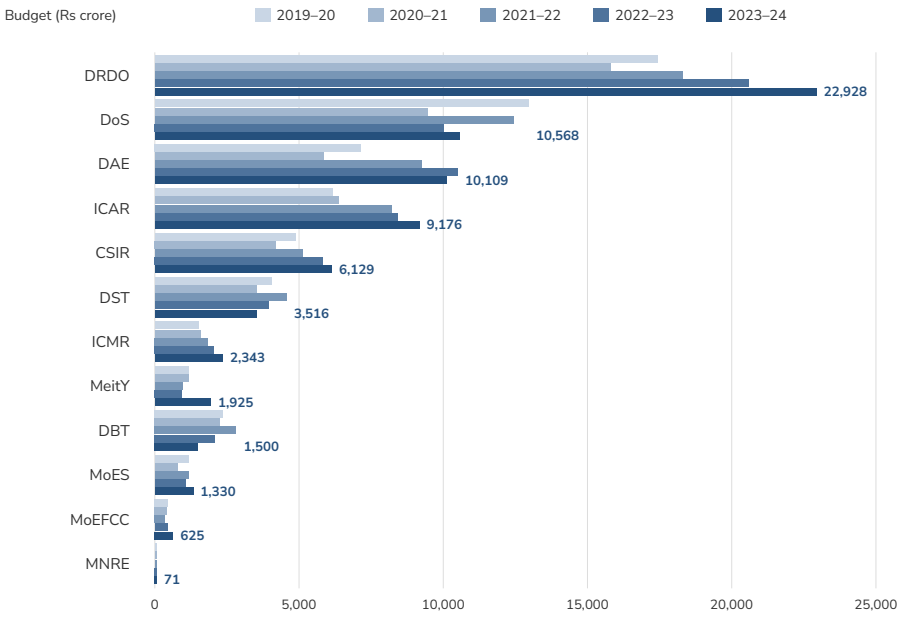


Fig 4. Expenditure On R&D by Select Major Scientific Agencies

R&D-related FDI inflows are analysed in more detail from DPIIT data as part of India's broader international S&T engagement in Chapter 5, Section 5.3 (III. International Investment Outlook).

While global FDI flows have recently been volatile due to macroeconomic uncertainty and tightening financial conditions [17], international assessments such as UNCTAD's World Investment Report highlight a growing emphasis on technology-intensive, innovation-driven investment projects, particularly in digital technologies, life sciences, and advanced manufacturing [18]. Within this context, the rise in India's R&D-linked FDI, especially the 2023 surge, signals increased global engagement with India's high-technology and research ecosystem.

The trend suggests that R&D is gradually becoming a more visible component of India's FDI. Even with year-to-year fluctuations, the data indicate a structural broadening of investment toward research-anchored and knowledge-intensive activities, which have the potential to generate technology spillovers, strengthen domestic innovation capabilities, and deepen India's integration into global innovation networks.

[17] Department of Economic Affairs, Ministry of Finance, Government of India, "External Sector: Stability Amid Plenty," in *Economic Survey 2023–24*, New Delhi, India: Ministry of Finance, 2024, ch. 4. [Online]. Available: https://www.indiabudget.gov.in/budget2024-25/economicsurvey/doc/eschapter/echap04.pdf.

[18] United Nations Conference on Trade and Development, *World Investment Report 2025: International Investment in the Digital Economy*, Geneva, Switzerland: United Nations, Jun. 2025. [Online]. Available: https://unctad.org/publication/world-investment-report-2025.

3.2 Human Capital in S&T

This section provides an understanding of the human capital in India's science and technology ecosystem. It first examines STEM enrolment trends in higher education using AISHE data to establish the scale and continuity of India's STEM participation. Then it reviews STEM graduation outcomes, including a comparative perspective using UNESCO education statistics, with a focus on male–female participation patterns and gender gaps. The section then narrows to engineering and technology sub-stream enrolments to identify where applied technology capacity is concentrated and how it is evolving towards emerging disciplines such as artificial intelligence and quantum technologies. Finally, it presents R&D workforce indicators, including full-time equivalent (FTE) researchers and industrial R&D employment, to provide a view of India's research participation and the depth of its research-active talent base.

I. STEM Enrolment Trend in India

India's higher education enrolment data indicate that the country's STEM talent base is at scale and steadily deepening. STEM enrolment in India increased from 9.76 million in 2016–17 to 10.19 million in 2023–24, a 4.4% increase [19] [20]. A significant change is observed in the gender composition of STEM enrolment. Female enrolment increased from 3.89 million in 2016–17 to 4.48 million in 2023–24, which is an increase of around 15.1%. It means the female share of total STEM enrolment increased from 39.91% to 44.00%. This indicates the expansion of India's STEM talent base by a gradual narrowing of the gender gap in STEM participation. In absolute terms, India had 10,188,988 students enrolled in STEM [21] courses in 2023-2024, including 5,706,160 male and 4,482,828 female students.

[19] Department of Higher Education, Ministry of Education, Government of India, "All India Survey on Higher Education 2023–24," Ministry of Education, New Delhi, India, 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s392049debbe566ca5782a3045cf300a3c/uploads/2026/07/20260713160242177O.pdf.

[20] Department of Higher Education, Ministry of Education, Government of India, "All India Survey on Higher Education 2020–21," Ministry of Education, New Delhi, India, 2023. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s392049debbe566ca5782a3045cf300a3c/uploads/2025/06/2025060416127000081.pdf.

[21] STEM include Science, including Mathematics, and Engineering & Technology, covering UG, PG, Integrated, M.Phil. and Ph.D. levels.

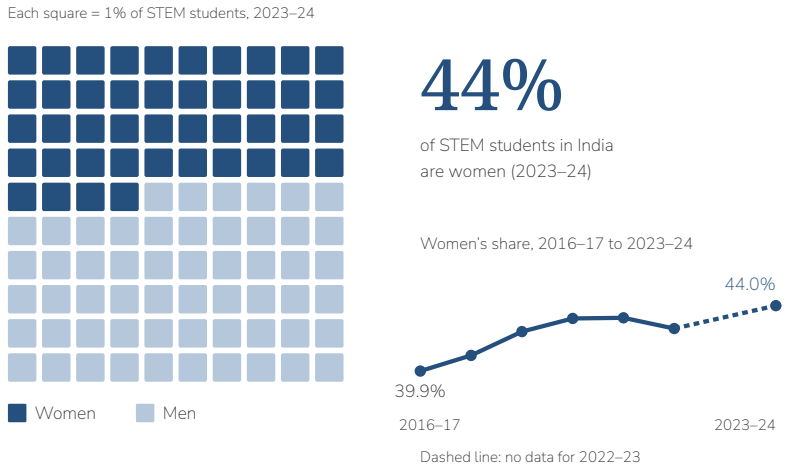


Fig 5. STEM Enrolment in India: Gender Composition (2016-17 to 2023-24)

Source: AISHE report 2021-22 & 2020-21, 2023-24 Ministry of Education.

Accessed on Aug 13, 2026.

II. STEM Graduates in India

Percentage of Total STEM Graduates Country-wise

According to UNESCO Institute for Statistics (UIS) data. India accounted for 30.69% of graduates from STEM programs in 2021. It shows that nearly one in three tertiary graduates in India is from a STEM field. In the comparison presented with selected countries in fig. 6, India is behind Singapore (35.94%) and Germany (35.14%), and ahead of Canada (26.19%), France (25.55%), Sri Lanka (24.47%), the United Kingdom (22.26%), the United States (20.07%), and South Africa (18.71%) [22]. The relatively high STEM share indicates that India's higher-education system produces a strong STEM-oriented graduate. It is an enabler of technology adoption and innovation-led growth. Due to the absence of data, the international comparison is limited to 2021.

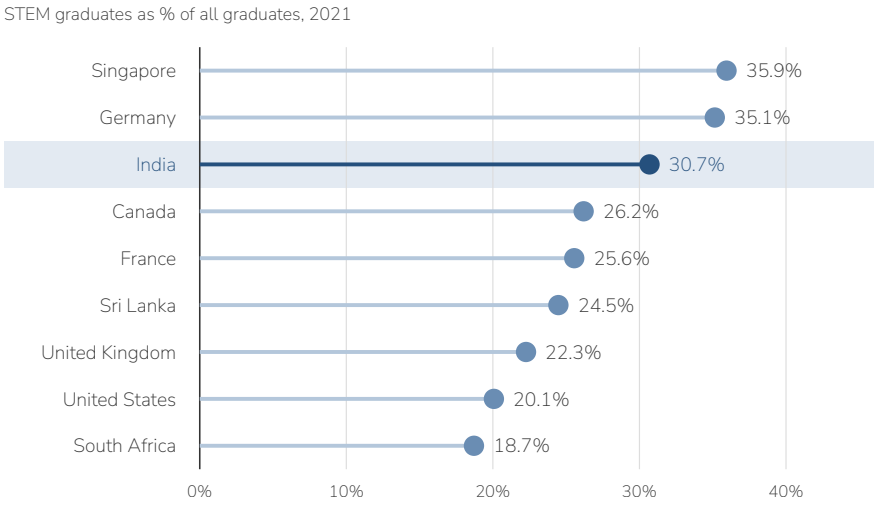


Fig 6. Total STEM Graduates in India (2021)

Source: UNESCO Education Statistics,

Accessed on Feb. 11, 2026.

[22] UNESCO Institute for Statistics, "Percentage of Graduates from Tertiary Education Programmes in STEM Programmes (Both Sexes)," World Bank Data360, 2026. [Online]. Available: https://data360.worldbank.org/en/indicator/UNESCO_UIS_GRAD_STEM . [Accessed: Feb. 11, 2026].

Percentage of Male and Female STEM Graduates Country-Wise

Using a similar dataset, Fig. 7 presents the percentages of male and female graduates in STEM. The graph also presents the gender gap, measured as the difference between the shares of male and female STEM graduates, expressed in percentage points.

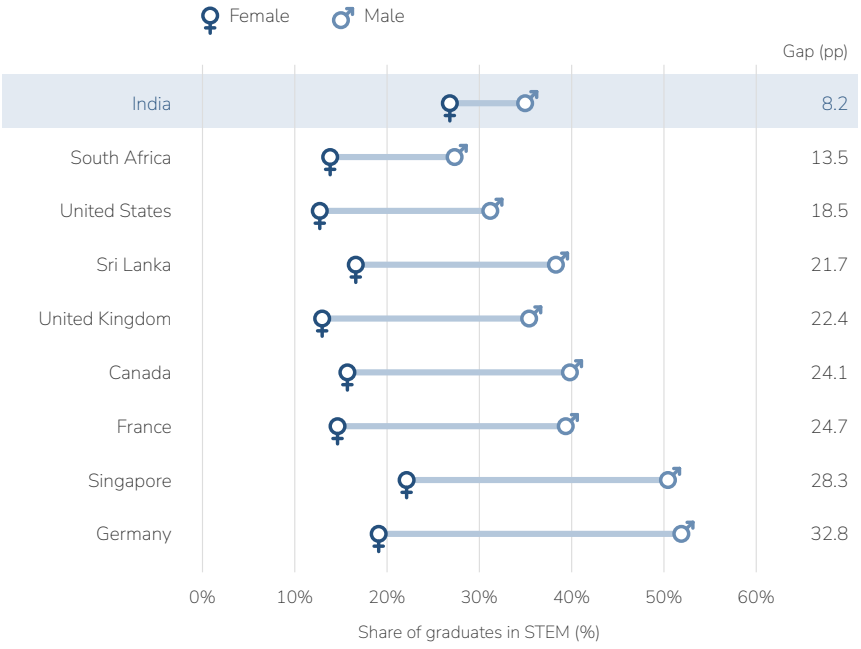


Fig 7. Gender Gap in STEM Graduates Country-Wise (2021)

Source: UNESCO Education Statistics,

Accessed on Feb. 11, 2026.

Among the countries represented, India stands out for its relatively balanced STEM graduation outcomes. India reported that 34.96% of STEM graduates were male and 26.80% were female in 2021. It implies a gender gap of 8.16 percentage points, the lowest among the countries shown (for example, the United States has a gap of 18.47 pp; the United Kingdom, 22.42 pp; Germany, 32.79 pp; Singapore, 28.31 pp). India also records the highest share of female STEM graduates in this group (26.80%), exceeding Singapore (22.12%) and Germany (19.09%), and outperforms high-income countries such as the US, France, and Canada. India is among the highest in STEM graduates, while also standing out for relatively strong female representation in STEM graduation outcomes[23]. For 2021, comparable data for both male and female STEM graduates were available for 89 countries. Among the countries and areas with available data, India had the sixth-smallest gender gap in STEM.

[23] UNESCO Institute for Statistics, "Percentage of Graduates from Tertiary Education Programmes in STEM Programmes (Both Sexes)," World Bank Data360, 2026. [Online]. Available: https://data360.worldbank.org/en/indicator/UNESCO_UIS_GRAD_STEM . [Accessed: Feb. 11, 2026].

This pattern has relevance to global development commitments. The 2030 Agenda for Sustainable Development, particularly SDG 5 (Gender Equality), calls for empowering all women and girls and reducing structural barriers to equal participation and opportunity. It may indicate that India's improved inclusion of women in STEM education and skills pathways supports broader SDG objectives by strengthening innovation capacity, workforce participation, and inclusive growth outcomes[24].

III. Engineering and Technology Focus Enrolment Trend

In the AISHE report, the pattern of enrolment in Engineering & Technology indicates where India's applied technology capacity is concentrated. In 2023–24, total Engineering & Technology enrolment across UG, PG, Integrated, M.Phil., and PhD levels exceeded 4.63 million. Computer Engineering was the single largest sub-stream, with around 1.84 million students, followed by Electronics Engineering (0.57 million), Mechanical Engineering (0.44 million), Civil Engineering (0.36 million), Electrical Engineering (0.34 million), and Information Technology (0.24 million). These core disciplines constitute a substantial part of India's engineering and technology talent base and support digital systems, infrastructure development, manufacturing, power and electronics. These capabilities underpin both industrial competitiveness and the diffusion of frontier technologies across sectors.

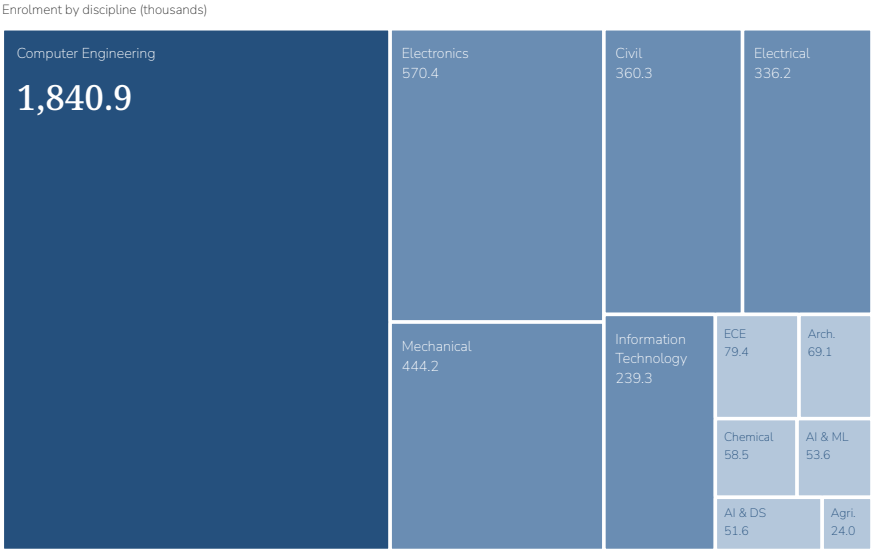


Fig 8. Top 12 Substreams of Engineering & Technology (by Enrolment)

Source: AISHE report 2023-24, Ministry of Education.

[24] United Nations Department of Economic and Social Affairs, "Goal 5: Achieve Gender Equality and Empower All Women and Girls," Sustainable Development Knowledge Platform, United Nations, 2026. [Online]. Available: https://sdgs.un.org/goals/goal5 . [Accessed: Mar. 1, 2026].

Further, the engineering pipeline is diversifying into frontier and emerging technology disciplines, and these programs are now captured as distinct enrolment categories in national higher education statistics [25].

In recent years, the engineering pipeline has been diversifying into frontier and emerging technology disciplines, which are now captured as distinct enrolment categories in national higher education statistics. At the undergraduate level in 2023–24, 53,571 students were enrolled in Artificial Intelligence & Machine Learning, 51,570 in Artificial Intelligence & Data Science, 17,927 in Data Science, and 13,988 in Artificial Intelligence. The increase in enrollment in AI-related disciplines over a short period indicates that emerging technology programs are expanding rapidly within the higher education system.

This shift is further reinforced by targeted talent-development pathways under the IndiaAI Mission, including the IndiaAI fellowship initiative under its FutureSkills pillar. The program has supported undergraduate and postgraduate students undertaking applied AI projects. At the ecosystem level, the fellowship framework has been scaled to support 13,500 scholars (including 8,000 undergraduates, 5,000 postgraduates, and 500 PhD researchers). It is positioned as interdisciplinary and open to students across fields such as engineering, medicine, law, commerce, business, and the liberal arts [26].

IV. Full-Time Equivalent researchers in R&D

R&D workforce indicators show that India's human capital base is not only large in terms of enrolment but is also strengthening in research participation. According to the R&D Statistics report 2025-26, the number of researchers per million people in India has increased from 110.63 in 2000 to 354 in 2023, more than doubling over two decades. The latest data also indicate an improvement in women's participation in the R&D workforce. As of 1 April 2024, India had 5,07,351 FTE personnel directly engaged in R&D activities, of whom 1,47,119 were women, representing 29.0% of the total. Women also accounted for 28.8% of personnel engaged

[25] Department of Higher Education, Ministry of Education, Government of India, "All India Survey on Higher Education 2023–24," Ministry of Education, New Delhi, India, 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s392049debbe566ca5782a3045cf300a3c/uploads/2026/07/2026071316024217 70.pdf.

[26] IndiaAI, Ministry of Electronics and Information Technology, Government of India, "IndiaAI Fellowship Portal: Student Login," IndiaAI, 2026. [Online]. Available: https://fellowship.indiaai.gov.in/login .

in auxiliary activities and 37.7% of personnel in administrative activities within R&D establishments.

In total, women constituted 31.3% of the total FTE workforce captured across R&D establishments. This indicates continued progress in gender inclusion within the research workforce [27].

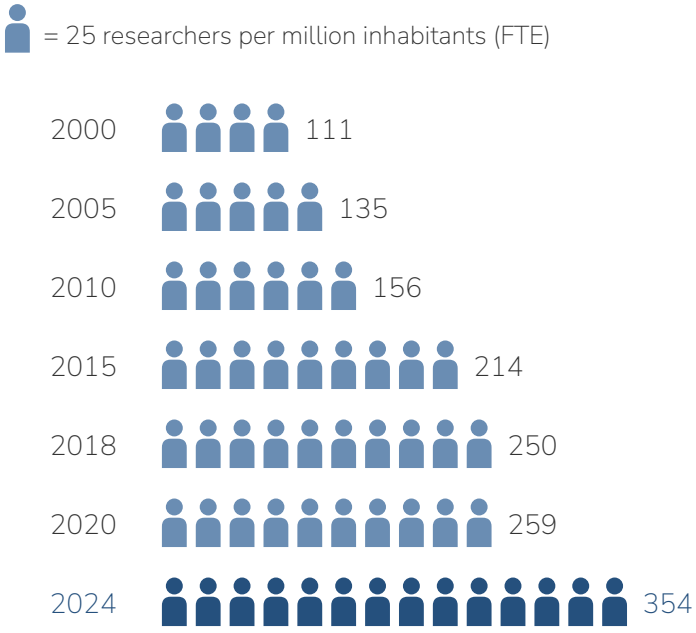


Fig 9: Researchers per million Inhabitants in India (2000-2024)
Source: R&D Development Statistics Report, DST, Ministry of Science and Technology (2019-20, 2022-23, 2025-26)
Accessed on Feb. 12, 2026.

The report also provides a broader picture of formal R&D employment across institutional and industrial sectors. There are 9,08,938 FTE personnel employed across R&D establishments, including 5,07,351 personnel directly engaged in R&D activities, 1,51,868 in auxiliary activities, and 2,49,719 in administrative activities. The institutional sector[28] accounted for 7,10,730 FTE personnel, while the industrial sector accounted for 1,98,208.

Within the institutional sector, higher education plays an important role in the research workforce. The higher education sector accounted for 2,38,728 FTE personnel directly engaged in R&D, representing around 47% of all FTE personnel engaged in R&D. It also accounted for 45,7,864 personnel when R&D, auxiliary, and

[27] Department of Science and Technology, Ministry of Science and Technology, Government of India, "Research and Development Statistics 2025–26," Department of Science and Technology, New Delhi, India, p. 32, 2026. [Online]. Available: https://dst.gov.in/sites/default/files/ST%20INDICATORS%20TABLES%202025-26.pdf .

[28] Institutional sector consist of GOVERNMENT INSTITUTIONS, Higher Education Sector, Scientific and Industrial Research Organisation (SIRO)

administrative activities were considered together. This highlights the growing importance of universities and higher education institutions in India's research ecosystem.

In the industrial sector, 1,98,208 FTE personnel are employed in R&D establishments, of whom 1,86,867 (94.3%) are in the private sector, and 11,341 (5.7%) are in the public sector. Of the total industrial R&D workforce, 1,49,384 FTE personnel were directly engaged in R&D activities.

The composition of the research workforce also indicates where technical capacity is concentrated. Among the 2,68,623 full-time R&D personnel for whom the field of specialisation is available, Engineering Technology accounts for 1,41,144 personnel, followed by Medical Sciences (61,910), Natural Sciences (32,528), and Agricultural Sciences (27,269). However, these figures exclude the higher education sector because field-specific specialisation data were not available.

3.3 Higher Education Ecosystem

This section outlines the institutional landscape that shapes India's higher education and skills ecosystem, focusing on how the system builds human capital and research capabilities in science, technology, and innovation. It begins with Institutes of National Importance (INIs), which serve as nationally designated benchmarks for advanced teaching, training, and research, and examines their state-wise distribution. It then describes the broader higher-education structure in India and the roles of national regulators and standard bodies, such as the UGC (University Grants Commission) and the All India Council for Technical Education (AICTE). Finally, the section covers developments in technical and vocational skills in India, including the scale and functions of industrial training institutes (ITIs) and major skilling initiatives, which together strengthen workforce readiness through long-term training, short-term upskilling, and industry-linked pathways.

I. Institute of National Importance

Institutes of National Importance (INIs) are premier higher-education and research institutions formally designated as nationally important through an Act of Parliament [29]. They are intended to serve as national benchmarks in their domains by building advanced human capital, supporting high-quality teaching and training, and strengthening research capability. India's legal framework for INIs is reflected in the fact that major institutional systems, such as the IITs, are constituted through parliamentary legislation to be "institutions of national importance".

The state-wise distribution shows that the INI's ecosystem has a wide national footprint. INIs are present across 32 states & UTs, with a total of 165 institutions. Uttar Pradesh has the highest count (15), followed by West Bengal (11). Gujarat, Madhya Pradesh, and Andhra Pradesh have 10 each.

The top five states together account for 56 INIs (over 34% of the total), which shows some concentration in major education hubs. At the same time, coverage is broad. 24 States/UTs have 1 to 6 INIs.

[29] Ministry of Education, Government of India, "Institutions of National Importance," Ministry of Education, 2026. [Online]. Available: https://www.education.gov.in/en/institutions-national-importance. [Accessed: Feb. 11, 2026].

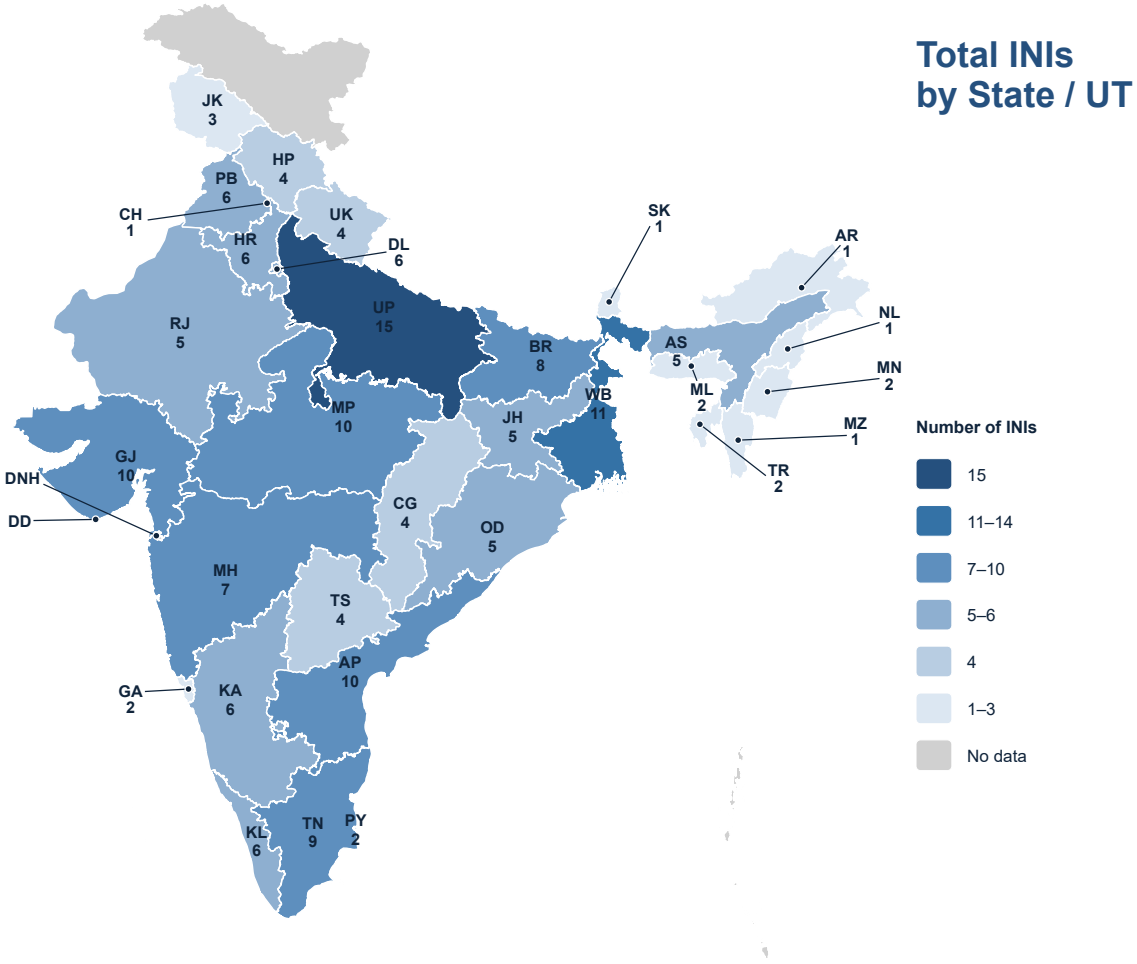


Fig 10. State-wise distribution of INIs in India

Source: Department of Higher Education, Ministry of Education.

Accessed on Feb. 11, 2026.

The presence of INIs in northeastern states such as Arunachal Pradesh, Mizoram, Nagaland, and Sikkim also indicates an emphasis on regional access and distributed capacity-building, which is crucial for enhancing educational opportunities and fostering local talent in these areas.

INIs cover multiple strategic disciplines, not only engineering. Engineering and technology form the largest share: 31 NITs, 25 IIITs, and 23 IITs. There are also 20 IIMs under INIs that strengthen management and leadership capacity, and 15 AIIMS that anchor advanced health education and clinical research. It also includes research-focused institutions such as 7 IISERs for science education and research, and 7 NIPERs for pharmaceutical education and research. These institutions support high-skill human capital across engineering, digital and IT disciplines, management, health, basic sciences, and pharmaceuticals, aligned with national S&T and development priorities. The detailed category-wise INIs are listed in Annexure 1.

Scan QR to access the Annexure 1

II. Higher Education Structure in India

A shared federal mandate shapes the higher education ecosystem in India. Under the Indian Constitution's Seventh Schedule, education, including technical Education, medical education, and universities, is placed in the Concurrent List, which means both the Union and State governments of India can legislate and act in this domain [30]. In practice, this enables national standard-setting and coordination alongside strong state-level institution-building and expansion.

This shared responsibility is visible in the breadth of India's higher-education institutional landscape. There are more than 1,270 universities in India. They are divided into four groups: Central Universities, State Public Universities, Deemed-to-be Universities, and State Private Universities. As of February 2026, the University Grants Commission[31] lists 57 central universities, 516 state universities, 150 deemed-to-be universities, and 547 private universities. In addition, the ecosystem is supported by a nearly 50,000-strong affiliated institutional network, which constitutes the backbone of mass undergraduate teaching and broad-based access[32].

While the University Grants Commission (UGC) Act, 1956, sets general standards for all universities, each category reflects a distinct institutional structure. A central university is established under a Central University Act[33]; a State University[34] is established and governed by specific acts passed by individual state legislatures; a private university is established by a sponsoring body, registered society, trust, or company through a specific act passed by the state legislature; and a Deemed-to-be University[35] is a high-performing institution notified by the central government under Section 3 of the UGC Act, 1956. These institutions have expanded the base of higher education in the country and offer educational and research facilities across various disciplines; they

[30] Ministry of External Affairs, Government of India, "Constitution of India, Art. 246, Sched. 7," Ministry of External Affairs, 2026. [Online]. Available: https://www.mea.gov.in/images/pdf1/S7.pdf . [Accessed: Feb. 11, 2026].

[31] The University Grant Commission (UGC), is a statutory body of Government of India, Ministry of Education, Department of Higher Education, constituted under the University Grants Commission Act, 1956 (3 of 1956), vested with two responsibilities: that of providing funds and that of coordination, determination and maintenance of standards in institutions of higher education

[32] University Grants Commission, "University Details," University Grants Commission, 2026. [Online]. Available: https://www.ugc.gov.in/universitydetails/university?type=ddmCMsxJZgXH2S/m0uMOKQ== . [Accessed: Feb. 14, 2026].

[33] Ministry of Education (formerly Ministry of Human Resource Development), Government of India, "The Central Universities Act, 2009 (Act No. 25 of 2009)," Ministry of Education, Mar. 20, 2009. [Online]. Available: https://www.education.gov.in/sites/upload_files/mhrd/files/upload_document/CentralUniversitiesAct.pdf.

[34] Department of Higher Education, Ministry of Education, Government of India, "State Universities," Ministry of Education, 2026. [Online]. Available: https://www.education.gov.in/en/state-universities

[35] Department of Higher Education, Ministry of Education, Government of India, "Deemed University," Ministry of Education, 2026. [Online]. Available: https://www.education.gov.in/en/deemed-university

enjoy the academic status and privileges of a university. In the latest National Institute of Ranking Framework (NIRF) University rankings, leading institutions include the Indian Institute of Science (Bangalore), IIT Delhi, IIT Madras, Vellore Institute of Technology, and Birla Institute of Technology & Science – Pilani (deemed/ private institution).

The quality and employability of technical graduates in higher education in India are strengthened by the AICTE. It is a statutory body established to support the coordinated development of technical education and to maintain norms and standards. It sets norms and standards, grants approvals for new institutions/ courses and intake changes, and supports quality development through mechanisms such as accreditation, while covering programmes across engineering, technology, pharmacy, architecture, management, and related technical domains [36].

For the training of technical teachers in this ecosystem, the National Initiative for Training of Technical Teachers (NITTT)[37] was established. It was notified under AICTE's statutory authority and designed as a structured induction pathway for newly recruited faculty and teachers with fewer than 5 years of experience in AICTE-recognised institutions and AICTE-approved university programs.

III. Vocational Skill Institutions

Alongside the university ecosystem, India has a large, well-structured layer of technical and vocational institutions that enhances workforce readiness through long-term training, short-term skilling, apprenticeships, and training-of-trainers programs. The Industrial Training Institutes (ITI) ecosystem is a core lever for improving employability and industry linkages. It is an anchored skill program, such as the Craftsmen Training Scheme, which is implemented by the Directorate General of Training through over 14,600 ITIs, with more than 6.58 lakh (2.6 million) trainees. Short-term and upskilling pathways are delivered through Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0, which operates through 14,843 accredited training centres; overall, PMKVY has trained and certified 1.64 crore (16.4 million) candidates.

[36] All India Council for Technical Education, "AICTE Official Portal," All India Council for Technical Education, 2026. [Online]. Available: https://aicte.gov.in/ . [Accessed: Feb. 14, 2026].

[37] National Testing Agency, Government of India, "National Initiative for Technical Teachers Training (NITTT) Examination Portal," National Testing Agency, 2026. [Online]. Available: https://nittt.nta.ac.in. [Accessed: Sep. 23, 2026]

The detailed list of enrolment under different skill programmes is mentioned in Table 1. They add a layer of high-volume, job-linked pathways that complement higher education by enabling transitions to employment, earn-while-learn exposure, and industry-aligned competencies at scale.

Skill Program	Nodal Agency	Type of Skill / Training Provided	Number of Institutions/ Centres
Craftsmen Training Scheme (CTS)	Directorate General of Training (DGT)	The program provides long-term vocational training for wage employment and self-employment. The programme concentrates on both engineering and non-engineering trades.	14,619 ITIs (Government and Private Industrial Training Institutes; 3,312 are government and 11,243 are private)
Pradhan Mantri Kaushal Vikas Yojana (PMKVY)	Ministry of Skill Development & Entrepreneurship(MSDE) / NSDC	Short-Term Training (STT) and Recognition of Prior Learning (RPL). The programme focuses on providing industry-relevant skills and upskilling opportunities for youth.	14,843 PMKVY Centres
Jan Shikshan Sansthan (JSS)	Directorate of Jan Shikshan Sansthan (DJSS)	The programme provides vocational skills training to individuals who are non-literate, neo-literate, or school dropouts, aged between 15 and 45. It focuses on livelihood promotion for underserved groups.	289 JSS Centres
National Apprenticeship Promotion Scheme (NAPS)	MSDE / National Skill Development Corporation (NSDC)	Apprenticeship Training. Combines basic training with on-the-job training (OJT) at workplaces to provide practical industry exposure.	48,721 Establishments engaged in providing apprenticeship training
Craft Instructor Training Scheme (CITS)	Directorate General of Training (DGT)	Training of Trainers (ToT): specialised training for instructors to teach in ITIs, focusing on hands-on skills and training methodology.	33 National Skill Training Institutes (NSTIs) (Includes 19 NSTIs for Women)
Entrepreneurship Development	NIESBUD / IIE	Entrepreneurship training, mentoring, and consultancy to promote self-employment and small business development.	NIESBUD: 1 Integrated Campus, 1 Regional Centre, 20 State Centres IIE: Regional presence across Northeast India

Table 1: List of Major Skill Programs run by the Government of India
Source: Ministry of Skill Development and Entrepreneurship

3.4 R&D Performing Organisations

R&D-performing organisations are the operational backbone of a national innovation ecosystem. They translate scientific capability into measurable outcomes through research programmes, technology development, product and process innovation, testing and certification, and deployment in priority sectors. This section maps the spread of India's R&D-performing organisations across four major layers: central public R&D centres, state public R&D centres, public sector enterprise (PSE) R&D centres, and private R&D centres. Within the private layer, the analysis further examines key subsystems, such as industrial R&D, global capability centre (GCC) R&D, and MSME-led innovation to capture both formal R&D capacity and emerging innovation activity. The objective is to present a structured view of where R&D is being performed and how capacity is distributed across institutional types.

I. Central Public R&D organisation

R&D centres of Core Science Ministries and Departments

According to the NSTMIS (DST) Directory of R&D Institutions Report 2025, central public R&D institutions under the "major scientific agencies" grouping are mapped across the following core science ministries, departments, and agencies: Defence Research and Development Organisation (DRDO); Department of Atomic Energy (DAE); Department of Space (DOS); Indian Council of Agricultural Research (ICAR); Indian Council of Medical Research (ICMR); Ministry of Electronics and Information Technology (MeitY); Ministry of Earth Sciences (MoES); Ministry of Environment, Forest and Climate Change (MoEFCC); Ministry of New and Renewable Energy (MNRE); and the Ministry of Science and Technology (MST), reflected through its principal arms, such as the Council of Scientific and Industrial Research (CSIR), Department of Biotechnology (DBT), and Department of Science and Technology (DST) [38].

The core science group of ministries and departments accounts for 341 central public R&D centres. The distribution is anchored by ICAR, which has over 102 R&D centres across different Indian

[38] National Science and Technology Management Information System, Department of Science and Technology, Government of India, *Directory of R&D Institutions 2025*, 13th ed., New Delhi, India: Department of Science and Technology, 2025. [Online]. Available: https://www.nstmis-dst.org/Pdfs/RD%20Directory%202025_final_26-02-2025.pdf.

states. It reflects an extensive national agricultural research and field-station network. It is followed by CSIR (37) and DRDO (36), which together indicate substantial central capacity in strategic and industrial research. ICMR, which focuses on health research, has over 31 R&D centres across India. In addition, there is also a significant presence of institutions in mission and enabling domains, that is, areas that provide cross-cutting national capabilities and public-good functions such as environmental monitoring and regulation, digital and electronics enablement, S&T funding and infrastructure, and space-based applications. In this set, MoEFCC has 25 R&D centres, MeitY has 22, DST has 21, and DOS has 19. DAE and DBT have 16 centres each, while MoES has 10 and MNRE has 5. It reflects more specialised institutional footprints in earth systems science and renewable energy.

Fig 11. R&D centres of Core Science Ministries and Departments

Scan QR to access the Annexure 2

The state-wise distribution indicates both clustering and broad geographic coverage. Delhi and Maharashtra host the highest number of centres, with 41 centres each. The next set of major locations includes Karnataka (35), Uttar Pradesh (27), Telangana (25), and Tamil Nadu (22). A second tier of states also shows a meaningful presence, including Uttarakhand (20), West Bengal (19), and Kerala (18). The distribution indicates that central public R&D capacity is anchored in key hubs while remaining spread across multiple regional clusters beyond the National Capital Region. The detailed state-wise distribution is provided in Annexure 2.

R&D Centres of Other Central Govt. Ministries and Departments

The second group covers R&D centres located within other central government line ministries and departments. These are ministries where R&D functions are embedded to support sector-specific mandates, including regulation, service delivery, and mission implementation. In the classification used for this report, the group includes nine principal ministries: Agriculture and Farmers Welfare; Ayush; Chemicals and Fertilisers; Commerce and Industry; Fisheries, Animal Husbandry and Dairying; Health and Family Welfare; Petroleum and Natural Gas; and Textiles. It also includes an "Others" category for additional ministries with smaller institutional counts.

Scan QR to access the Annexure 3

This group comprises 266 central public R&D centres. The largest share is under the Ministry of Ayush, which accounts for 98 centres. It indicates a substantial institutional base for traditional medicinal research within its research and knowledge system. The "Others" category accounts for 51 institutions, reflecting the wide dispersion of R&D activity across multiple ministries outside the major scientific agencies. Among the remaining large contributors, Health and Family Welfare accounts for 29 centres and Fisheries, Animal Husbandry and Dairying for 26, indicating a strong sectoral research presence. Textiles account for 18 centres and petroleum and natural gas for 11, while the remaining ministries contribute smaller but material institutional bases.

At the state level, Delhi hosts the highest number of centres (32), followed by Tamil Nadu (26) and Maharashtra (25). Uttar Pradesh (23) and West Bengal (22) also show a strong presence. Additional concentrations are observed in Karnataka (19) and Telangana (11). The detailed state-wise distribution is provided in Annexure 3.

Public Sector Enterprises R&D centres

Scan QR to access the Annexure 4

The third group covers in-house R&D units of Central Public Sector Enterprises (CPSEs). In the NSTMIS Report, these units are classified under their administrative parent ministry or department, i.e., the ministry/department that exercises ownership, oversight, and governance over the CPSE. There are 117 CPSE in-house R&D units in India. These units represent “R&D in production systems". They are designed to support applied research, product and process development, testing and validation, indigenisation, and scale-up in mission-critical industrial domains.

Institutionally, CPSE R&D spans over 20 line ministries. It represents the scale and diversity of India’s public-sector industrial and technological base. This footprint is particularly visible in sectors where applied R&D supports national capability and industrial performance, including defence production, energy systems, petroleum and refining, mining and materials, heavy engineering, transport and logistics, and strategic manufacturing. Illustrative examples include in-house R&D centres and units within Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Indian Oil Corporation Limited (R&D Centre), and Steel Authority of India Limited (SAIL). The detailed state-wise and ministry-wise distribution is provided in Annexure 4.

II. State Public R&D centres

State Govt R&D Institutions and centres

Beyond the central government system, state governments also maintain R&D capacity through state departments, state-funded research bodies, and state universities. As per the NSTMIS report, within each state, centres are presented in the following order: agricultural universities, research stations, and state government R&D institutions, with state public sector industries listed separately. This reflects the role of states in supporting applied research and problem-solving to advance state priorities, such as agriculture and allied sectors, public health, water and environment, industrial development, and technology deployment, through their mandates, budgets, and institutional arrangements.

There are 1,048 R&D institutions in the state sector in India. Gujarat has the highest number of R&D centres, at 138, followed by Karnataka with 133, Maharashtra with 104, Tamil Nadu with 96,

and Kerala with 73. Together, these five states account for about 52% of the State Sector R&D Institutions [39]. Andhra Pradesh is the next largest contributor, with 67 centres. The distribution indicates both scale and geographic reach. State-sector R&D institutions are present across many states, with the largest concentrations in states that also host strong higher-education and industrial ecosystems.

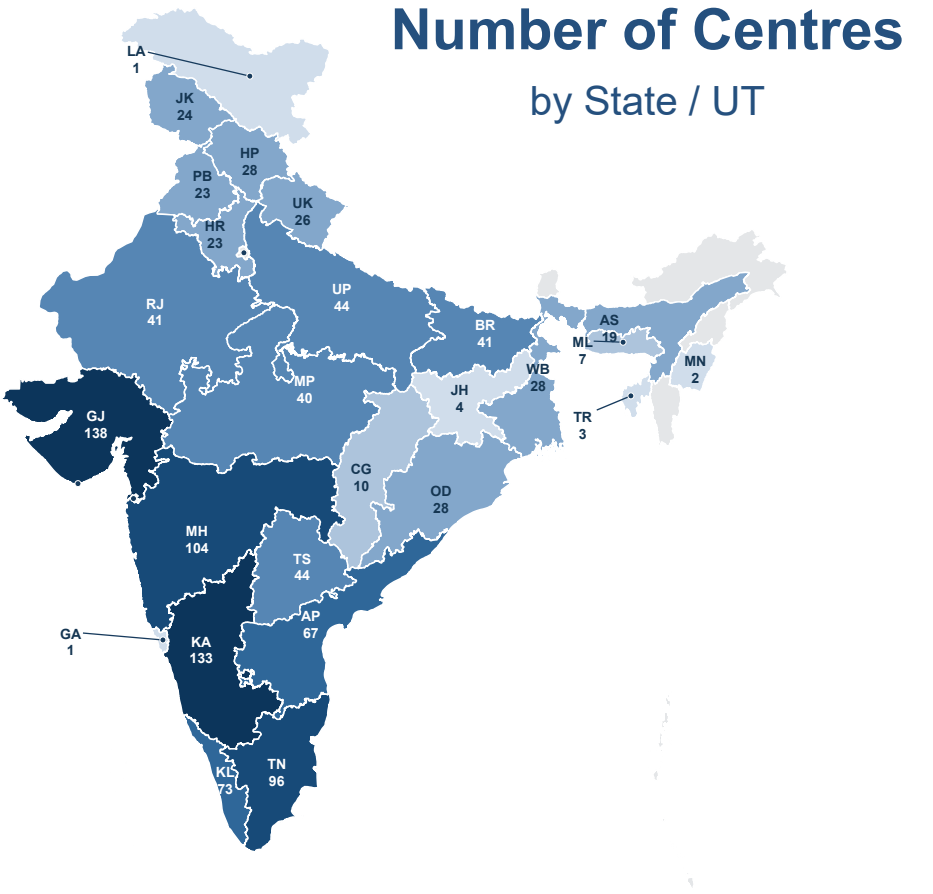


Fig 12. State Govt R&D Institutions and centres

A key enabling mechanism for Indian states is the network of State Science & Technology Councils, which function as nodal platforms for Centre–State S&T cooperation, state-level STI planning, and translation of research into field-ready solutions. These councils strengthen state STI ecosystems, including technology demonstration, partnerships, human resource development, and innovation support. The state science S&T programme supports 28

[39] National Science and Technology Management Information System, Department of Science and Technology, Government of India, *Directory of R&D Institutions 2025*, 13th ed., New Delhi, India: Department of Science and Technology, 2025. [Online]. Available: https://www.nstmis-dst.org/Pdfs/RD%20Directory%202025_final_26-02-2025.pdf.

states and 3 UT councils in developing scientific and administrative human resources, 23 Patent Information Centres, and 113 new projects that address state-specific challenges [40].

Scan QR to access the Annexure 5

As per the Department of Science & Technology (DST) list, State S&T Councils/nodal departments are present across 29 states and 7 union territories. Most states operate through a dedicated State S&T Council/Commission (for example, the Gujarat Council on Science & Technology, the Karnataka State Council for Science & Technology, the Kerala State Council for Science, Technology and Environment, and Maharashtra's Rajiv Gandhi S&T Commission). Several Union Territories are covered through either a UT S&T council or a nodal department (for example, the Andaman & Nicobar S&T Council, the Department of Science & Technology, Chandigarh, and the Puducherry Council for Science & Technology). The detailed state-wise table used for this report is provided in Annexure 5.

State Public Sector Enterprise

In addition to Central Public Sector Enterprises, there are also State Public Sector industries. As per the NSTIMS report, there are 37 state public-sector R&D institutions in India across 12 states. The distribution is concentrated in a few mature state industrial ecosystems. Kerala has 8 public sector R&D institutions. Gujarat, Karnataka, and Tamil Nadu record 5 each. These four states contribute 23 of the 37 units. The next tier comprises Haryana and West Bengal with 3 each, followed by Maharashtra and Uttar Pradesh with 2 each. The remaining states, such as Andhra Pradesh, Himachal Pradesh, Madhya Pradesh, and Rajasthan, each have 1 institution. This indicates that state-owned industrial R&D presence is selective but geographically distributed.

State public sector R&D units serve applied and mission-linked needs, quality and standards, plant and equipment optimisation, and incremental technology absorption in sectors that are important to state development priorities. Examples include electronics, energy, and industrial manufacturing units such as Andhra Pradesh Heavy Machinery & Engg Limited, Haryana Power Generation Corporation Limited, Hutti Gold Mines Co. Limited, Keltron Component Complex Limited, Electronics Corporation of

[40] Department of Science and Technology, Ministry of Science and Technology, Government of India, "State Science & Technology Programme," Department of Science and Technology, 2026. [Online]. Available: https://dst.gov.in/state-science-technology-programme . [Accessed: Feb. 14, 2026]

Tamil Nadu Ltd., and West Bengal State Electricity Distribution Company Limited. These units complement the broader state sector. R&D base by embedding technical and research capability within state-owned production and service enterprises. (See Annexure 6 for the full state-wise table and enterprise list.)

III. Private R&D centres

According to the NSTMIS Report 2025, private-sector R&D centres constitute the largest layer in India's R&D-performing ecosystem. It shows that India has more than 5,300 private-sector R&D institutions out of 8,252 R&D institutions covered across all streams. It implies that nearly two-thirds of the mapped R&D landscape falls under private and non-governmental systems.

DSIR R&D Centres

The private-sector R&D organisation can be structured into four streams. First is DSIR-registered in-house R&D units, which form the largest stream with 2,061 centres [41]. These are corporate R&D centres that have obtained recognition under DSIR's scheme for in-house R&D units established by corporate industry, which is also used as a qualifying benchmark for accessing several government R&D incentives and, in many cases, as an eligibility condition for R&D funding from public agencies. Examples include Abbott Healthcare Pvt. Ltd., Bayer Bioscience Pvt. Ltd., Bio-Pharma Laboratories Pvt. Ltd., and Eicher Motors Limited.

Scan QR to access the Annexure 6

SIRO R&D Centres

Second are the Scientific and Industrial Research Organisations (SIROs), recognised organisations that account for over 750 centres across India. SIRO recognition is designed for non-commercial, research-oriented organisations such as registered societies/trusts and Section 8 (erstwhile Section 25) companies under the Companies Act to strengthen voluntary and non-profit R&D capacity and support research infrastructure development [42]. Atal Incubation Centre – CCMB (AIC-CCMB), the Centre for Brain

[41] [3] Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, "Recognition of In-House R&D Units (RDI)," Department of Scientific and Industrial Research, 2026. [Online]. Available: https://www.dsir.gov.in/offerings/schemes-and-services/details/recognition-of-in-house-rd-units-rdi-AjM0ETMtQWa . [Accessed: Feb. 14, 2026].

[42] Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India, "R&D Analysis of Scientific and Industrial Research Organizations (SIROs): A Study Report," Department of Scientific and Industrial Research, New Delhi, India, 2019. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3d860edd1dd83b36f02ce52bde626c653/uploads/2020/04/2020042215.pdf . [Accessed: Feb. 16, 2026].

Research (SID Complex, IISc), and the Centre for Cellular and Molecular Biology (CCMB) are among the SIROs.

MNCs and GCCs

India's private R&D landscape also includes 1,686 multinational corporation (MNC) R&D units and 895 additional potential R&D units [43], alongside a fast-growing base of around 1700 Global Capability Centres (GCCs) delivering product engineering, analytics and AI-enabled functions for multinational enterprises [44]. The country-of-origin and sector-focus details of India's GCC with related international co-investment trends are detailed in “Chapter 5, Section 5.3 (IV. International Firms in India).

In terms of the geographical distribution of private-sector research and development, Maharashtra has over 1,300 private-sector R&D institutions, or about 26 per cent of the national private sector. This is followed by Tamil Nadu with 563, Telangana with 512, Karnataka with 506, and Gujarat with 484. These five states contribute about 64 per cent of all private-sector R&D institutions. There is also a strong presence in Delhi, with 408, and in Haryana, with 344. It reflects the combined effect of corporate headquarters, industrial corridors, and R&D-intensive services ecosystems.

[43] National Science and Technology Management Information System, Department of Science and Technology, Government of India, *Directory of R&D Institutions 2025*, 13th ed., New Delhi, India: Department of Science and Technology, 2025. [Online]. Available: https://www.nstmis-dst.org/Pdfs/RD%20Directory%202025_final_26-02-2025.pdf.

[44] Press Information Bureau, Government of India, "From Policy to Prosperity: GCCs Leading India's Growth Journey," Ministry of Information and Broadcasting, Dec. 11, 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2202046&lang=1&reg=3.

3.5 Innovation Enablers

In this section, innovation enablers are defined as the institutions, infrastructure, and financial instruments that reduce the cost and risk of moving from ideas and research outputs to products and scalable enterprises. This section reviews key enablers in the current Indian ecosystem, such as established incubators and accelerators, research parks, and translational hubs, with a focus on how these mechanisms strengthen the Indian S&T and innovation system by improving the conversion of knowledge into solutions.

I. Incubators and Accelerators in the Indian Innovation Ecosystem

Incubators provide structured support to early-stage innovators and startups by offering shared workspace and facilities, technical and business mentoring, IP/legal guidance, and linkages to markets and finance. One of the public incubation initiatives in India is DST's NIDHI–Technology Business Incubators (NIDHI-TBI) programme. Under this, TBIs are positioned as enabling platforms for technology/knowledge-based startups, with objectives that include speedy commercialisation of technologies and building networks among academia, financial institutions, industry, and other institutions [45]. Similarly, Startup India emphasises incubators as a vital resource for startup growth because they provide infrastructure, mentorship, and financial support, and it highlights the need to strengthen the capacity of existing incubators and support the creation of new ones [46].

In addition to DST-NIDHI, major government initiatives that strengthen the incubation ecosystem in India include the Atal Innovation Mission's Atal Incubation Centres (AICs), which support world-class incubation infrastructure, mentoring, and access to seed capital [47]; MeitY's TIDE 2.0, which aims to build a holistic ecosystem for technology startups and incubation centres [48]; and

[45] Department of Science and Technology, Government of India, "NIDHI – Technology Business Incubators (NIDHI – TBI)," National Initiative for Developing and Harnessing Innovations, Jan. 23, 2026. [Online]. Available: https://nidhi.dst.gov.in/nidhitbi/

[46] Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India, "Incubator Schemes," Startup India, Jan. 23, 2026. [Online]. Available: https://www.startupindia.gov.in/content/sih/en/incubator-schemes.html .

[47] Atal Innovation Mission, NITI Aayog, Government of India, "Atal Incubation Centres," Atal Innovation Mission, Jan. 3, 2024. [Online]. Available: https://aim.gov.in/atal-incubation-centres.php.

[48] MeitY Startup Hub, Digital India Corporation, Ministry of Electronics and Information Technology, Government of India, "Technology Incubation and Development of Entrepreneurs (TIDE 2.0)," MeitY Startup Hub, Feb. 24, 2026. [Online]. Available: https://msh.meity.gov.in/schemes/tide .

DBT-BIRAC's BioNEST, which supports establishing bio-incubators and provides access to infrastructure and mentoring for biotech entrepreneurship [49].

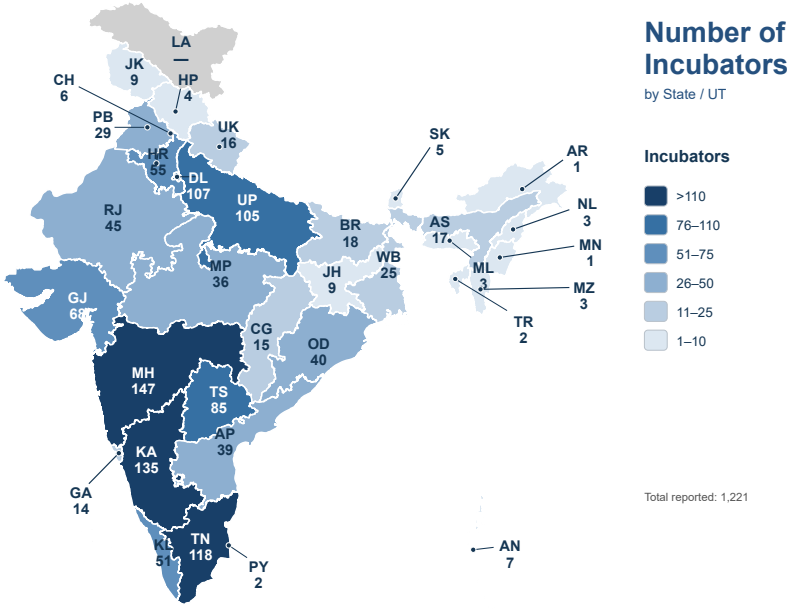


Fig 13. State/UT-Wise Incubator Distribution in India

Source: DPIIT Startup India, Ministry of Commerce and Industry, Govt. Of India.

Accessed on Feb. 15, 2026.

As per the DPIIT Startup India, the country has 1,221 incubators and 202 accelerators across the Indian states/UTs. The data indicate that the incubator landscape is highly concentrated within a leading ecosystem. The top five states, Maharashtra (147), Karnataka (135), Tamil Nadu (118), Delhi (107), and Uttar Pradesh (105), together account for 612 incubators, representing about half, over 50 per cent, of the total captured in the map below. This concentration extends beyond the top tier: the top ten states account for 916 incubators, or approximately three-fourths, over 75, indicating a strong clustering of incubation capacity around the country's principal innovation and startup hubs. The detailed list of state-wise incubators is mentioned in Annexure 7.

Scan QR to access the Annexure 7

The accelerator ecosystem is even more concentrated, consistent with the location of scale-up programmes in the most mature startup markets. As shown in the map below (fig. 14), the top five states, such as Karnataka (42), Maharashtra (41), Delhi (37),

[49] Biotechnology Industry Research Assistance Council, Department of Biotechnology, Government of India, "Bioincubators Nurturing Entrepreneurship for Scaling Technologies (Bio-NEST)," BIRAC, Feb. 18, 2026. [Online]. Available: https://birac.nic.in/bionest.php.

Haryana (22), and Telangana (20), account for 162 accelerators, i.e., about four-fifths, or 80.2%, of the total.

The top three states alone, Karnataka, Maharashtra, and Delhi, account for 120 accelerators, or nearly three-fifths (59.4%), reinforcing that accelerator density is highest where the startup pipeline, investor networks, and market access are strongest. This spatial concentration is consistent with official assessments that innovation outcomes and entrepreneurship remain clustered in a small number of metropolitan regions and their adjacent corridors.

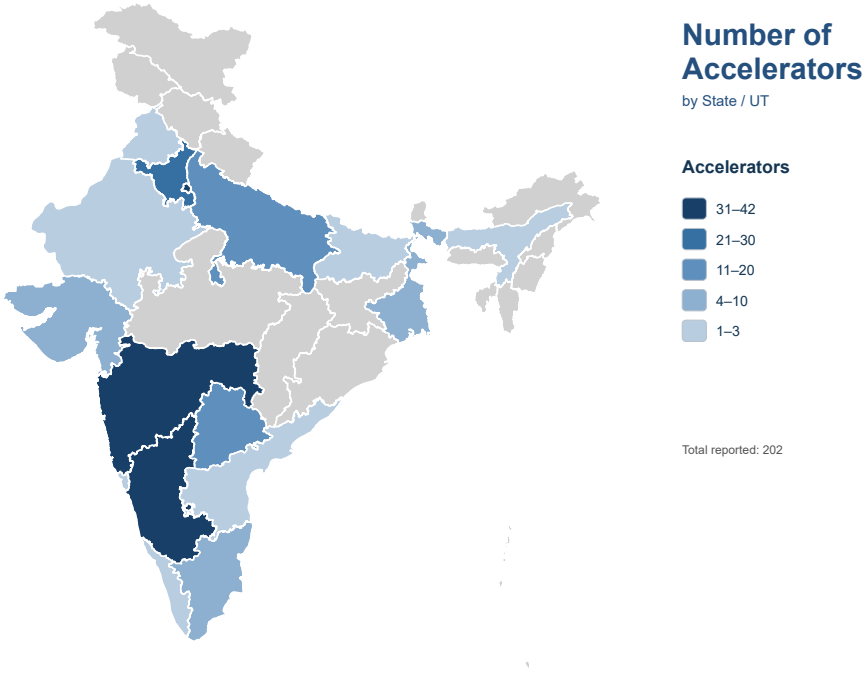


Fig 14. State/UT-Wise Accelerators Distribution in India

Source: DPIIT Startup India, Ministry of Commerce and Industry, Govt. Of India. *Accessed on Feb. 16, 2026.*

The Economic Survey 2025–26 notes that Bengaluru, Delhi, and Mumbai feature among the world's top 50 innovation-intensive clusters. The detailed list of state-wise accelerators is mentioned in Annexure 8 [50].

Scan QR to access the Annexure 8

[50] Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India, "Digital Maps," Startup India, Jan. 31, 2026. [Online]. Available: https://www.startupindia.gov.in/digital-map/maps [Accessed: Sep. 22, 2026].

Sectoral Orientation and Domains

Incubators and accelerators are structured around sector-focused programmes that respond to national missions, industry demand, and emerging technology frontiers. Accordingly, India's incubation and acceleration landscape now supports a broad range of domains, including AI and robotics, nanotechnology, aeronautics/aerospace and defence, AR/VR, chemicals, design, renewable and non-renewable energy, green technologies, technology hardware, healthcare and life sciences, waste management, and other deep-tech and applied innovation areas. This sectoral breadth is reflected in major public ecosystem platforms. The Atal Innovation Mission (AIM) incubation ecosystem supports startups across multiple technology areas and tracks measurable outcomes such as the number of startups incubated and jobs created [51]. Similarly, MeitY's TIDE 2.0 is promoting tech entrepreneurship by providing financial and technical support to incubators that support ICT startups primarily engaged in emerging technologies such as IoT, AI, blockchain, and robotics [52].

Sector-specific incubation models are also well established in strategically important areas. For example, in life sciences and biotechnology, DBT-BIRAC's BioNEST supports a national network of bio-incubators to strengthen biotech entrepreneurship by enabling access to specialised infrastructure and mentoring [53].

II. Research Park

Research parks are institutional platforms that co-locate industry, startups, and research groups around a host academic/research institution to accelerate translation of research into deployable technologies. Their purpose is to reduce the gap between laboratory outputs and market adoption by enabling industry–academia collaboration, shared R&D and prototyping facilities, testbeds and validation support, and structured pathways for commercialisation and industry engagement. This approach is widely recognised as strengthening India's innovation system by

[51] Atal Innovation Mission, NITI Aayog, Government of India, "Atal Incubation Centres," Atal Innovation Mission, Jan. 3, 2024. [Online]. Available: https://aim.gov.in/atal-incubation-centres.php.

[52] MeitY Startup Hub, Digital India Corporation, Ministry of Electronics and Information Technology, Government of India, "Technology Incubation and Development of Entrepreneurs (TIDE 2.0)," MeitY Startup Hub, Feb. 24, 2026. [Online]. Available: https://msh.meity.gov.in/schemes/tide .

[53] Biotechnology Industry Research Assistance Council, Department of Biotechnology, Government of India, "Bioincubators Nurturing Entrepreneurship for Scaling Technologies (Bio-NEST)," BIRAC, Feb. 18, 2026. [Online]. Available: https://birac.nic.in/bionest.php

creating physical proximity and sustained collaboration between researchers and industry.

Institutional Model and Programs

Research parks and translational hubs in India operate under multiple administrative umbrellas, depending on their mandates and host institutions. Key national and institutional channels include:

a) NM-ICPS (DST): TIHs and Technology Translation Research Parks (TTRPs)

Under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), DST has established 25 Technology Innovation Hubs (TIHs) at premier institutions to build technology platforms spanning the full lifecycle from knowledge generation to translation and commercialisation [54]. Further, four TIHs, at IIT Kanpur, IISc Bengaluru, IIT(ISM) Dhanbad, and IIT Indore, have been upgraded to Technology Translation Research Parks (TTRPs) to significantly scale translational research, commercialisation, and industry engagement [55].

Fig 15. Technology Innovation Hubs (TIHs) under NM-ICPS

Source: NM-ICPS, DST.

25 innovation hubs across 18 states and UTs

Navavishkar IIT Tirupati Andhra Pradesh	**IITG TIDF** IIT Guwahati Assam	**Vishlesan I-Hub** IIT Patna Bihar	**IBITF** IIT Bhilai Chhattisgarh	**IHub Anubhuti** IIIT Delhi Delhi
IHFC (Cobotics) IIT Delhi Delhi	**IIT Mandi iHub** IIT Mandi Himachal Pradesh	**TEXMiN** IIT (ISM) Dhanbad Jharkhand	**I-HUB for Robotics** IISc Bengaluru Karnataka	**IIITB COMET** IIIT Bengaluru Karnataka
IPTIF IIT Palakkad Kerala	**IITI Drishti CPS** IIT Indore Madhya Pradesh	**I-Hub Quantum** IISER Pune Maharashtra	**TIH-IoT** IIT Bombay Maharashtra	**AWaDH** IIT Ropar Punjab
BITS BioCyTiH BITS Pilani Rajasthan	**TIH Drishti** IIT Jodhpur Rajasthan	**IITM Pravartak** IIT Madras Tamil Nadu	**IHub-Data** IIIT Hyderabad Telangana	**TiHAN** IIT Hyderabad Telangana
C3iHub IIT Kanpur Uttar Pradesh	**I-DAPT-HUB** IIT BHU Varanasi Uttar Pradesh	**DivyaSampark** IIT Roorkee Uttarakhand	**IDEAS** ISI Kolkata West Bengal	**AI4ICPS** IIT Kharagpur West Bengal

[54] Department of Science and Technology, Government of India, "National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS): Technology Innovation Hubs," Department of Science and Technology, Apr. 28, 2025. [Online]. Available: https://nmicps.gov.in/tih.

[55] Press Information Bureau, Government of India, "Parliament Question: Progress Under NM-ICPS," Ministry of Science and Technology, Feb. 5, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2223739&lang=1&reg=6.

The aim of these hubs is to strengthen India's capabilities in cutting-edge cyber-physical technologies such as Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT) & Internet of Everything (IoE), Data analytics, Robotics and Autonomous Systems, Cybersecurity, Quantum Technologies, etc

b) Software Technology Parks of India (STPI), MeitY:

STPI is a national network under MeitY that provides infrastructure and ecosystem services that support the IT/ITeS and emerging technology innovation pipeline, including incubation and specialised centres. STPI's distributed footprint is explicitly positioned to extend the technology ecosystem beyond major cities. There are 68 STPIs, of which 60 are in Tier-II/III locations of the country. It is engaged in promoting IT/ITES Industry, innovation, R&D, start-ups, product/IP creation in the field of emerging technologies like IoT, Blockchain, Artificial Intelligence (AI), Machine Learning (ML), Computer Vision, Robotics, Robotics Process Automation (RPA), Augmented & Virtual Reality, Animation & Visual effect, Data Science & Analytics for various domains like Gaming, FinTech, Agritech, MedTech, Autonomous Connected Electric & Shared(ACES) Mobility, ESDM, Cyber Security, Industry 4.0, Drone, Efficiency Augmentation, etc.

Over the last five years, STPI has established 9 new incubation centres and 15 new Centres of Entrepreneurship (CoEs) (taking the total to 24 CoEs), and has supported 1,121 startups with a total outlay of ₹445.77 crore through MeitY programmes [56].

c) Institution-Led Research Parks:

In addition to the above initiatives, a distinct set of research parks in India is also anchored in major academic and research institutions, particularly the IITs and IISc. These parks leverage the host institution's faculty expertise, laboratories, research infrastructure, students, and intellectual property while providing dedicated space for industry R&D, startups, prototyping, testing, and technology translation. Unlike mission-specific hubs, several of these parks are multi-domain rather than focused on a single technology. Their funding models generally combine initial public capital support with institution-led management and industry participation, including co-location, R&D partnerships, use of facilities, and other revenue-generating activities.

[56] Software Technology Parks of India, Ministry of Electronics and Information Technology, Government of India, "About Software Technology Parks of India (STPI)," STPI, Feb. 25, 2026. [Online]. Available: https://stpi.in/en/about-stpi.

Below are a few research parks operating under different host bodies and governance structures, while serving a common function:

- **IIT Madras Research Park (IITMRP)**: IITMRP is India's first university-based research park and provides the principal model for subsequent institution-linked research parks in the country. It has a broad deep-tech orientation, with specialised Centres of Excellence working across semiconductors, quantum communications, Industry 4.0 and advanced manufacturing, MedTech, cyber-physical systems, battery technologies and electric mobility, telecommunications, water technologies, and decarbonisation, among other areas.

- **IISc – Quantum Research Park (QuRP)**: Hosted within the IISc, QuRP is a specialised institution-led park focused on quantum computing and related quantum technologies, providing an interface between academic research, industry, startups, and technology translation. Unlike the broader multi-domain research parks, it has a defined sectoral orientation around quantum technologies. The park is supported by the Karnataka Innovation and Technology Society (KITS), Government of Karnataka and administered alongside the FSID.

- **IIT Bombay – Research Park (ASPIRE)**: ASPIRE provides a platform for industry R&D centres to co-locate within the IIT Bombay ecosystem and engage with faculty, research infrastructure, startups, and students. It is engaged in multi-domain work, with thematic areas covering healthcare and life sciences; semiconductors, electronics hardware, and quantum technologies; AI, data science, cybersecurity, and digital systems; chemicals, materials, and advanced manufacturing; sustainability and energy; and future transportation and mobility. The Research Park was approved with government support as part of the national programme to establish a research park modelled on IIT Madras.

- **IIT Kharagpur – Research Park**: It is designed as a multidisciplinary industry–academia platform and includes dedicated prototype laboratories for electronics, mechanical engineering, and biosciences, alongside facilities for collaborative R&D, technology-driven startups, and product development.

- **IIT Delhi – Research & Innovation Park / R&I Park**: Managed through IIT Delhi's Foundation for Innovation and Technology Transfer (FITT), it is oriented towards research translation, advanced technology development, deep-tech entrepreneurship and product development rather than a single technology vertical. It enables interaction among IIT Delhi researchers, industry, entrepreneurs, and government agencies and provides facilities, including infrastructure that supports electronics system design and manufacturing.

- **IIT Kanpur – Research & Technology Park (Technopark@IITK)**: It is a Section 8 entity designed to deepen industry–academia R&D collaborations, with campus-based infrastructure for co-location and partnership building. It supports R&D across industrial sectors, allowing companies to access IIT Kanpur's research expertise, laboratories, and technology development capabilities.

- **IIT Guwahati – Research Park**: It is anchored in IIT Guwahati and is intended to strengthen technology-based innovation and industry-linked R&D, particularly by enabling companies and SMEs to work with the Institute on technology development and upgradation. Its mandate is broad rather than technology-specific, while its location gives it an additional role in strengthening innovation and industry engagement in the Northeast.

- **IIT Hyderabad – Technology Research Park (TRP)**: It is designed for the co-location of industry R&D/technology development centres, funded by the Ministry of Education with capital support and administered as an independent Section 8 company to strengthen industry–academia translation.

- **IIT Gandhinagar – Research Park**: It provides companies and startups access to IIT Gandhinagar's laboratories, research infrastructure, faculty expertise, prototyping and testing facilities and technology-transfer mechanisms. It operates as a multi-domain research and translation platform. Its broader institutional ecosystem currently includes capabilities in advanced materials, clean energy, healthcare and MedTech, AI-enabled technologies, and semiconductor-related research infrastructure.

III. Non-University Innovation Hubs and Technology Clusters

Apart from the mission-based, network-based, and institution-led initiatives discussed above, India also has a set of innovation platforms that operate outside the structure of a host university or research institution. These may be understood as independently governed innovation hubs, science parks, and technology clusters. They are generally established by state governments, public–private partnerships, not-for-profit entities, or other autonomous organisations, and bring together startups, industry, and investors within a common ecosystem. They provide incubation space, access to finance, prototyping and testing infrastructure, specialised laboratories, regulatory support, manufacturing facilities, corporate customers, and domestic and international markets. Their funding structures also vary. Some rely primarily on public investment in infrastructure, while others combine government support with corporate partnerships, grants, investment funds, and private capital. The following are some examples:

T-Hub, Hyderabad: It is a Section 8 not-for-profit organisation operating through a public–private partnership model, bringing together government, industry, and academia without being hosted by a university. Its startup-financing ecosystem combines Central and State government funding and connections to venture capital and angel investors. It hosts the DST-supported MATH Centre of Excellence for AI and ML and India's first Google for Startups Hub, which specifically supports AI-first startups through technical mentoring, workspace, and access to Google and T-Hub networks.

Andhra Pradesh MedTech Zone (AMTZ), Visakhapatnam: AMTZ is a model in which innovation, incubation, testing, and manufacturing are integrated within a specialised industrial technology cluster. Its model combines publicly enabled infrastructure with leased manufacturing units and common manufacturing and scientific facilities. Within AMTZ, the Bio Valley Incubation Council (BVIC) operates as a BIRAC-funded BioNEST incubator, providing an additional program-based financing and incubation layer for MedTech and biotechnology startups. The technology base is specialised around medical devices and diagnostics, including biomaterials, 3D printing and bioprinting, EMI/EMC and MRI superconducting magnets, gamma irradiation, and testing and calibration

IKP Knowledge Park, Hyderabad and Bengaluru: IKP is an independently operated science park and incubator, with its principal science park at Genome Valley, Hyderabad, and IKP EDEN, its engineering and hardware makerspace in Bengaluru. Its technology focus covers biopharma and biotechnology, health technologies and medical devices, agri-tech, and engineering and hardware. Its financing model combines BIRAC's Biotechnology Ignition Grant (BIG), philanthropy-backed programs such as BFI NAMAH, funded by Blockchain for Impact for MedTech translation, and its newer IKP ARK venture-building provides operational and commercialisation support in return for milestone-linked equity.

Bangalore Bioinnovation Centre (BBC), Bengaluru: BBC is a Government of Karnataka and DBT. They focus on health technology, agri-tech, food technology, climate technology, and Industry 5.0, with particular emphasis on the commercialisation of biotechnology and life sciences. It is a publicly supported infrastructure with access to Central and State government grant programs and private investment networks. The centre provides shared laboratory infrastructure, advanced research equipment, contract research, IP support, acceleration, and co-manufacturing facilities for scaling biotechnology products.

As observed in the sections above, India's innovation-enabling ecosystem is supported by both institutional and non-institutional mechanisms, each addressing different stages of technology development, translation, and commercialisation. These mechanisms are further sustained by diverse sources of financing, including public funding, public–private partnerships, private investment, and philanthropic support, enabling innovators to access research infrastructure, incubation, testing, industry networks, and pathways to market. The ecosystem can broadly be characterised as:

- **Mission- and program-led**: Government-supported initiatives such as NM-ICPS Technology Innovation Hubs (TIHs) and Technology Translation Research Parks (TTRPs), STPI Centres of Entrepreneurship, NIDHI-TBIs, TIDE 2.0, and BioNEST provide public funding and infrastructure support for technology development and commercialisation.

- **Institution-led innovation ecosystem**: Research parks anchored in major academic and research institutions, such as

IIT Madras Research Park, IIT Bombay ASPIRE, IIT Kanpur Technopark, and IISc's Quantum Research Park, leverage institutional research capabilities, laboratories, and industry partnerships to support translational R&D, product development, and technology transfer.

- **Non-university innovation platforms and technology clusters:** Independently governed platforms such as T-Hub, AMTZ, IKP Knowledge Park, provide incubation, specialised infrastructure, prototyping and testing facilities, manufacturing support, investor connections, and market access.

- **Diverse financing mechanisms**: Innovation enablers draw on multiple sources of finance, including public grants and capital support, public–private partnership models, corporate participation, venture capital, angel investment, and philanthropic funding. For example, institution-led research parks receive significant public support; T-Hub connects startups with venture and angel investors; and IKP Knowledge Park combines government programs, private investment, and philanthropic funding.

3.6 India’s Industrial Ecosystem

The industrial ecosystem in India has grown to become a globally significant hub for technology, manufacturing and investment capital. The ecosystem encompasses large technology corporations, multinational enterprises, a rapidly expanding startup sector and the Micro, Small and Medium Enterprise (MSME) base that forms the backbone of India's economy.

This section focuses on the industrial ecosystem in India with an emphasis on:

- The startup sector in India
- Private investments in India from 2015 to 2024
- India’s Micro, Small and Medium Enterprise (MSME) sector
- The technology sector in India

I. The startup sector in India

The Indian startup ecosystem is a testament to India’s economic progress, demonstrating exponential growth and sectoral diversification. Currently comprising over 2 lakh recognised entities, the startup landscape reflects the growing innovation and entrepreneurship ecosystem in India and its influence on the wider economy. This section provides an overview of the ecosystem - the prevailing trends and the current landscape that have positioned India as a leading global hub for startup activity and technology development.

For the startup ecosystem, the following ecosystem-level analysis has been carried out:

- **Macro-level understanding of the Indian startup ecosystem**
    - Categorisation of the Indian startup ecosystem - by sector of startups
    - Categorisation of the Indian startup ecosystem - by stage of the startup

- Categorisation of the Indian startup ecosystem - by residential state

- **A look at the deeptech ecosystem in India**

Categorisation of the Indian startup ecosystem - by sector of startup

The top 10 industries collectively represent a broad spectrum of activity, ranging from deep-tech services to core infrastructure and agriculture.

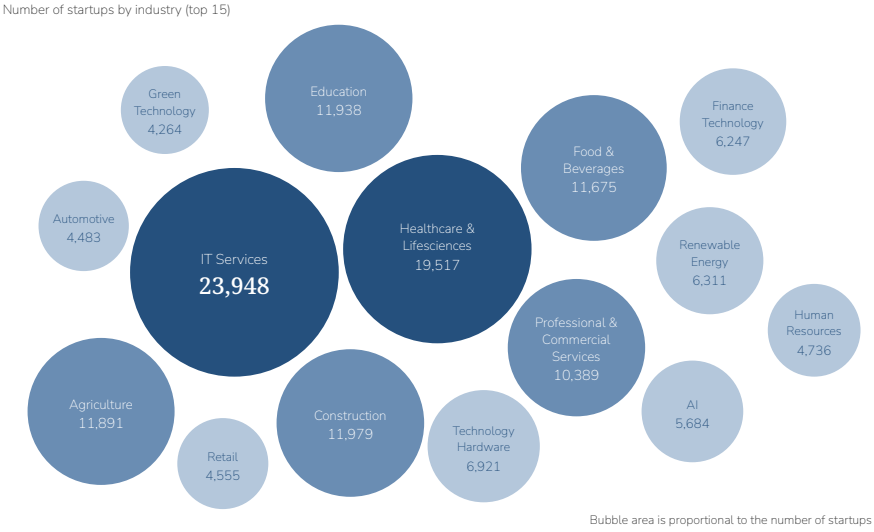


Fig 16. Top 15 Industries - Indian Startups

Source: Startup India.

Date accessed 17/02/2026.

- The ecosystem is anchored by two dominant sectors that collectively account for nearly 30% of the top-tier startup activity - IT and Healthcare & Lifesciences.

- IT Services remains the largest single cohort with around 24,000 startups (16.6%)

- Healthcare & Lifesciences: The second-largest sector, with 20,000 entities (13.5%). The scale of this sector highlights a massive wave of innovation directed at public health, biotechnology, and medical access, likely accelerated by post-pandemic demands.

- The sectoral distribution depicts a mature and balanced ecosystem. The high volumes in Agriculture, Construction, and Healthcare demonstrate that Indian startups are also focusing on local needs for business models.

Categorisation of the Indian startup ecosystem - by stage of the startup

An analysis of India's startups by stage of development - Ideation, Validation, Early Traction, and Scaling highlights that a majority of Indian startups are in the validation stage.

- Validation accounts for the largest share, at around 35%, pointing to a large number of startups actively testing product-market fit and refining their business models.
- Ideation accounts for 30% for startups at the concept and pre-product stage.
- Early Traction accounts for nearly 24% of entities, while 10% are at the scaling stage with demonstrated business models.

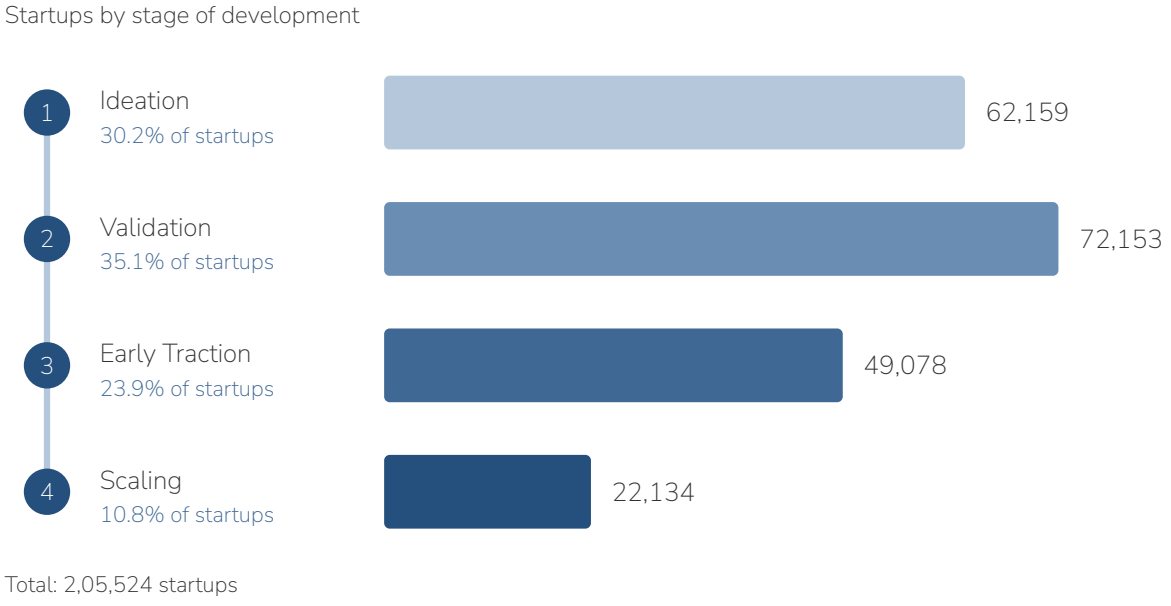


Fig 17. Indian Startups - by stage. **Source**: Startup India. *Date accessed 17/02/2026*

Categorisation of the Indian startup ecosystem - by residential state

An analysis of startups by state reveals that Maharashtra leads by a significant margin, with 35,992 startups attributable to Mumbai's position as the country's financial and consumer technology capital. Karnataka follows with 1,163 startups, leveraging Bengaluru's technology and deep-tech base.

The startup activity is no longer confined to the major metropolitan regions. The presence of registered startups across all 36 states and union territories highlights that entrepreneurship is seen as a viable pathway and the ecosystem conditions are emerging.

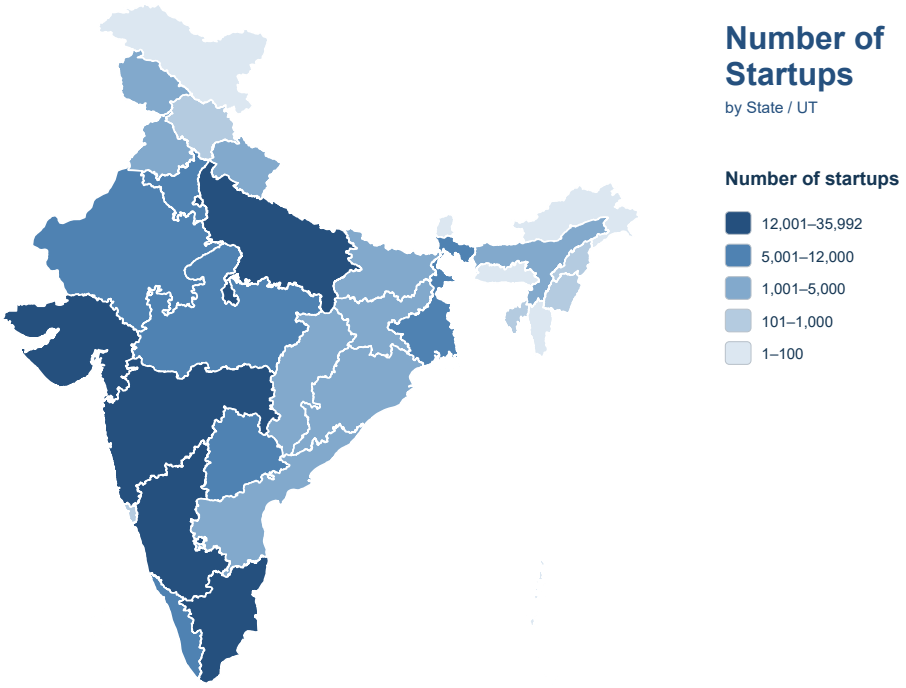


Fig 18. Indian Startups - by residential state

Source: Startup India.

Date accessed 17 Feb, 2026

A look at the deep-technology ecosystem in India

India has become one of the most rapidly growing deep tech startup ecosystems in the world. The deeptech ecosystem in India consists of a wide base of ventures working on frontier domains of science and engineering, across sectors. Currently, more than 10,000 startups are functioning in India in the deeptech space.

Attributes specific to deep tech ventures, as also described by the Draft National DeepTech Startup Policy 2023 (NDTSP) [57] collectively distinguish them from the conventional startups relying on business model innovation. Deeptech startups in India are not only concentrated in metropolitan cities like Bengaluru, Mumbai, Hyderabad and Delhi-NCR, but are also functioning in other clusters around India.

[57] Office of the Principal Scientific Adviser to the Government of India, "National Deep Tech Startup Policy Framework (NDTSP)," Principal Scientific Adviser, Aug. 18, 2026. [Online]. Available: https://www.psa.gov.in/deep-tech-policy. [Accessed: Aug. 19, 2026]

The broader deeptech ecosystem encompasses areas beyond the conventional segregation of technology domains. Some of these deeptech areas include: quantum technologies, space technologies, biotechnology, clean technology, advanced manufacturing, advanced materials, hydrogen and alternative energy technologies, autonomous systems and frontier communication technologies. Combined, these deeptech areas are an indicator of India's position as a global leader in science-based innovation. The broad focus areas of the deep tech ecosystem in India also align with the four pillars as highlighted in the NDTSP - securing India's economic future, progressing towards a knowledge-driven economy, bolstering national capability and sovereignty through the Atmanirbhar Bharat imperative and encouraging ethical innovation.

Sectoral overview of the deeptech startup ecosystem in India

A brief overview of some of the sectors of the deep tech ecosystem is presented below:

Advanced Manufacturing

The advanced manufacturing sector focuses on industrial automation, IoT-enabled process monitoring and related areas. Some of the ventures in this space include Ati Motors, CynLr (Cybernetics Laboratory), Ethereal Machines and Bijnis. These companies are focusing on areas like building autonomous mobile robots for factory material movement, developing AI-based robotic vision platforms that let industrial robotic arms perceive and manipulate unfamiliar objects, manufacturing CNC machines that support both additive and subtractive processes, and digitising unorganised manufacturing supply chains. Ati Motors has a post-money valuation of around $36 million, while CynLr stands at $24 million [58].

Artificial Intelligence

The Artificial Intelligence sector spans natural language processing, computer vision, mixed reality and spatial computing, and AI-enabled analytics. The startups in this domain find applications across the sectors of defence, agriculture, healthcare, and enterprise operations. Some of the ventures in this sector include Sarvam AI, CARPL.ai, Bert Labs, Gnani.ai, and Qure.ai. These startups are working on developing full-stack AI models, mixed-reality headsets for defence, education and enterprise

[58] As per data collected from Tracxn Platform (accessed on 19 August 2026)

training, AI-based microclimate forecasting for precision agriculture, and AI-driven video and audio distribution technology. Sarvam has a post-money valuation of around $1.4 billion, while Bert Labs stands at $93.8 million [59].

Biotechnology

The biotechnology sector in India represents one of the most prominent landscapes in India's deep tech ecosystem - encompassing areas like life sciences, genomics, synthetic biology, biopharmaceuticals, and agri-biotech. Some of the ventures in this sector are ImmunoACT, String Bio, Immuneel, Haystack Analytics, etc. Ventures in this field are working on a wide spectrum of areas like gene-modified CAR-T cell therapies for cancer, biomanufacturing of raw materials for animal nutrition and agri-inputs, regenerative medicine, and cell replacement therapies for incurable eye diseases. ImmunoACT has a post-money valuation of around $99.7 million, while Bert Labs stands at $230 million [60].

CleanTech

The CleanTech sector covers waste management, circular economy solutions, and air and water treatment technologies. Some of the startups in this space include PadCare Labs, Zerocircle, Recity and Devic Earth. Ventures in this space are working on sanitary waste recycling systems, seaweed-based biodegradable alternatives to single-use plastic, urban circular-economy platforms for waste management, and AI-powered air pollution control equipment. PadCare has a post-money valuation of around $13.2 million, while Zerocircle stands at $10.5 million [61].

Quantum Technologies

Quantum technologies hold tremendous disruption potential across domains of finance, logistics, healthcare, etc. The quantum startup ecosystem is segregated across the country, with Karnataka leading (~20% of startups), followed by Maharashtra (~14%), Delhi (~13%), Telangana (~10%), and Uttar Pradesh (~10%). These startups are also emerging in cities like Ahmedabad, Chennai and Hyderabad, highlighting location diversification for R&D capabilities beyond established technology

[59] As per data collected from Tracxn Platform (accessed on 19 August 2026)

[60] As per data collected from Tracxn Platform (accessed on 19 August 2026)

[61] As per data collected from Tracxn Platform (accessed on 19 August 2026)

hubs. In this sector, QNu Labs is working on quantum key distribution (QKD) and quantum random number generation for secure communications, while QpiAI is working on building full-stack quantum computing hardware and artificial intelligence (AI) platforms. QNu Labs has a post-money valuation of around $136 million, while QpiAI stands at $212 million [62].

Semiconductors

The semiconductors sector spans fabless chip design, System-on-Chip (SoC) and ASIC development, RISC-V processor architectures, and compound semiconductor materials. Some of the ventures in this sector are 3rdiTech, InCore Semiconductors, MindGrove Technologies and Agnit Semiconductors. Startups in this space are working across areas like mixed-signal integrated circuits for communications, IoT and automotive applications, RISC-V-based SoCs for edge computing, reduced instruction set semiconductor solutions, and gallium nitride (GaN) substrates for power and RF applications. MindGrove Technologies has a post-money valuation of around $25.1 million, while InCore Semiconductors stands at $20.5 million [63]

Space Technologies

India's SpaceTech ecosystem has grown at a rapid pace following the Indian Space Policy 2023 and the establishment of IN-SPACe. Some of the ventures in this sector are Skyroot Aerospace, Digantara, Bellatrix Aerospace, Dhruva Space, Pixxel, etc. Startups in this space are working across areas like small-payload launch vehicles, customisable and 3D-printed launch vehicle platforms, space situational awareness and object tracking, and end-to-end satellite design, manufacturing and ground support solutions. Skyroot Aerospace has a post-money valuation of $1.11 billion, while Bellatrix Aerospace stands at $ 89 million [64].

India’s deep tech ecosystem presents opportunities for accelerated growth across a variety of sectors. For example, the quantum sector counts upon an established foundational base through the National Quantum Mission. Building on this foundational base, Indian startups in this space are positioning India competitively in quantum cryptography, quantum simulation and other domains of quantum technology. The SpaceTech sector, catalysed by the

[62] As per data collected from Tracxn Platform (accessed on 19 August 2026)

[63] As per data collected from Tracxn Platform (accessed on 19 August 2026)

[64] As per data collected from Tracxn Platform (accessed on 19 August 2026)

Indian Space Policy 2023, has seen the growth of private space companies spanning propulsion, satellite design, and earth observation. Similarly, the convergence of biotechnology with AI is producing novel diagnostic, therapeutic, and agricultural biotechnology solutions with significant export potential.

India's deep tech ecosystem holds significant potential for development of solutions tailored to domestic developmental challenges. Applications in areas such as clean water access, agricultural productivity, climate resilience, and accessible healthcare are a testament to this.

II. Private investments in India from 2016-2025

The data for private investments reveals three phases in India's private investment cycle. The period from 2016 to 2020 saw a consistent growth in both funding and deal volumes. During this time, the total funding rose from USD 39 billion in 2016 to a peak of USD 67.7 billion in 2020.

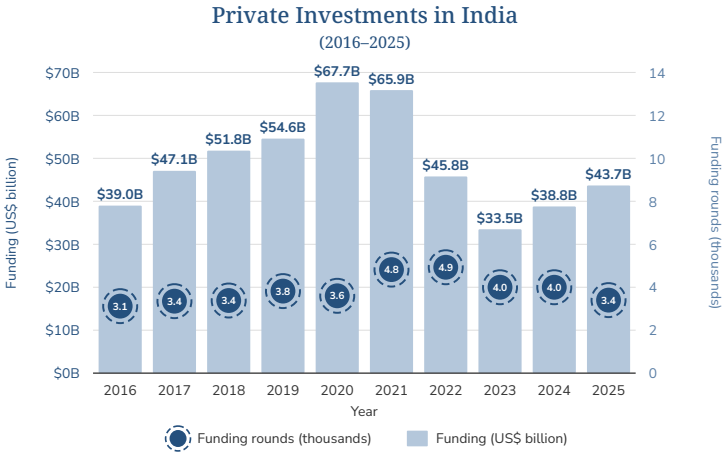


Fig 19. Private Investments in India. **Source**: Tracxn. *Date accessed 10/08/2026*

A divergence between funding value and deal volume:

- 2021 saw deal volumes grow to a record 4,820 rounds, even as total funding moderated slightly to USD 65.9 billion. This may suggest a widening of the investor base and wider deployment of capital across startups.
- 2022 recorded the highest-ever funding rounds of 4,930 rounds. This year saw the funding decline to USD 45.8 billion, a trend consistent with global investment trends.
- 2023 saw the funding further decline to USD 33.5 billion.

Till 2025, investments saw a recovery to USD 43.7 billion (a 30% increase over 2023). It is to be noted that the deal volumes remained nearly consistent throughout the correction phase, never falling below 3,760 rounds. Going forward, India's private investment landscape is well-positioned for a sustained and more diversified recovery through 2026 and beyond.

India's unicorn ecosystem (startups achieving a valuation of USD 1 billion or more) has grown into one of the largest globally. This highlights the depth of the country's domestic digital market. India is now home to 125 unicorns [65]. Globally, India ranks third in total unicorn creation with 125 unicorns, behind the United States (1,121 unicorns) and China (249 unicorns).

- Within India, Bengaluru leads with 53 unicorns. It is followed by Gurugram and Mumbai, each home to 20 unicorns.
- From a sectoral standpoint, the 'consumer' sector has produced the highest number of unicorns at 58. It is followed by Retail (with 39 unicorns) and Enterprise Applications (37 unicorns).

III. India's Micro, Small and Medium Enterprise (MSME) sector

The Micro, Small and Medium Enterprise (MSME) sector constitutes the foundational layer of India's industrial economy. The sector contributes [66] approximately 31% of India's GDP and accounts for over 48% of the country's total exports. As of 17 February 2026, a total of 7.74 crore MSMEs are registered on the Udyam Registration Portal and the Udyam Assist Platform (UAP), which covers informal micro enterprises (IMEs) [67]. An analysis of MSME categorisation by sector highlights the majority focusing on trading, followed by services and manufacturing. Out of the 7.74 crore registered MSMEs, the composition is as follows:

- Trading enterprises: 3.32 crore
- Services enterprises: 2.79 crore
- Manufacturing enterprises: 1.61 crore

[65] Data collected from Tracxn Platform (Date accessed - July 15,2026)

[66] Press Information Bureau, "Union Budget 2026-27: Building Champion MSMEs for a Global India," Press Information Bureau, Government of India, Feb. 15, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2228306&reg=3&lang=2. [Accessed: July. 15, 2026].

[67] Ministry of Micro, Small and Medium Enterprises, "MSME Dashboard," Ministry of Micro, Small and Medium Enterprises, Government of India, 2026. [Online]. Available: https://dashboard.msme.gov.in/. [Accessed: July. 15, 2026].

The Union Budget 2026-27 has accorded high priority to building "Champion MSMEs" as part of its first 'Kartavya' of accelerating and sustaining economic growth [68]. A dedicated ₹10,000 crore SME Growth Fund has been proposed to create future leading enterprises by incentivising these entities based on select criteria. Along with this, the Self-Reliant India (SRI) Fund is to be augmented with an additional ₹2,000 crore to sustain support for micro-enterprises. A three-pronged approach is set to help MSMEs grow by providing (i) equity support, (ii) enhancing liquidity, and (iii) strengthening access to professional and managerial expertise,

IV. The technology sector in India

India's technology sector is one of the top contributors to its economy, generating an estimated USD 283 billion in revenue and employing nearly 6 million people in FY2025 [69]. The sector spans IT services, Engineering Research & Development (ER&D), Business Process Management (BPM) and hardware, with technology exports accounting for USD 224 billion in FY2025 [70]. The sector is further projected to cross USD 250 billion in revenue by FY 2029-2030.

Multinational Corporations

India has become a preferred destination for large-scale MNC technology investment, driven by its deep talent pool, expanding digital infrastructure, and growing domestic market. Major global technology companies have announced substantial investments in India in recent years, particularly in AI, cloud infrastructure, and R&D:

- Microsoft announced a USD 3 billion investment in cloud and AI infrastructure in January 2025 [71]. This was followed by a USD 17.5 billion commitment over four years in December

[68] Ministry of Finance, "Budget at a Glance 2026-2027," Budget Division, Department of Economic Affairs, Government of India, New Delhi, India, Feb. 2026. [Online]. Available: https://www.indiabudget.gov.in/doc/Budget_at_Glance/budget_at_a_glance.pdf. [Accessed: July. 15, 2026].

[69] A. Bhartiya, "India's Tech Ecosystem: Evolution from outsourcing hub to global innovation centre is reshaping office demand through talent-led growth," JLL Insights, Jones Lang LaSalle IP, Inc., Jun. 30, 2025. [Online]. Available: https://www.jll.com/en-in/insights/indias-tech-ecosystem. [Accessed: July. 15, 2026].

[70] Nasscom, "Technology Sector in India: Strategic Review - 2025: Beyond Disruption: Staying Future-Ready Today," National Association of Software and Service Companies, New Delhi, India, Rep., Feb. 2025. [Online]. Available: https://nasscom.in/knowledge-center/publications/technology-sector-india-strategic-review-2025. [Accessed: July. 10, 2026].

[71] Microsoft, "Microsoft announces US $3bn investment over two years in India cloud and AI infrastructure to accelerate adoption of AI, skilling and innovation," Microsoft Source Asia, Jan. 7, 2025. [Online]. Available: https://news.microsoft.com/source/asia/2025/01/07/microsoft-announces-us-3bn-investment-over-two-years-in-india-cloud-and-ai-infrastructure-to-accelerate-adoption-of-ai-skilling-and-innovation/. [Accessed: Aug. 1, 2026].

2025, its largest investment in Asia [72]. Microsoft's India Development Centre in Hyderabad, established in 1998, employs over 22,000 professionals across Bengaluru, Hyderabad, Pune, Gurugram, and Noida.

- Google announced a USD 15 billion investment in October 2025 to establish a dedicated AI hub and gigawatt-scale data centre campus in Visakhapatnam, Andhra Pradesh [73]. This marked Google's largest investment in India to date. Google maintains major engineering hubs in Bengaluru and Hyderabad, contributing to global products including Search, Android, and AI model development.

- Amazon is investing over USD 35 billion across its India businesses through 2030, focusing on AI-driven digitisation, export growth, and job creation [74]. Amazon's cloud arm (AWS) has also separately committed USD 12.7 billion for data centre expansion in Telangana and Maharashtra.

Collectively, Amazon, Microsoft, and Google pledged over USD 67 billion in investments in India [75]. This highlights India's rapidly growing strategic importance in global AI infrastructure planning.

Major Indian Technology Corporates

India's domestic technology sector is anchored by large, globally integrated IT services companies that account for a significant share of the country's export revenues. Some of the major IT companies in India are Tata Consultancy Services (TCS), Infosys, HCL Technologies (HCLTech), Wipro and Tech Mahindra. The following table lists some of these companies with their revenue and focus areas:

[72] Microsoft, "Microsoft invests US$17.5 billion in India to drive AI diffusion at population scale," Microsoft Source Asia, Dec. 9, 2025. [Online]. Available: https://news.microsoft.com/source/asia/2025/12/09/microsoft-invests-us17-5-billion-in-india-to-drive-ai-diffusion-at-population-scale/. [Accessed: Aug. 1, 2026].

[73] T. Kurian, "Our First AI Hub in India, Powered by a $15 Billion Investment," Google India Blog, Oct. 14, 2025. [Online]. Available: https://blog.google/intl/en-in/company-news/our-first-ai-hub-in-india-powered-by-a-15-billion-investment/. [Accessed: Aug. 1, 2026].

[74] Amazon Staff, "Amazon plans to invest $35 billion in India by 2030, powering the Atmanirbhar Bharat vision," About Amazon India, Dec. 10, 2025. [Online]. Available: https://www.aboutamazon.in/news/company-news/amazon-india-35-billion-investment-ai-jobs-exports. [Accessed: Aug. 2, 2026].

[75] ET Online, "$67 bn and counting: What drives the Great Indian Tech Gold Rush?," The Economic Times, Dec. 10, 2025. [Online]. Available: https://economictimes.indiatimes.com/news/company/corporate-trends/microsoft-amazon-google-india-investments-67-bn-and-counting-what-drives-the-great-indian-tech-gold-rush/articleshow/125887456.cms. [Accessed: Aug. 2, 2026].

Company	Headquarters	FY2025 Revenue	Key Focus Areas
Tata Consultancy Services (TCS)	Mumbai, Maharashtra	30.18	IT Services, BPM, Cloud, AI, ER&D
Infosys	Bengaluru, Karnataka	19.28	IT Services, AI, Digital Transformation
HCL Technologies	Noida, Uttar Pradesh	13.84	ER&D, IT Services, Software Products
Wipro	Bengaluru, Karnataka	10.51	IT Services, AI-led Transformation
Tech Mahindra	Pune, Maharashtra	6.26	IT Services, Telecom, BPM, AI

Table 2: Indian IT companies

Source: Annual financial disclosures by respective companies. Date accessed - 19/02/2026

These companies operate across IT services, ER&D, BPM and cloud platforms, serving clients across North America, Europe, and Asia-Pacific. A common thread across all major firms is the evolving integration of Generative AI and Agentic AI into their operations and products. This trend reflects a broader structural shift in the nature of technology services delivered from India. Beyond services, Indian technology corporates are increasingly investing in R&D and AI:

- TCS announced a Rs. 57,701 crore capital expenditure plan to build long-term digital and AI capabilities [76].
- Infosys has deployed over 300 Agentic AI solutions for clients, with AI-centric deal positioning and workforce reskilling central to its growth strategy [77].
- Wipro has invested USD 200 million in its corporate venture arm, Wipro Ventures, having invested in over 37 startups over the past decade [78].
- Reliance Industries' joint venture Digital Connexion announced an investment of Rs. 98,000 crore to build 1 GW of AI-native data centre capacity in Andhra Pradesh by 2030, targeting hyperscaler and enterprise AI workloads [79].

[76] ET Online, "TCS' $6.5 bn bet marks India's push against tech colonisation," The Economic Times, Oct. 31, 2025. [Online]. Available: https://economictimes.indiatimes.com/news/company/corporate-trends/tcss-6-5-bn-bet-marks-indias-push-against-tech-colonisation/articleshow/124991977.cms. [Accessed: July. 10, 2026].

[77] Moneycontrol, "Infosys deploying over 300 agentic AI solutions which deliver 5-15% productivity gains for clients: CEO Salil Parekh," Moneycontrol, Jul. 2026. [Online]. Available: https://www.moneycontrol.com/news/business/information-technology/infosys-deploying-over-300-agentic-ai-solutions-which-deliver-5-15-productivity-gains-for-clients-ceo-salil-parekh-13315662.html. [Accessed: Aug. 2, 2026].

[78] Wipro, "Wipro Commits $200 Million in Fresh Investment to Wipro Ventures," Wipro Newsroom, Feb. 26, 2025. [Online]. Available: https://www.wipro.com/newsroom/press-releases/2025/wipro-commits-200dollar-million-in-fresh-investment-to-wipro-ventures/. [Accessed: Aug. 2, 2026].

[79] A. Deep and V. Raghavendra, "Reliance JV to set up 1 GW data centre in Vizag at ₹98,000 crore investment," The Hindu, Nov. 26, 2025. [Online]. Available: https://www.thehindu.com/news/national/andhra-pradesh/reliance-jv-to-set-up-1-gw-data-centre-in-vizag-at-98000-crore-investment/article70325960.ece. [Accessed: Aug. 2, 2026].

3.7 Knowledge Capacity

For mapping the knowledge capacity, an analysis of research publications has been carried out to gauge the research output and institutional landscape in India. The OpenAlex database is used for this analysis, and document types of Article, Review Article and Data Paper have been considered. For the purposes of this analysis, the time period between 2016 and 2025 has been analysed.

In India, the research publications have been compared and analysed on the following parameters:

- Global comparison based on research publications
- Growth of Indian research publications over the years (2016-2025)
- Major areas of focus (research areas) based on research publications
- Indian knowledge hotspots based on publications in top journals
- India's International Joint Publications
- Areas of research focus through joint publications

A Brief Snapshot:

- India produced a total of 2,336,596 research publications between 2016 and 2025 [80].
- During this period, 14.26% of publications ranked within the top 10% globally and 1.53% were among the top 1% most-cited papers. As a contribution to top journals, 5.8% of all papers were published in top journals [81].
- International collaboration contributed to 24.33% of India's total publications, demonstrating strong global research partnerships.

[80] Data collected from OpenAlex platform

[81] Here top journals are calculated as the combined set of (i) the 178 journals tracked by the Nature Index (June 2026), (ii) 61 flagship journals in engineering, computer science, mathematics, agriculture and other fields, and (iii) journals ranked in the top 10% of their Scopus subject area by SCImago Journal Rank (SJR 2025), totalling to 3,512 distinct journals in all (see here). Of India's 2,370,550 publications indexed in OpenAlex for 2016–2025, 137,015 (5.8%) appeared in these journals.

- Open Access publications represented 57.07% of total output, indicating growing efforts toward accessible and transparent research dissemination.
- Industry collaboration contributed to 3.89% of India's total publications.
- Top 5 research focus areas: Nanofluid Flow and Heat Transfer; Agricultural Economics and Practices; Nanoparticles: Synthesis and Applications; Advanced Photocatalysis Techniques; Supercapacitor Materials and Fabrication.

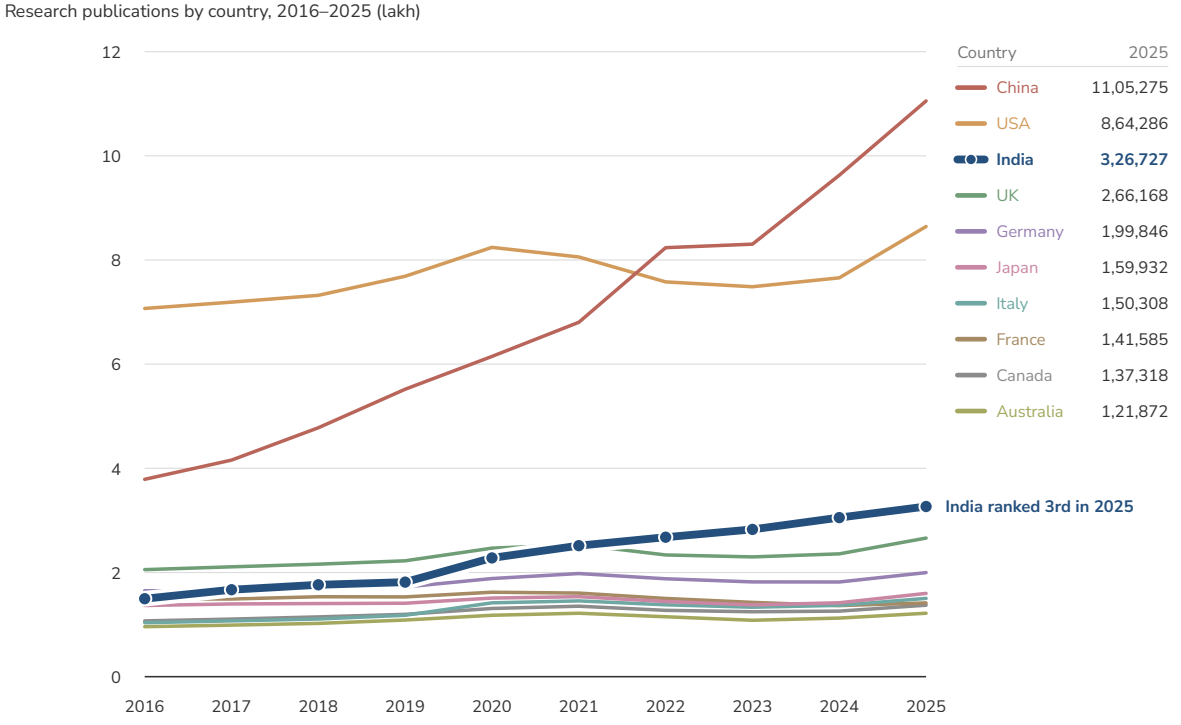
Global comparison based on research publications

An analysis of research publication output from 2016-2025 shows that the United States produced the highest absolute numbers of publications year on year from 2016 to 2021; China overtook the US in 2022 and has produced the largest number of research publications since, reaching about 1.1 million publications in 2025. India has shown a consistent upward trajectory and ranks third since 2021 - ahead of the United Kingdom, Germany and other major research systems. This highlights India's emergence as the third-largest research ecosystem by publication volume, with an output of nearly 327,000 publications in 2025 alone.

Fig 20. Global Comparison - Research Publications

Source: OpenAlex.

Date accessed: 14/08/2026



I. India's domestic research landscape

India's domestic research landscape has shown consistent growth over the years, both in terms of absolute volume and quality output.

India's research publication landscape over the years

A growing trend can be seen in research publications from 2016-2025, with nearly 3.27 lakh such outputs being published in 2025 itself. The total volume of publications shows a strong, sustained upward trend, more than doubling over the decade. Starting at approximately 149,733 in 2016, the output grew steadily and consistently every single year to reach a peak of 326,727 in 2025.

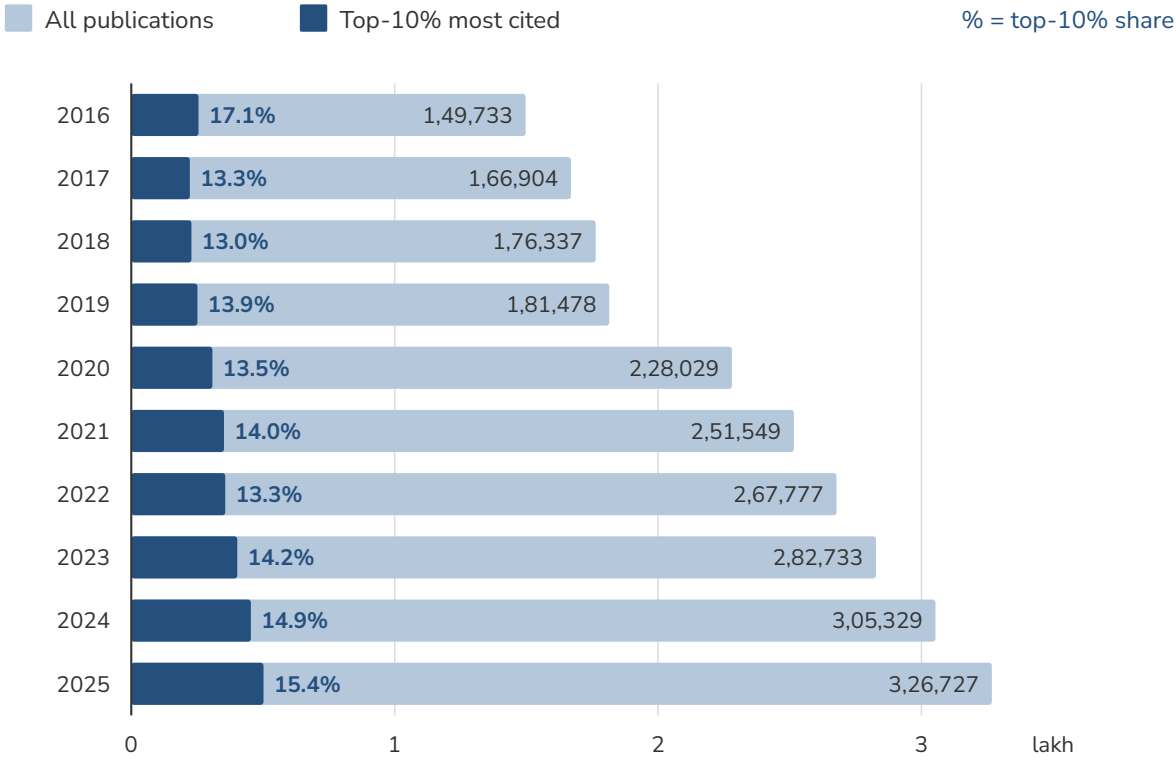


Fig 21. India's research publications over the years . **Source**: OpenAlex. *Date accessed: 14/08/2026*

In 2025, the share of publications in the 'Top 10% Globally' stood at 15.36% of India's total output. This suggests that while the scale of output has grown rapidly, the foundation for high-quality research is also robust. The Indian research ecosystem is on the path to further elevate its global standing in the coming years.

Major areas of focus based on research publications

India's research publications showcase a research portfolio that remains diversified across science and technology sectors. The portfolio spans areas like thermal and materials engineering, agriculture, and nanomaterials, while also showing meaningful output in drug discovery and communications technology.

- The area of 'Nanofluid Flow and Heat Transfer' is the most focused area of research, with a total output of 12,695 publications. This focus reflects the depth of India's thermal and fluid engineering research base, closely followed by 'Agricultural Economics and Practices' (12,003 publications) and 'Nanoparticles: synthesis and applications' (11,108 publications), pointing to sustained strength in applied agricultural research and nanomaterials science.

- A substantial portion of the research volume remains concentrated in foundational material and chemical sciences. These include areas like Advanced Photocatalysis Techniques (10,370), Supercapacitor Materials and Fabrication (9,141), Synthesis and Biological Activity (7,484) and Aluminum Alloys Composites Properties (7,280). This highlights India's continued strong foundational capabilities in materials and chemical sciences - essential for supporting the broader industrial ecosystem.

- The presence of Antenna Design and Analysis (6,696 publications) and Computational Drug Discovery Methods (6,924 publications) among the top 10 focus areas also highlights a continued competitive edge in communications engineering and computational life sciences. India's broader digital technology strength is also visible at a broader level: Computer Networks and Communications (31,776 publications) and Computer Vision and Pattern Recognition (27,676 publications) both rank among India's largest research subfields overall, even though they are distributed across many narrower topics rather than concentrated in a single one.

S.No.	Focus Area	Publications	What It Covers	Thematic Cluster
1	Nanofluid Flow and Heat Transfer	12,695	Heat transfer and fluid dynamics using nanofluids for thermal engineering and cooling systems	Energy & Engineering
2	Agricultural Economics and Practices	12,003	Economic analysis of agricultural production, markets, and farming practices	Life Sciences & Agriculture
3	Nanoparticles: Synthesis and Applications	11,108	Design, synthesis and characterisation of nanoparticles for materials and biomedical applications	Chemistry & Materials
4	Advanced Photocatalysis Techniques	10,370	Photocatalytic materials and processes for pollutant degradation, solar fuel and clean energy applications	Chemistry & Materials
5	Supercapacitor Materials and Fabrication	9,141	Materials and fabrication techniques for supercapacitor-based energy storage devices	Energy & Engineering
6	Phytochemicals and Medicinal Plants	7,936	Bioactive compounds from plants and their pharmacological and medicinal properties	Life Sciences & Agriculture
7	Synthesis and Biological Activity	7,484	Chemical synthesis routes and their resulting biological and pharmacological activity	Chemistry & Materials
8	Aluminum Alloys Composites Properties	7,280	Microstructure, properties and processing of aluminium alloys and metal matrix composites	Energy & Engineering
9	Computational Drug Discovery Methods	6,924	Computational and AI-driven methods for identifying and designing new drug candidates	Life Sciences & Agriculture
10	Antenna Design and Analysis	6,696	Design, analysis and optimisation of antennas for wireless and communication systems	Digital Technologies

Table 3: India's research publications - Focus areas. **Source**: OpenAlex. Date accessed: 14/08/2026

Note: The thematic clusters assigned to each focus area represent a grouping of OpenAlex Topics into broader disciplinary categories. These clusters are intended solely to aid category understanding and themes across the data.

A significant strength of a national research system lies not only in its dominant focus areas but also in the range and depth of its broader publication footprint. The broader publication portfolio also includes focus areas that align directly with India's flagship science and technology missions and policy priorities.

The following areas of particular relevance may be noted:

- Artificial Intelligence: India has a significant and growing publication presence in AI research, a field at the centre of the AI Mission. When considered alongside Computer Vision & Pattern Recognition and Natural Language Processing, India's AI-relevant research base spans a wide spectrum of the mission's core technology areas.

- Quantum Mechanics: Research in quantum physics is the scientific base of the National Quantum Mission, alongside a dedicated Quantum Information & Cryptography research base covering quantum computing, communication and cryptography applications.

- Electrochemistry: This area is of direct relevance to the green hydrogen mission, while a separate and larger base of battery materials research is of direct relevance to EV-related battery technology programmes such as the MAHA EV Mission.

- Similarly, research areas of semiconductor materials & devices, semiconductor quantum structures and radio frequency integrated circuit design are of direct relevance to the semiconductor mission.

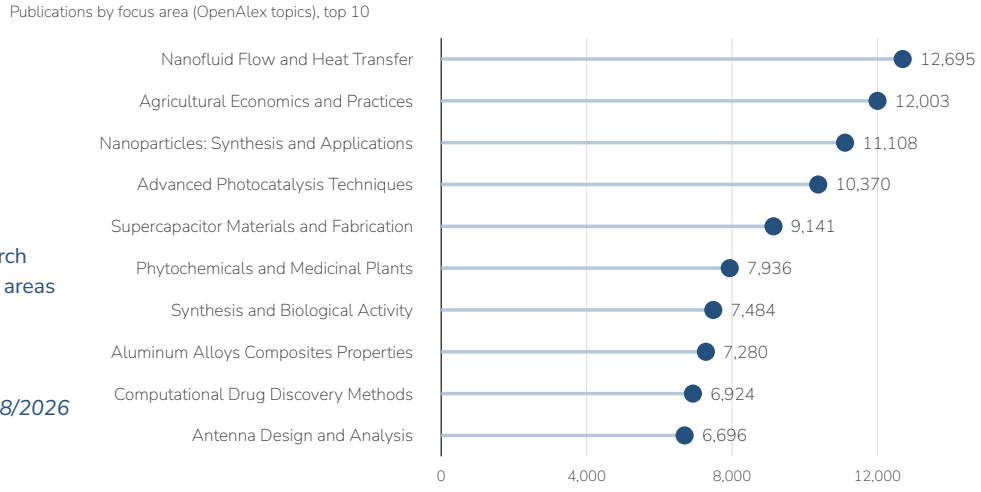


Fig 22. India's research publications - Focus areas

Source: OpenAlex.

Date accessed: 14/08/2026

Alignment of Research Focus Areas with National Missions & S&T Programmes

The table below maps identified research areas to the corresponding national missions and programmes:

National Mission / Programme	Research Area	Research Output
AI Mission	Artificial Intelligence; Computer Vision & Pattern Recognition; Natural Language Processing	38,899 ; 27,676 ; 1,127
Quantum Mission	Quantum Mechanics; Quantum Information & Cryptography	1,224 ; 1,552
NM-ICPS	Wireless Sensor Networks; Internet of Things & AI; Network Security & Intrusion Detection; Cloud Computing & Resource Management	5,142 ; 771 ; 5,851 ; 4,205
Green Hydrogen	Electrochemistry; Photocatalysis; Electrocatalysts for Energy Conversion; Hydrogen Storage & Materials	1,602 ; 10,347 ; 5,118 ; 1,093
Deep Ocean Mission	Oceanography & Atmospheric Processes; Underwater Vehicles & Communication Systems; Marine Biology & Environmental Chemistry	736 ; 818 ; 189
Indian Semiconductor Mission / Electronics	Semiconductor Materials & Devices; Semiconductor Quantum Structures; Radio Frequency IC Design; 2D Materials	1,962 ; 619 ; 563 ; 3,154
BioE3 / BioPharma	Bioengineering; Microbial Metabolic Engineering & Bioproduction; Biofuel Production & Bioconversion	1,151 ; 955 ; 3,410
One Health	Virology & Viral Diseases; Animal Disease Management & Epidemiology; Crop Yield & Soil Fertility; Water Treatment	1,084 ; 734 ; 3,956 ; 1,279
Space	Astronomy & Astrophysics; Remote-Sensing Image Classification; Spacecraft Technologies (dynamics, control & cryogenics)	17,900 ; 1,539 ; 554
Nuclear Mission	Nuclear Physics; Magnetic Confinement Fusion	2,211 ; 408
MAHA EV Mission (ANRF)	Electric Vehicles & Infrastructure: Advancements in Battery Materials	1,968 ; 3,834
NTTM (Textile)	Textile Materials & Evaluations	1,108
Drones / UAVs	UAV Applications & Optimisation; Remote Sensing in Agriculture; Modular Robots & Swarm Intelligence	870 ; 1,473 ; 224
National Critical Mission	Metallurgical Processes & Thermodynamics; Extraction & Separation Processes; Recycling & Waste Management Techniques	555 ; 1,296 ; 1,542

Table 4: Alignment of focus areas - National Missions.
Source: OpenAlex. Date accessed: 14/08/2026

India's publication landscape represents a research system that is simultaneously deep in its dominant specialisations and broad in its coverage of mission-critical domains.

The concentration of output in energy, materials, and ICT-related fields provides an established scientific base upon which national missions in electric vehicles, green hydrogen, and digital infrastructure can draw.

At the same time, the growing research output in AI, quantum science, semiconductor technology, space, and nuclear research signals an emerging research ecosystem.

The later section of this outlook (chapter 4) elucidates these national missions in greater detail.

II. Indian knowledge hotspots based on publications in top journals

India is home to several emerging and established knowledge hotspots in science and technology, spanning national research institutes, academic institutions, and science agencies.

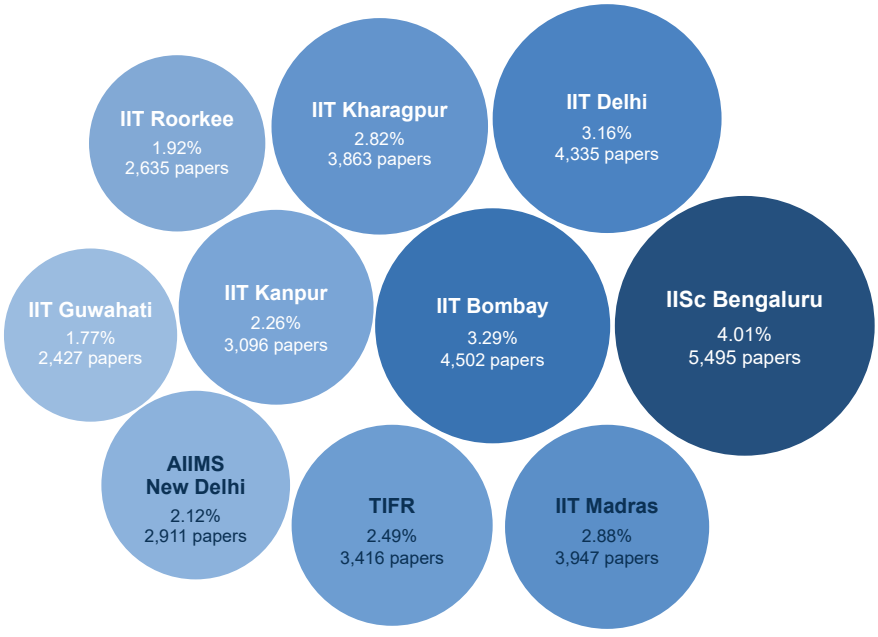


Fig 23. India's research publications - knowledge hotspots (share of India's publications in top journals)
Source: OpenAlex; journal lists from Nature Index (June 2026), SCImago Journal Rank (2025) and a discipline-flagship list.
Date accessed: 25/09/2026

Methodology note: Knowledge hotspots are identified here by where institutions publish. Each institution's score is its share of India's publications in top journals in 2016-2025, across all fields. A publication has been counted as top-journal publication if it appears in (i) the 178 publications on the Nature Index list (June 2026), (ii) 61 flagship journals in engineering, computer science, mathematics and agriculture, or (iii) a journal in the top 10% of its Scopus subject area by SCImago Journal Rank (SJR 2025) - about 3,500 journals in all, covering every field of India's 2016-2025 output.

For a compiled listing of these journals, please access here.

Scan QR to access the Annexure

The Indian Institute of Science (IISc), Bengaluru leads, accounting for 4.01% of India's papers in top journals (5,495 papers in 2016-2025). It is followed by IIT Bombay (3.29%), IIT Delhi (3.16%), IIT Madras (2.88%) and IIT Kharagpur (2.82%). The Tata Institute of Fundamental Research, IIT Kanpur, the All India Institute of Medical Sciences-New Delhi, IIT Roorkee and IIT Guwahati are among the hotspots for knowledge production in top journals.

III. International collaboration

India's research output shows an active and growing international footprint: 24.33% of India's total research output between 2016 and 2025 involved international co-authorship. The United States, United Kingdom, China, Germany and Australia are the leading collaborators, and the European Union, taken as a bloc, stands second after the United States. The volume, quality and subject-area composition of India's international S&T collaboration based on research publications is analysed in detail in Chapter 5, Section 5.3 (I. International Joint Publications).

3.8 Patents

To analyse the patent landscape and IP capital of India's STI ecosystem, patents filed with the Indian Patent Office have been considered to ensure a comprehensive view of India's patent landscape. For the below patent snapshot and analysis, the WIPO statistics database has been employed along with the annual reports by the Office of the Controller General of Patents, Designs, Trademarks and Geographical Indications.

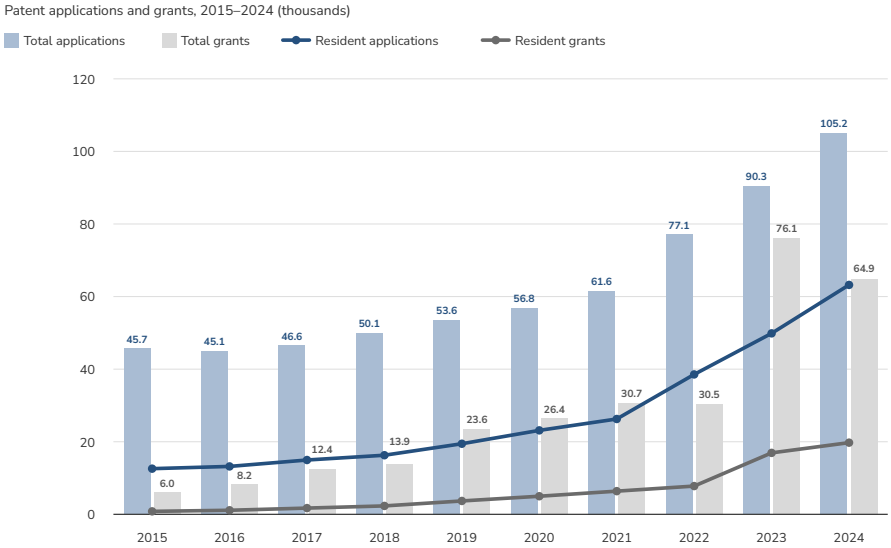
In India, the research publications have been compared and analysed on the following parameters:

- Total patent applications filed and granted between 2015-2024
- Patent publications by field of invention
- Top countries filing in India (through PCT route) - 2024
- Patent applications filed in 2024-2025 according to state of origin

I. Total patent applications filed and granted between 2015-2024

Fig 24. Total patent applications filed and granted between 2015-2024

Source: WIPO statistics database. *Date accessed - 11/02/2026*



There has been a consistent growth in patent applications in the last ten years with 2024 recording over 1 lakh patent applications. The total number of patent grants also grew from 6,022 in 2015 to 64,941 in 2024, highlighting a CAGR of over 30% in the past decade. The growing number of patents being granted signify a higher emphasis on quality patent applications and a more matured R&D ecosystem in the country.

- The total volume of patent applications has more than doubled over the last ten years, growing from 45,658 in 2015 to 105,157 in 2024. This highlights a CAGR of over 9.7% in the past decade. This growth is even more prominent post 2020 (the year marked by the covid-19 pandemic) where the patent application grew at double-digit year-on-year growth from 2021-2022 (~25%) to 2023-2024 (~17%).

- The resident applications in this time period have grown considerably from around 30% of the total applications in 2015 to nearly 60% in 2024. This signifies a CAGR of around 20% and matured domestic R&D base with a rising trend of domestic IP creation within national institutions and startups.

- Resident patent applications being granted have shown a significantly high CAGR of around 42%, while the CAGR for non-resident patent applications is around 27%. Consequently, the share of patents granted to Indian residents has more than doubled, growing from around 15% in 2015 to nearly 31% in 2024.

- A major characteristic this decade has shown is the inversion of domestic versus foreign filings - where domestic applications have surpassed foreign applications as the primary driver of IP in India.

The patent trends for India have demonstrated growing market potential for international players as well as rising IP capabilities domestically. The consistent rise of resident filings and grants highlight that domestic innovation is increasingly playing a central role in India's IP landscape. India's patent trajectory between this time period signifies an IP landscape that has scaled to grow ten times in volume (based on number of patents granted).

II. Patent publications - categorised by technology (between 2024-2025)

The annual report on intellectual property by Office of the Controller General of Patents, Designs, Trademarks and Geographical Indications for 2024-25 lists the fields of inventions based on published patents. Following table lists the top fields of inventions based on the published patents:

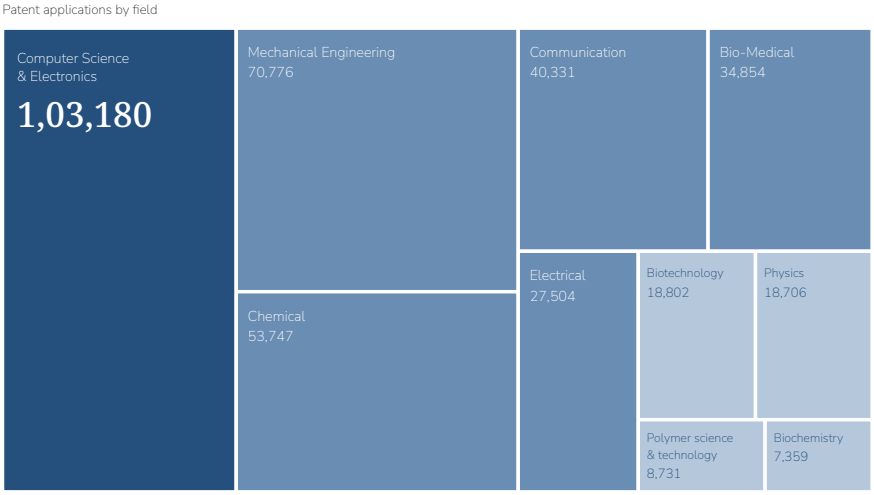


Fig 25. Patent publications - categorised by technology (between 2024-2025)

Source: Intellectual Property India – Annual Report (2024).

Date accessed - 6/02/2026

***Note**: The graph represents cumulative data between the time period of 2020-2021 and 2024-2025. The numbers for Chemical Applications include Pharmaceutical Applications as well.*

In the last five years (from 2020-2021 to 2024-2025), the major technology areas focused by the Indian IP ecosystem are under the domain of Computer Science & Electronics, Mechanical Engineering, Chemical, BioMedical and Communication. The focus areas highlight India's diversified base across software, hardware, life sciences and traditional engineering areas.

- Computer Science & Electronics (1,03,180) and Mechanical Engineering (70,776) emerge as the top two fields with the most number of patents published, cumulatively accounting for nearly 40% of the top 10 patent focus areas. After the digital focus, the focus on the mechanical engineering domain highlights India's strength in a foundational industrial base

- Apart from focus on these two areas, the top 10 focus areas also include focus on Chemical Applications (with 53,747 patents), Communication (with 40,331 patents), and Bio Medical (with 34,854 patents), highlighting a focused depth in scientific research. In the last five years, the Indian innovation ecosystem has been innovating across fields - from software to healthcare and advanced materials.

III. Top countries filing in India (through PCT route) - 2024

The Patent Cooperation Treaty (PCT), administered by the World Intellectual Property Organization (WIPO), is a global framework for seeking international patent protection [82]. The United States, Japan and China are the leading filers of patent applications in India through the PCT national phase route, together accounting for the majority of such filings in 2024 [see Chapter 5]. This inbound filing activity, alongside India's own outbound international patent filings, is analysed as a measure of India's international patent engagement in Chapter 5, Section 5.3 (II. International joint Innovation).

IV. Patent applications filed in 2024-2025 according to state of origin

Tamil Nadu with 15,440 applications occupies the first position for the total number of patent applications in India, highlighting the strong industrial and R&D base in the state. Karnataka and Maharashtra occupy second and third place with 8,371 and 7,893 applications, respectively.

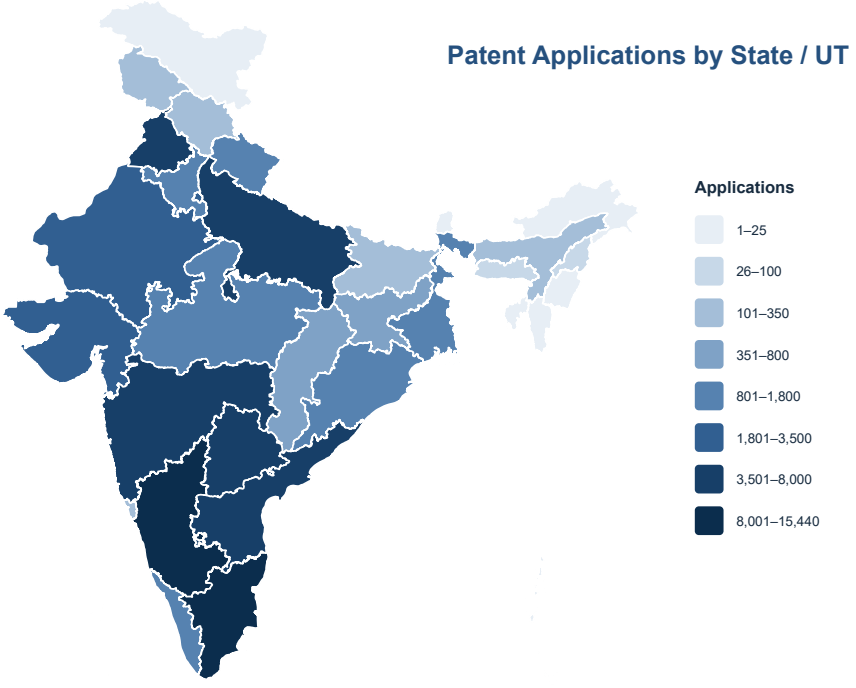


Fig 26. Patent applications filed in 2024-2025 according to state of origin

Source: Intellectual Property India – Annual Report (2024).

Date accessed 11/02/2026

***Note**: Data represents total applications for each state. Total applications are a sum of ordinary applications, conventional applications and national phase applications.*

[82] World Intellectual Property Organization, "PCT – The International Patent System," WIPO, Geneva, Switzerland, 2026. [Online]. Available: https://www.wipo.int/en/web/pct-system. [Accessed: Aug. 2, 2026].

3.9 High Technology Export

I. India's overall trade balance

According to the ITC trade map database [83], during 2021–2025, India's merchandise trade [84] expanded steadily between 2021 and 2025. It reflects deeper integration with global goods markets. Over this period, exports rose from USD 395 billion to USD 447 billion. Imports increased from USD 570 billion to USD 753 billion.

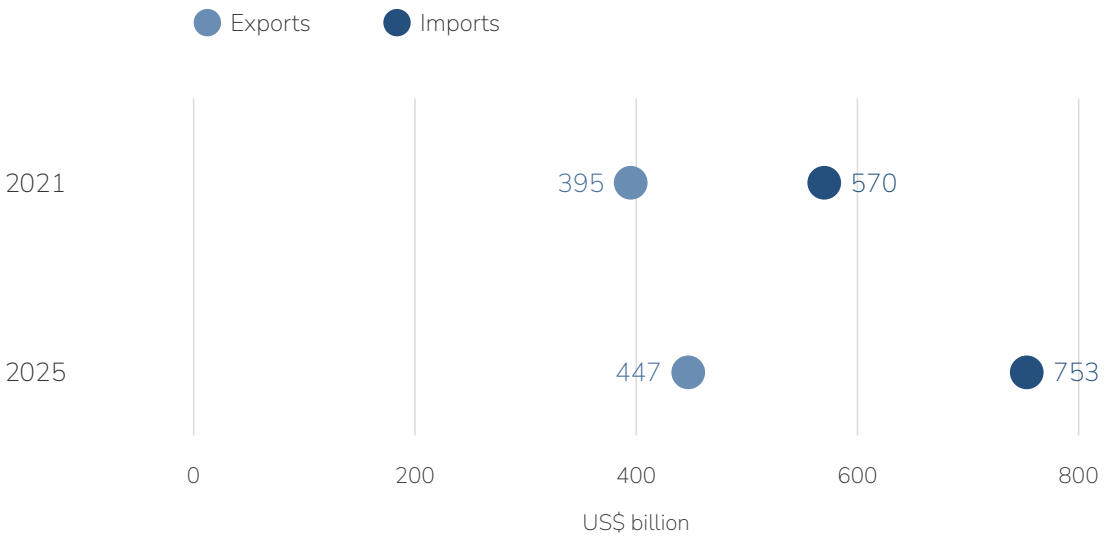


Fig 27. India Export and Import Growth (2021-2025). **Source**: ITC Trade Map. *Date accessed Aug 13, 2026*

II. India's Global Export Share in High-Technology Products

High-technology products refer to goods with high R&D intensity. They include categories such as aerospace, computers & electronics, pharmaceuticals, scientific instruments, and advanced machinery [85]. In this section, the estimates are drawn from the ITC Trade Map high-technology product HS classification. India's share of global high-technology exports increased from 0.98% in 2021 to 1.53% in 2025. The upward trend is supported by India's export value in high-technology products rising from USD 58.1 billion in 2021 to USD 107.04 billion in 2025. In the same period, Global high-technology exports increased from USD 5.96 trillion to USD 7.04 trillion.

[83] International Trade Centre, "Trade Map: Trade Statistics for International Business Development," International Trade Centre, Geneva, Switzerland, 2026. [Online]. Available: https://www.trademap.org/Index.aspx. [Accessed: Aug 13, 2026].

[84] It captures the balance for goods exports and goods imports, while excluding services such as IT, business services, and travel

[85] HS code, 30,85,87,88 were utilised for collecting data for high tech products

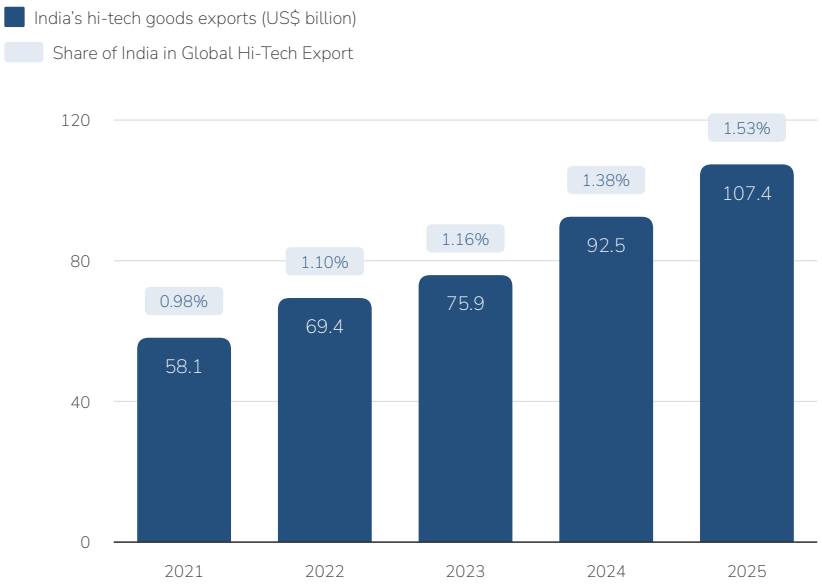


Fig 28. India's High Tech Export and Global Export Share (2021-25)

Source: ITC Trade Map, *Date accessed Aug 13, 2026*

III. High-Technology exports as a share of India's total exports

As per the same classification, High-Technology exports account for a meaningful and rising share of India's overall merchandise export from 2021 to 2025. The share was 14.71% in 2021, increased to 15.32% in 2022, and then strengthened to 17.61% in 2023, 21.07% in 2024 and 24.03% in 2025. The 2025 level is the highest, representing a 9.32 percentage-point increase over the 2021 level, indicating an improvement in the technology intensity of exports over the period.

IV. Major Export and Import Products from India (2020–2025)

India's merchandise trade from 2021 to 2025 shows a concentrated set of product groups driving both exports and imports. On the export side, the leading items include mineral fuels and refined oil products, alongside electrical machinery and equipment, machinery and mechanical appliances, precious metals and stones, and pharmaceutical products. The presence of electrical machinery and equipment, machinery and mechanical appliances, and pharmaceutical products among the top export categories is particularly relevant, as these groups align closely with high-technology, high–R&D–intensity product segments. India's exports reflect both scale in traditional commodity-linked lines and a strengthening base in technology-linked manufacturing, engineering and electronic goods [86].

[86] Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry, Government of India, "Quarterly Review of Merchandise Foreign Trade: January–March, 2026," DGCI&S, Kolkata, India, Jun. 2026. [Online]. Available: https://dgciskol.gov.in/writereaddata/Downloads/20260608125806Report%20Q4%20FY25-26.pdf.

On the import side, the leading items include mineral fuels and oil products, electrical machinery and equipment, machinery and mechanical appliances, precious metals and stones, and organic chemicals. The overlap between export and import baskets for electrical machinery/equipment and vehicles other than railway or tramway rolling-stock indicates deep integration into global manufacturing value chains: imports support domestic production through capital goods, components, and intermediate inputs, while exports reflect growing assembly, manufacturing, and engineering capabilities in these same product families. This interpretation is also consistent with a recent report noting a gradual shift in India's export structure toward medium- to high-technology products, with electrical machinery and parts emerging as a leading high-technology export line in recent years [87].

In sectoral terms, the data shows particularly strong growth in electrical machinery and equipment exports, which increased from USD 19 billion in 2021 to USD 54 billion in 2025, while pharmaceutical exports increased from USD 19 billion to USD 26 billion over the same period. Exports of vehicles other than railway or tramway rolling stock also increased from USD 19 billion in 2021 to USD 25 billion in 2025. The last in this category, aircraft, spacecraft, and parts, increased from USD 1.1 billion to USD 2.4 billion. In total, India's High-Tech Exports increased from USD 58.1 billion to USD 107.4 billion..

[87] NITI Aayog, Government of India, "Trade Watch: Quarterly (October–December [Q3] FY25)," NITI Aayog, New Delhi, India, Jul. 2025. [Online]. Available: https://www.niti.gov.in/sites/default/files/2025-07/Trade-Watch-Quarterly.pdf.

3.10 Global Innovation Index: India's Recent Performance and Key Signals

38th
India's GII ranking out of 139 economies

1st
in Central and Southern Asia

25th
In innovations outputs

The World Intellectual Property Organisation (WIPO) Global Innovation Index 2026 places India at 38th out of 139 economies. India also ranks 1st in Central and Southern Asia. Indian cities such as Bengaluru, Delhi, and Mumbai are among the top 50 most innovation-intensive clusters in the world [88].

From 2021 to 2026, India's overall GII rank shows a steady upward trend. In 2026, India's innovation outputs ranked 25th, improving from 32nd in 2025, while innovation inputs rank 49th, improving from 52nd. This indicates that India's recent performance is driven more strongly by output-side results than by a proportional rise in measured inputs.

According to the report, India performs strongly globally in several domains. These include ICT services exports (ranked 1st), late-stage venture capital deals (ranked 4th), and unicorn valuation (ranked 10th). These indicators signal depth in digital services capability, scale-up financing, and platform-led value creation, which align with India's improving output rank.

The Innovation Capabilities Outlook 2026 report reinforces India's strengthening performance. Over 2001–2023, India records a sharp expansion in several per-capita innovation proxies, such as scientific publications rising by about 9.7 times, patents by about 5.8 times, high-tech exports by about 4.7 times, and trademarks by about 6.9 times. It also classifies India among "newcomer" economies that are increasingly prioritising more complex innovation capabilities. Over 2014–2023, India achieved smart diversification[89] in 7 of 10 years, it expanded into a wider set of innovation capabilities while also increasing their overall complexity[90].

[88] World Intellectual Property Organization, *Global Innovation Index 2026: Powering Entrepreneurs at the Frontier of Science*. Geneva, Switzerland: WIPO, 2026. [Online]. Available: https://www.wipo.int/web-publications/global-innovation-index-2026/assets/110523/2000-2026-en-global-innovation-index-2026-powering-entrepreneurs-at-the-frontier-of-science.pdf [Accessed: Sep. 30, 2026]

[89] Smart diversification: The report uses "smart diversification" to mean gaining breadth and complexity at the same time i.e., an ecosystem adds new capabilities (greater breadth/diversity) while also moving toward more complex capabilities.

[90] Capability complexity: "Capability complexity" is defined as a composite ecosystem measure that uses a weighted average of capability complexity scores together with the ecosystem's diversity score, to reflect how sophisticated the overall capability portfolio is.

Abbreviations

AISHE
All India Survey on Higher Education

AIC
Atal Incubation Centre

AIM
Atal Innovation Mission

AIIMS
All India Institute of Medical Sciences

AICTE
All India Council for Technical Education

AMTZ
Andhra Pradesh MedTech Zone

ANRF
Anusandhan National Research Foundation

AR/VR
Augmented Reality / Virtual Reality

ASIC
Application-Specific Integrated Circuit

ASPIRE
IIT Bombay Research Park

AWS
Amazon Web Services

BBC
Bangalore Bioinnovation Centre

BEL
Bharat Electronics Limited

BERD
Business Enterprise R&D

BIG
Biotechnology Ignition Grant

BIRAC
Biotechnology Industry Research Assistance Council

BPM
Business Process Management

C-MET
Centre for Materials for Electronics Technology

CAGR
Compound Annual Growth Rate

CCMB
Centre for Cellular and Molecular Biology

CITS
Craft Instructor Training Scheme

CPSE
Central Public Sector Enterprise

CSIR
Council of Scientific and Industrial Research

CTS
Craftsmen Training Scheme

DAE
Department of Atomic Energy

DBT
Department of Biotechnology

DGT
Directorate General of Training

DOS
Department of Space

DPIIT
Department for Promotion of Industry and Internal Trade

DRDO
Defence Research and Development Organisation

DSIR
Department of Scientific and Industrial Research

DST
Department of Science and Technology

ER&D
Engineering Research & Development

FDI
Foreign Direct Investment

FITT
Foundation for Innovation and Technology Transfer

FTE
Full-Time Equivalent

GCC
Global Capability Centre

GDP
Gross Domestic Product

GERD
Gross Expenditure on Research and Development

GII
Global Innovation Index

HAL
Hindustan Aeronautics Limited

HCL / HCLTech
HCL Technologies

HS
Harmonised System (Product Classification)

ICAR
Indian Council of Agricultural Research

ICMR
Indian Council of Medical Research

ICT
Information and Communication Technology

IIIT
Indian Institute of Information Technology

IISc
Indian Institute of Science

IISER
Indian Institute of Science Education and Research

IIT
Indian Institute of Technology

IITMRP
IIT Madras Research Park

IME
Informal Micro Enterprise

INI
Institute of National Importance

IN-SPACe
Indian National Space Promotion and Authorisation Centre

IoT
Internet of Things

ITC
International Trade Centre / ITC Trade Map

ITI
Industrial Training Institute

KITS
Karnataka Innovation and Technology Society

MAHA-EV
Mission for Advancement in High Impact Areas - Electric Vehicle

MeitY
Ministry of Electronics and Information Technology

ML
Machine Learning

MNRE
Ministry of New and Renewable Energy

MoEFCC
Ministry of Environment, Forest and Climate Change

MoES
Ministry of Earth Sciences

MSDE
Ministry of Skill Development & Entrepreneurship

MSME
Micro, Small and Medium Enterprises

NAPS
National Apprenticeship Promotion Scheme

NDTSP
National DeepTech Startup Policy

NIDHI-TBI
National Initiative for Developing and Harnessing Innovations - Technology Business Incubator

NIPER
National Institute of Pharmaceutical Education and Research

NIRF
National Institute of Ranking Framework

NIT
National Institute of Technology

NITTT
National Initiative for Training of Technical Teachers

NM-ICPS
National Mission on Interdisciplinary Cyber-Physical Systems

NSDC
National Skill Development Corporation

NSTMIS
National Science and Technology Management Information System

PG
Postgraduate

PMKVY
Pradhan Mantri Kaushal Vikas Yojana

PSE
Public Sector Enterprise

QuRP
Quantum Research Park

QKD
Quantum Key Distribution

R&D
Research and Development

RDI
Research, Development and Innovation

RISC-V
Reduced Instruction Set Computer - V

SAIL
Steel Authority of India Limited

SDG
Sustainable Development Goal

SIRO
Scientific and Industrial Research Organisation

SoC
System-on-Chip

SRI
Self-Reliant India

STPI
Software Technology Parks of India

TCS
Tata Consultancy Services

TIDE
Technology Incubation and Development of Entrepreneurs

TIH
Technology Innovation Hub

TRL
Technology Readiness Level

TRP
Technology Research Park

TTRP
Technology Translation Research Parks

UAP
Udyam Assist Platform

UG
Undergraduate

UGC
University Grants Commission

UIS
UNESCO Institute for Statistics

UNCTAD
United Nations Conference on Trade and Development

USD
United States Dollar

UT
Union Territory

WIPO
World Intellectual Property Organisation

Figures

Fig 1
Increase in GERD as a share of GDP

Fig 2
Public and Private Investment in National R&D

Fig 3
Select sector-wise expenditure on R&D

Fig 4
Expenditure On R&D by Select Major Scientific Agencies

Fig 5
STEM Enrolment in India: Gender Composition (2016-17 to 2023-24)

Fig 6
Total STEM Graduates in India (2021)

Fig 7
Gender Gap in STEM Graduates Country-Wise (2021)

Fig 8
Top 12 Substreams of Engineering & Technology (by Enrolment)

Fig 9
Researchers per million Inhabitants in India (2000-2024)

Fig 10
State-wise distribution of INIs in India

Fig 11
R&D centres of Core Science Ministries and Departments

Fig 12
State Govt R&D Institutions and centres

Fig 13
State/UT-Wise Incubator Distribution in India

Fig 14
State/UT-Wise Accelerators Distribution in India

Fig 15
Technology Innovation Hubs (TIHs) under NM-ICPS

Fig 16
Top 15 Industries - Indian Startups

Fig 17
Indian Startups - by stage

Fig 18
Indian Startups - by residential state

Fig 19
Private Investments in India

Fig 20
Global Comparison - Research Publications

Fig 21
India’s research publications over the years

Fig 22
India’s research publications - Focus areas

Fig 23
India's research publications - knowledge hotspots (share of India's publications in top journals)

Fig 24
Total patent applications filed and granted between 2015 and 2024

Fig 25
Patent publications - categorised by technology (between 2024-2025)

Fig 26
Patent applications filed in 2024-2025 according to state of origin

Fig 27
India Export and Import Growth (2021-2025)

Fig 28
India's High Tech Export and Global Export Share (2021-25)

Tables

Table 1
List of Major Skill Programs run by the Government of India

Table 2
Revenue and focus area of Indian IT companies

Table 3
India's research publications - Focus areas

Table 4
Alignment of focus areas - National Missions

India STI Outlook 2026

Chapter IV

Missions & Policies

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

India's science, technology, and innovation (STI) landscape is being shaped by mission-oriented programmes and policies that aim to build capability in strategic sectors, accelerate technological development, and address national priorities. This chapter provides a structured map of that landscape, organised into two sections: key missions and key policies. The chapter is intended to serve as a concise reference for understanding how India is organising its mission-driven and policy-led approach to the STI ecosystem.

Outline

4.1 Missions

I. IndiaAI Mission 156

II. National Quantum Mission 162

III. Mission on Interdisciplinary Cyber-Physical Systems 168

IV. India Semiconductor Mission 174

V. Biopharma SHAKTI 180

VI. Deep Ocean Mission 181

VII. Drone Shakti Mission 186

VIII. National Green Hydrogen Mission 187

IX. National One Health Mission 193

X. Carbon Capture, Utilisation, and Storage (CCUS) 197

XI. Electric Vehicle Missions 198

XII. Mission Mausam 202

XIII. National Critical Minerals Mission 205

XIV. National Technical Textiles Mission 211

4.2 Policies

I. Biotechnology for Economy, Environment and Employment (BioE3) 216

II. Geospatial Policy 2022 218

III. Indian Space Policy 2023 220

IV. National Education Policy 2020 222

V. National Policy on Electronics 2019 224

VI. Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Act (SHANTI Act) 226

4.1 Missions

I. IndiaAI Mission

Point of Contact
CEO, IndiaAI Mission,
ceo-indiaai@nic.in

URL
https://indiaai.gov.in/

The IndiaAI Mission is anchored by the Ministry of Electronics and Information Technology (MeitY) and was announced on 7th March, 2024. It is designed to build a comprehensive AI ecosystem in India through coordinated public–private programmes. The IndiaAI Independent Business Division (IBD) under the Digital India Corporation (DIC) implements the mission[91].

Budget

The project was approved with an outlay of ₹10,371.92 crore (~ US$ 1.13B) over five years (2024–28). India's AI ecosystem is also receiving increasing private-sector support. In 2025, India attracted US$4.09B in private AI investment, making it the 6th highest-funded country globally [92]. Between 2013 and 2025, India received a cumulative US$15.39B in private AI investment and ranked 8th globally [93].

Objective

The IndiaAI Mission aims to democratise access to AI infrastructure and improve the availability and quality of data. It supports the development of indigenous foundational models and sector-specific AI applications with positive public and social impact. The Mission also seeks to expand the AI talent pool and improve access to financing for startups. Responsible AI safeguards are intended to make AI adoption trustworthy, safe and scalable [94].

Implementation and Functional Architecture

The IndiaAI Mission is carried out using seven pillars that connect the basic tools needed for AI, like computing power and data, with creating models, developing applications, building skills, funding startups, and ensuring responsible AI practices. It enables the widespread growth and use of AI capabilities across the population.

[91] Cabinet. Press Information Bureau, "Cabinet approves ambitious IndiaAI mission to strengthen the AI innovation ecosystem," Cabinet, Mar. 7, 2024. [Online]. through seven pillars that connect the basic tools needed for AI, such as computing power and data, toAvailable: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2012355.

[92] Stanford Institute for Human-Centered Artificial Intelligence, "Artificial Intelligence Index Report 2026," Stanford University, Stanford, CA, USA, Apr. 2026. [Online]. Available: https://hai.stanford.edu/assets/files/ai_index_report_2026.pdf.

[93] Ibid 2

[94] Ministry of Electronics and Information Technology, "INDIAai: The National AI Portal of India." [Online]. Available: https://indiaai.gov.in/. [Accessed: Mar. 5, 2026].

IndiaAI Innovation Centre

Contact info
General Manager, gm-foundationmodels@indiaai.gov.in

The IndiaAI Innovation Centre is the mission's hub for the development and deployment of foundational models, with emphasis on indigenous Large Language Multimodal models (LLMs) and domain-specific foundational models. These models are intended to support high-impact applications across priority sectors such as governance, healthcare, agriculture, sustainability, and manufacturing, including use cases with higher resource needs.

IndiaAI Application Development Initiative

Contact info
General Manager (IndiaAI Application Development), gm-appdev@indiaai.gov.in

The IndiaAI Application Development Initiative aims to support the development, scaling, and promotion of impactful AI solutions that address real-world challenges. It sources problem statements from central ministries, state departments, and relevant institutions, then invites AI researchers, innovators, and startups to build, test, and deploy solutions to drive large-scale socio-economic transformation in critical sectors.

IndiaAI Datasets Platform / AIKosh

Contact info
Chief Executive Officer, Digital India BHASHINI Division, ceo-dibd@digitalindia.gov.in

AIKosh functions as the dataset platform for the India AI Mission. It is designed to democratise access to high-quality, non-personal, and anonymised datasets and strengthen the national data required for indigenous model development and application deployment. As of September 2026, AIKosh hosts over 15,800 datasets and 358 sectoral models across 22 sectors.[95]

The platform is also designed to enable interoperability and ease of use through standardised metadata and API-based access features. A related public digital infrastructure is BHASHINI. It is created under the National Language Translation Mission (NLTM) to reduce language barriers in digital services through reusable AI tools for translation, speech-to-text, text-to-speech, transliteration, and multilingual access. BHASHINI supports text in 36 Indian languages and voice services in 23 Indian languages, as well as 35 international languages. It had processed more than 9 billion cumulative inferences and was handling over 24 million inferences each day. The platform was also integrated with more than 800 government websites [96].

[95] Ministry of Electronics and Information Technology, "AIKosh: Unified hub for datasets, models, and AI sandbox," INDIAai: The National AI Portal of India. [Online]. Available: https://aikosh.indiaai.gov.in/home. [Accessed: Sep. 20, 2026].

[96] Press Information Bureau, Government of India, "BHASHINI, Current AI and Kalpa Impact Conclude VYOMA Innovation Challenge, Showcase Open-Source AI Solutions for India," Press Information Bureau, Sep. 16, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2310855acIndia &reg=48&lang=2 [Accessed: Sep. 20, 2026].oss

IndiaAI Compute Capacity

Contact info
General Manager (IndiaAI compute capacity), gm-compute@indiaai.gov.in

Under the Compute pillar, the IndiaAI Mission is building a scalable AI compute ecosystem to serve startups, researchers, academia, and public-sector users through structured access mechanisms [97]. A subsidised national compute facility and subsidised access via the IndiaAI compute portal have onboarded over 45,000 GPUs as of Sep 2026 [98].

IndiaAI Startup Financing

Contact info
General Manager (Startups), IndiaAI, gm-startups@indiaai.gov.in

The Startup Financing pillar is designed to bridge funding gaps for AI startups by improving access to risk capital across the startup lifecycle, from prototyping to commercialisation, to accelerate deep-tech AI innovation and scale-up.

Under this pillar, the IndiaAI Startups Global programme was launched in partnership with Station F in Paris and HEC Paris. It is a four-month, funded acceleration programme for selected Indian AI startups that provides mentorship, investor access, and market-entry support in Europe. As per the DPIIT startup data, currently India has over 5,400 active AI startups working in different domains of AI [99] such as natural language processing (NLP), computer vision, data annotation and others.

IndiaAI FutureSkills

Contact info
General Manager, gm-futureskills@indiaai.gov.in

The IndiaAI FutureSkills pillar is the skilling and talent arm of the IndiaAI Mission. It focuses on building a national AI talent pipeline and widening access to AI education and practice. A key instrument under this pillar is the IndiaAI Fellowship, which supports students working on AI projects in undergraduate, postgraduate, and PhD programmes, and expands national labs such as AI Data Labs and IndiaAI Labs.

In school education, the Ministry of Education has released CBSE's Computational Thinking and Artificial Intelligence curriculum for Classes III to VIII [100].

[97] Ministry of Electronics and Information Technology, "IndiaAI compute capacity: Building a scalable AI ecosystem," INDIAai: The National AI Portal of India. [Online]. Available: https://compute.indiaai.gov.in/. [Accessed: Sep. 15, 2026].

[98] IndiaAI, Digital India Corporation, Ministry of Electronics and Information Technology, Government of India, "List of Empanelled GPU Providers and OEM Categories," IndiaAI Cloud Computing Portal, 2026. [Online]. Available: https://compute.indiaai.gov.in/files/empanelled-gpus.pdf. [Accessed: Sep. 25, 2026]

[99] The number is based on DPIIT data shared with office of PSA.

[100] Central Board of Secondary Education, "Computational thinking and artificial intelligence: Classes 3-8 curriculum," Ministry of Education, Government of India, 2026. [Online]. Available: https://cbseacademic.nic.in/web_material/CurriculumMain27/CTAI_Pri_2026-27.pdf.

At the higher education level, the government has established the Centre of Excellence in Artificial Intelligence for Education at IIT Madras, with a national mandate to develop responsible and scalable AI solutions for education [101].

IndiaAI–Meta Centre for Generative AI, Srijan at IIT Jodhpur, and the YuvAI initiative, developed with MeitY and AICTE, which aims to train 100,000 students and developers over three years in foundational large language model skills.As per the Stanford AI Index report 2026, AI talent concentration in India increased by 120% between 2019 and 2025 [102].

Safe & Trusted AI

Contact info
Prof. Balaraman Ravindran, Head of CeRAI, ravi@dsai.iitm.ac.in

The Safe & Trusted AI pillar is intended to put in place the guardrails so that AI systems are developed, deployed, and adopted in ways that are responsible, safe, and trustworthy across their lifecycle. The pillar supports responsible AI projects that build indigenous tools and frameworks for innovators, and it provides guidelines and governance frameworks to strengthen responsible AI practices in design, testing, deployment, and use.

As part of the Safe & Trusted AI pillar, the IndiaAI Safety Institute has been established as a dedicated institutional mechanism for AI safety and governance. It is designed as a hub-and-spoke network that works with academia, startups, industry, and government ministries/departments. The India AI Governance Guidelines give the AI Safety Institute a central role in India's AI governance framework[103]. AI Safety Institute (AISI) will serve as the primary body guiding the safe and trusted development and use of AI in India, with responsibilities for research, risk assessment, capacity building, testing and evaluation of AI systems, and providing technical advice to policymakers, regulators, and industry. It will also anchor India's participation in global AI governance forums, including collaboration through the International Network of AI Safety Institutes. The Centre for Responsible AI (CeRAI), IIT Madras, is a key collaborating institution for the Safe and Trusted AI pillar.

[101] Ministry of Education, "Bodhan.AI: Centre of excellence in AI for education, IIT Madras." [Online]. Available: http://bodhan.ai. [Accessed: Apr. 15, 2026].

[102] Stanford Institute for Human-Centred Artificial Intelligence (HAI), Stanford University, "Artificial Intelligence Index Report 2026," Stanford, CA, USA, 2026. [Online]. Available: https://hai.stanford.edu/assets/files/ai_index_report_2026.pdf.

[103] Ministry of Electronics and Information Technology, "India AI governance guidelines: Enabling safe and trusted AI innovation," Government of India, Nov. 5, 2025. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/nov/doc2025115685601.pdf

In addition to the seven-pillar architecture of the IndiaAI mission, the Indian AI ecosystem also includes Artificial Intelligence Centres of Excellence (AI-CoEs) [104]. The government has approved three CoEs in healthcare, agriculture, and sustainable cities. These centres are led by AIIMS and IIT Delhi for healthcare, IIT Ropar for agriculture, and IIT Kanpur for sustainable cities. These centres are structured as national consortia, bringing together academia, industry, and startups to undertake interdisciplinary research and develop deployable AI solutions for high-impact sectors. The Indian Union Budget 2025-26 announces the fourth CoE for education [105]. It is intended to strengthen the use of AI adoption in education, improving teaching and learning methods and supporting the development of a future-ready workforce in line with the National Education Policy (NEP) 2020.

Centre of Excellence	Institution	Name	Designation	Email
Centre of Excellence for AI in Healthcare	IIT Delhi	Prof. Chetan Arora	Chief Project Manager	chetan@cse.iitd.ac.in
	AIIMS Delhi	Prof. Krithika Rangarajan	Chief Project Manager	krithikarangarajan@aiims.edu
Centre of Excellence for AI in Agriculture	IIT Ropar	Prof. Pushpendra P. Singh	Project Director	pps@iitrpr.ac.in
Centre of Excellence (AI-CoE) for Sustainable Cities	IIT Kanpur	Prof. Sachchida Nand Tripathi	Project Director and Head	snt@iitk.ac.in

Table 1: Centre of Excellence in AI

Relevant Documents

India AI Governance Guidelines report: It was released on 5 November 2025 by the Ministry of Electronics & Information Technology (MeitY) of the Government of India. The guidelines provide a principle-based national framework for responsible AI. It covers governance pillars, recommended institutional mechanisms, and an implementation roadmap to enable safe and trustworthy AI adoption across sectors [106].

White Paper Series: Democratising Access to AI Infrastructure: It was released on December 29, 2025, by the Office of the Principal Scientific Adviser (OPSA) to the Government of India (GOI). It sets out a policy case for treating essential components of AI (such as compute, data, and related infrastructure) as shared enablers to broaden access for

[104] Press Information Bureau, "Shri Dharmendra Pradhan announces 3 centres of excellence in AI in healthcare, agriculture and sustainable cities," Ministry of Education, Government of India, Oct. 15, 2024. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2064990&reg=3&lang=2

[105] Ministry of Electronics and Information Technology, "Union Budget 2025-26: Centre allocates ₹500 crore for AI Centre of Excellence in Education," INDIAai: The National AI Portal of India, Feb. 1, 2025. [Online]. Available: https://indiaai.gov.in/news/union-budget-2025-26-centre-allocates-500-crore-for-ai-centre-of-excellence-in-education

[106] Ministry of Electronics and Information Technology, "India AI governance guidelines: Enabling safe and trusted AI innovation," Government of India, Nov. 5, 2025. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/nov/doc2025115685601.pdf

startups, researchers, and public institutions and reduce the concentration of capability[107]. In this series, the second white paper released by the Office of the Principal Scientific Adviser to the GOI is Strengthening AI Governance Through Techno-Legal Frameworks. It was released on 23 January 2026. It outlines a techno-legal approach that combines baseline legal safeguards, sector-specific regulation, technical controls, and institutional mechanisms to manage AI risks while remaining pro-innovation [108].

AI for Inclusive Societal Development: This document was released by NITI Aayog on 8 October 2025. The report focuses on how AI and frontier technologies can be applied to improve the lives and livelihoods of India's informal workforce and proposes policy directions to enable inclusive adoption with safeguards for rights, safety, and trust [109].

AI Impact Summit Declaration: It was adopted at the AI Impact Summit in New Delhi on 18-19 February 2026 and published as an official outcome document. The Declaration sets out a shared direction for collaborative, trusted, and resilient AI and records broad international support for common principles and mechanisms for cooperation. The Declaration has been endorsed by 91 countries and international organisations [110].

International Outlook

IndiaAI Mission is positioned within a broader multilateral AI landscape. The recent India AI Impact Summit (February 2026) and the New Delhi Declaration on AI Impact have set a direction for advancing shared work on trusted, resilient, sustainable, and inclusive AI, particularly in areas such as governance, safety, evaluation, and public-interest deployment. India's role in convening these processes reflects a growing capacity to shape agendas on AI policy and implementation. The mission provides scope for deeper engagement through Global Partnership on Artificial Intelligence (GPAI), the UNESCO AI Readiness Assessment process, and structured partnerships across technology, research, and public systems. The Indian AI ecosystem is open to continued engagement among government, industry, experts, and civil society, particularly as AI systems evolve rapidly and shape multiple areas of public and economic life. IndiaAI also supports this direction through structured partnerships with global technology companies to strengthen skilling, innovation, datasets, and responsible AI practices.

[107] Office of the Principal Scientific Adviser to the Government of India, "Democratising access to AI infrastructure," India's AI Policy Priorities White Paper Series, ver. 3.0, Dec. 29, 2025. [Online]. Available: https://psa.gov.in/CMS/web/sites/default/files/publication/WP_Democratising%20Access_V3.0_29122025A.pdf.

[108] Office of the Principal Scientific Adviser to the Government of India, "Strengthening AI governance through techno-legal framework," Emerging Policy Priorities for India's AI Ecosystem White Paper Series, no. 2, Jan. 23, 2026. [Online]. Available: https://psa.gov.in/CMS/web/sites/default/files/publication/AI-WP_TechnoLegal.pdf.

[109] NITI Frontier Tech Hub, NITI Aayog, "AI for inclusive societal development," Sep. 2025. [Online]. Available: https://niti.gov.in/sites/default/files/2025-10/Roadmap_On_AI_for_Inclusive_Societal_Development.pdf.

[110] Ministry of External Affairs, Government of India, "AI Impact Summit Declaration, New Delhi (February 18–19, 2026)," Feb. 21, 2026. [Online]. Available: https://www.mea.gov.in/bilateral-documents.htm?dtl/40809.

II. National Quantum Mission

The National Quantum Mission (NQM), approved on 19th April 2023, is the flagship mission for the development of the quantum science and technology ecosystem in the country. The mission is anchored by the Department of Science and Technology. For NQM, a separate coordinating agency, the Mission Coordination Cell (MCC), has also been established and works with the Mission Secretariat at DST.

Point of Contact
Mission Director and Head of QTC (Quantum Technology Cell), jbvreddy@nic.in

URL
https://dst.gov.in/national-quantum-mission-nqm

Budget

The mission has a financial outlay of ₹ 6,003.65 crore (~ US$ 740M) over eight years from FY 2023-24 to FY 2030-31 [111]. Under the mission, private investment is being promoted through a blended funding model to crowd in venture capital and startup-led technology development. For example, QpiAI, a Bengaluru-based quantum computing startup supported under NQM, developed QpiAI-Indus, a 25-qubit full-stack quantum computer, and later raised US$32 million (~ ₹ 279 crore) in Series A funding co-led by Avataar Ventures and the National Quantum Mission, with participation from existing and new investors.[112] Similarly, QNu Labs, which is also supported under NQM, raised US$7 million (~ ₹ 60 crore) in a Series A with participation from private investors[113].

Priorities

The key priorities of the mission span across increasing the compute capacity of quantum computers, designing and synthesising quantum materials such as superconductors, establishing a multinode quantum network with quantum memories, and developing satellite-based secure quantum communications [114].

[111] Department of Science & Technology, "National Quantum Mission (NQM)." [Online]. Available: https://dst.gov.in/national-quantum-mission-nqm?utm. [Accessed: Mar. 3, 2026].

[112] The Quantum Insider, "QpiAI raises 32 million USD (₹ 279 cr) in Series A round led by Avataar Ventures and National Quantum Mission," Jul. 17, 2025. [Online]. Available: https://thequantuminsider.com/2025/07/17/qpiai-raises-32-million-usd-inr-279-cr-in-series-a-round-led-by-avataar-ventures-and-national-quantum-mission/.

[113] The Quantum Insider, "QNu Labs raises over $7M in funding led by India's National Quantum Mission," Apr. 30, 2025. [Online]. Available: https://thequantuminsider.com/2025/04/30/qnu-labs-raises-over-7m-in-funding-led-by-indias-national-quantum-mission/

[114] Department of Science & Technology, "National Quantum Mission (NQM)." [Online]. Available: https://dst.gov.in/national-quantum-mission-nqm?utm. [Accessed: Mar. 3, 2026].

Implementation and Functional Architecture

The mission's architecture is divided into four thematic domains, often referred to as "T-Hub." These T-Hubs are located within predefined host institutions, with each host institution responsible for one technological vertical. The table below lists the host institution and the technology vertical, along with their PoC details for reference[115]

S. No	Technology Vertical	Host Institute	Total amount	Point of Contact Details
1	Quantum Computing	IISc Bengaluru	₹ 653.13 crore	Chief Executive Officer, QC Innovation (ceo@qcinnovation.co.in)
2	Quantum Communication	IIT Madras in association with C-DoT, New Delhi	₹ 614.31 crore	Chief Executive Officer, Samgnya Technologies (ceo@samgnya.in)
3	Quantum Sensing and Metrology	IIT Bombay	₹ 714.76 crore	Chief Executive Officer, QmetTech (ceo@qmettech.com)
4	Quantum Material and Devices	IIT Delhi	₹ 348.49 crore	Chief Executive Officer, QMD Hub (ceo@qmdhub.co.in)

Table 2: Host institution and the Quantum technology vertical

The highest sanctioned vertical is Quantum Sensing & Metrology, followed by Quantum Computing and Quantum Communication. In addition to these T-Hubs, the mission's functional architecture includes components focused on startup support and capacity building.

a. Quantum Computing Thematic Hub

The objective of the hub is to develop intermediate-scale quantum computers with 20-50 physical qubits (3 years), 50-100 physical qubits (5 years) and 50-1000 physical qubits (8 years) in various platforms like superconducting and photonic technology.[116] Technical Groups under Quantum Computing T-Hub:

S.No.	Technical Group	Point of Contact Details
1	Photonics quantum processor development	Lead Investigator, shankarks@iisc.ac.in
2	Quantum computers with superconducting qubits	Lead Investigator, r.vijay@tifr.res.in
3	Programmable photonic quantum computing using qubits encoded in different degrees of freedom of a photon	Lead Investigator, chandracm@iisc.ac.in
4	Design and Demonstration of a Highly Scalable Quantum Computer using Semiconducting Qubits	Lead Investigator, adixit@ee.iitd.ac.in
5	Development of a 50-qubit quantum information processor with electron spins in silicon	Lead Investigator, suddho@phy.iitb.ac.in
6	Quantum Computing with Neutral Atoms, Trapped Ions and Related Hybrid Systems	Lead Investigator, srishic@rri.res.in

Table 3: Technical Groups under Quantum Computing T-Hub

[115] Sansad, "National Quantum Mission." [Online]. Available: https://sansad.in/getFile/loksabhaquestions/annex/186/AU499_H7srwl.pdf?source=pqals&utm. [Accessed: Mar. 7, 2026].

[116] Office of the Principal Scientific Adviser to the Government of India, "International Technology Engagement Strategy (ITES)," Apr. 2025. [Online]. Available: https://www.psa.gov.in/CMS/web/sites/default/files/publication/ITES_QWEBSITE1.pdf.

The Quantum Computing T-hub achieved several breakthroughs in 2025. Details of these research highlights can be accessed from https://qcinnovation.co.in/research-highlights/

b. Quantum Communication Thematic Hub

The hub has three objectives:

- Develop satellite-based secure quantum communications between two ground stations over a range of 2000 kilometres within India, as well as long-distance secure quantum communications with other countries.
- Develop inter-city quantum key distribution over 2000 km with trusted nodes using wavelength division multiplexing on existing optical fibre.
- Develop a multi-node Quantum network with quantum memories, entanglement swapping and synchronised quantum repeaters at each node (2-3 nodes) [117].

The Quantum Communication T-Hub has five technical groups:

S.No.	Technical Group	Point of Contact Details
1	QuiLA (Quantum Internet with Local Access)	Lead Investigator, anilpr@ee.iitm.ac.in
2	PIPETA (Post-Quantum IP Encryptor and TLS Accelerator)	Lead Investigator, dgaur@cdot.in
3	TAHQEECAT (Hybrid Quantum Secure Communication Networks)	Lead Investigator, bkanseri@physics.iitd.ac.in
4	QuEPRAN (Quantum Entanglement Photonic Repeater Network)	Lead Investigator, usinha@rri.res.in
5	SBQKD (Satellite-Based Quantum Key Distribution)	Lead Investigator, director@sac.isro.gov.in

Table 4: Technical Groups under Quantum Communication T-Hub

c. Quantum Sensing and Metrology Thematic Hub

The hub focuses on the development of magnetometers with 1 femto-Tesla/sqrt (Hz) sensitivity in atomic systems and better than 1 pico-Tesla/sqrt (Hz) sensitivity in nitrogen vacancy centres; gravity measurements having sensitivity better than 100 nanometres/second² using atoms; and atomic clocks with 10-19 fractional instability for precision timing, communications and navigation [118].

[117] Office of the Principal Scientific Adviser to the Government of India, "International Technology Engagement Strategy (ITES)," Apr. 2025. [Online]. Available: https://www.psa.gov.in/CMS/web/sites/default/files/publication/ITES_QWEBSITE1.pdf.

[118] Office of the Principal Scientific Adviser to the Government of India, "International Technology Engagement Strategy (ITES)," Apr. 2025. [Online]. Available: https://www.psa.gov.in/CMS/web/sites/default/files/publication/ITES_QWEBSITE1.pdf.

The Qmet Tech Foundation has three technical groups:

S.No.	Technical Group	Point of Contact Details
1	Design and development of advanced imaging and microscopy systems based on harnessing the quantum correlation of entangled photons	Lead Investigator, akjha@iitk.ac.in
2	Developing field-ready hybrid magnetometers and sensors	Lead Investigator, gsaikat@iitk.ac.in
3	NV centre diamond-based quantum sensing and microscopy systems.	Lead Investigator, kasturis@ee.iitb.ac.in

Table 5: Technical groups- Qmet Tech Foundation

The patent highlights of the hub can be accessed from https://qmettech.com/patents/, showcasing the innovation produced.

d. Quantum Material and Devices Thematic Hub

The hub is responsible for developing quantum device technologies, such as superconductors, topological materials for qubit fabrication, entangled-photon sources, and quantum-sensing devices for applications in computing and communication. To develop these technologies, the hub focuses on establishing national-level fabrication and testing units, advanced materials design and engineering, and industrial collaboration to assess test readiness [119]. Qmdhub has three technical groups:

S.No.	Technical Group	Point of Contact Details
1	Development of on-demand single photon emitters, single photon avalanche detectors, high-frequency devices and nanowire quantum devices utilising GaAs and InP-based epitaxial semiconductors	Lead Investigator, rsingh@physics.iitd.ac.in
2	2D Materials for Photonic Quantum Technologies	Lead Investigator, saurabh.lodha@gmail.com
3	Design and development of various individual building blocks of quantum photonic circuits (QPC) and their testing and validation	Lead Investigator, skvarshney@ece.iitkgp.ernet.in

Table 6: Technical groups- Qmdhub

e. Startup Support under NQM

The support for startups under the mission is provided through the four thematic hubs. These hubs provide support to startups from the ideation stage to eventual commercialisation. In addition to guidance and mentorship, financial support is provided under the mission.

[119] Office of the Principal Scientific Adviser to the Government of India, "International Technology Engagement Strategy (ITES)," Apr. 2025. [Online]. Available: https://www.psa.gov.in/CMS/web/sites/default/files/publication/ITES_QWEBSITE1.pdf.

The official funding structure has two broad tracks: for early-stage startups, a seed support of up to ₹ 5 crores is available ; for startups that already have one or more rounds of VC funding, support of up to ₹ 25 crore is provided. As of 2026, the mission has supported 26 startups [120].

Relevant Documents

National Quantum Mission Vision and Implementation Document: The document provides an overview of the objectives, implementation strategy, funding procedures, and initiatives under the mission. It explains how thematic hubs function and the hub-spoke-spike model[121].

Guidelines for supporting startups under NQM: The guidelines mention the eligibility criteria for startups to access support under the NQM. It states that the startup must be DPIIT-registered, have a product with market fit, and have technology as its core component[122].

Implementation of the Quantum Safety Ecosystem in India: The report identifies emerging threats from advancements in quantum computing and the need for quantum-safe security. It mentions country-specific efforts towards quantum-safe security[123].

Military Quantum Mission Policy Framework: The framework was released in January 2026 as a roadmap to implement quantum technologies within the armed forces. The framework inculcates the four pillars of NQM to develop cutting-edge technologies for defence applications [124].

State of Progress in India's Quantum STI Ecosystem: The paper elucidates key insights into India's Quantum STI Ecosystem and assesses it across knowledge, innovation, industrial strength, global engagement and major milestones achieved[125].

[120] Ministry of Science & Technology, Government of India, "India's emerging quantum ecosystem strengthened by enabling policy of the Modi government: Dr Jitendra Singh," Press Information Bureau, Press Release ID: 2317241, Sep. 30, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2317241&reg=48&lang=2 [Accessed: Oct. 15, 2026].

[121] Press Information Bureau, "National Quantum Mission: India's Quantum Leap," Mar. 17, 2025. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/mar/doc2025318521601.pdf?utm

[122] Department of Science & Technology, "Guidelines for supporting start-ups under the National Quantum Mission." [Online]. Available: https://dst.gov.in/sites/default/files/Guidelines%20to%20support%20start-ups.pdf?utm. [Accessed: Mar. 10, 2026].

[123] Department of Science & Technology, "Implementation of Quantum Safe Ecosystem in India: Report of the Task Force," Feb. 2026. [Online]. Available: https://dst.gov.in/sites/default/files/Report_TaskForce_PQMigration_4Feb26%20%28v1%29.pdf?utm.

[124] Press Information Bureau, "CDS releases Military Quantum Mission Policy Framework," Jan. 22, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2217374&reg=3&lang=2&utm.

[125] A. Bhasin, J. B. V. Reddy, S. Kalyani, A. Mishra, and S. Dang, State of Progress in India's Quantum STI Ecosystem. New Delhi, India: Office of the Principal Scientific Adviser to the Government of India and Department of Science and Technology, Sep. 2026. [Online]. Available: https://psa.gov.in/CMS/web/sites/default/files/publication/27-sep-quantum-paper-updated.pdf. [Accessed: Oct. 15, 2026].

International Technology Engagement Strategy for Quantum (ITES-Quantum): The International Technology Engagement Strategy for Quantum, released by the Office of the Principal Scientific Adviser on World Quantum Day 2025, is a strategy dossier that analyses the quantum ecosystem of the country on the global and national levels through scientometric indicators, while also analysing gaps in the Indian quantum ecosystem [126].

International Outlook

The National Quantum Mission prioritises international engagements and collaborations to build partnerships for academic exchange and to advance research and development across different quantum technologies. The mission has an embedded international vision, reflected in objectives such as achieving secure quantum communications with other countries,[127] positioning India as a serious node in the global quantum ecosystem. With NQM in place, India has already established dedicated thematic hubs (focusing on technology development and R&D), along with enabling startups focusing on critical technologies to deliver products for commercialisation.

- Existing international engagements such as the US-India TRUST initiative, the EU-India TTC (Working Group 1), and the India-UK TSI partnership are all partnerships focused on knowledge sharing, commercialisation and startup linkages and co-development of technologies to establish a collaborative roadmap for advancement [128].

- To promote academic collaborations, the Department of Science and Technology and the Ministry of External Affairs have launched an exchange portal for international students, postdocs, and researchers to conduct quantum technology research in India, in line with the multinational Quantum Entanglement Exchange Programme (QEE) [129].

These partnerships show that India is actively involved in the global quantum community. By working with international partners on both academic exchange and technology development, India is building strong expertise, supporting startups, and creating business opportunities. These steps lay the groundwork for more international collaborations to help India grow its quantum capabilities.

[126] Office of the Principal Scientific Adviser to the Government of India, "International Technology Engagement Strategy (ITES)," Apr. 2025. [Online]. Available: https://www.psa.gov.in/CMS/web/sites/default/files/publication/ITES_QWEBSITE1.pdf.

[127] Department of Science & Technology, "National Quantum Mission (NQM)." [Online]. Available: https://dst.gov.in/national-quantum-mission-nqm?utm. [Accessed: Mar. 3, 2026].

[128] European Commission, "First EU-India Trade and Technology Council focused on deepening strategic engagement on trade and technology." [Online]. Available: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_23_2728/IP_23_2728_EN.pdf?. [Accessed: Mar. 7, 2026]. Office of the Principal Scientific Adviser to the Government of India, "Initiative on Critical and Emerging Technologies (iCET)." [Online]. Available: https://www.psa.gov.in/icet. Ministry of External Affairs, "The UK-India Technology Security Initiative," Jul. 24, 2024. [Online]. Available: https://www.mea.gov.in/bilateral-documents.htm?dtl%2F37995%2FThe_UKIndia_Technology_Security_Initiative&utm.

[129] Department of Science & Technology, "Quantum Entanglement Exchange Programme." [Online]. Available: https://dst.gov.in/quantum-entanglement-exchange-programme?utm. [Accessed: Mar. 7, 2026].

III. Mission on Interdisciplinary Cyber-Physical Systems

The National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) is implemented by the Department of Science and Technology (DST), Ministry of Science and Technology, Government of India. It was approved in 2018 [130].

Point of Contact
Head, Frontier and Futuristic Technologies (FFT) Division, DST,
ekta.kapoor@nic.in.

URL
https://nmicps.gov.in/

Budget

The mission was approved with a total outlay of ₹ 3,660 crore (~US$ 396.7M) over five years, with expenditure spread over nine years. The mission's active period was later extended by four years, ending in December 2027 (2018-2027) [131].

The NM-ICPS hubs are not designed as purely grant-funded institutions. They follow a phased hybrid funding model, in which initial capacity building is largely supported by the Government of India through DST and, in some cases, by the state governments where these hubs are located. The hubs are expected to gradually build financial autonomy through commercialisation, corporate partnerships, startup incubation, training, and industry-led projects.

For example, ARTPARK, IISc (I-HUB for Robotics), initially built through public seed funding from DST (Govt of India) and the Govt of Karnataka, while its ongoing support for startups comes through project grants, corporate partnerships, incubation support, and venture-linked financing. This makes ARTPARK more of a venture builder and innovation platform than a traditional startup fund.

Priorities

The NM-ICPS is a long-term national mission designed to build India's capabilities in advanced cyber-physical systems through a sustained focus on research, technology development, innovation, and skill creation. Over its period, it has aimed to move from research to application by supporting technologies and solutions aligned with national priorities.

[130] Department of Science & Technology, "National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS)," Ministry of Science and Technology, Government of India, Apr. 28, 2025. [Online]. Available: https://dst.gov.in/national-mission-interdisciplinary-cyber-physical-systems-nm-icps.

[131] Department of Science & Technology, "Mission Management," National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS). [Online]. Available: https://nmicps.gov.in/management. [Accessed: Mar. 15, 2026].

The major priorities of the mission are:

- To promote translational research in cyber-physical systems.
- Develop technologies, prototypes, and applications aligned with national needs and strategic priorities.
- Strengthen high-end human resource development and build advanced skills in emerging technologies.
- Support innovation, entrepreneurship, and startup growth in CPS domains.
- Establish interdisciplinary centres of excellence in leading institutions, and it is now operational in 25 top institutes of India.
- Build national capability in key technology areas such as artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), Internet of Everything (IoE), data analytics, robotics and autonomous systems, cybersecurity and quantum technologies.

Implementation and Functional Architecture

The mission is implemented through a distributed hub-based architecture. Under NM-ICPS, 25 Technology Innovation Hubs (TIHs) have been established in top institutions across the country.

Each TIH is set up as a Section 8 company within its host institution. They are assigned to distinct technology verticals in advanced areas such as AI and machine learning, robotics, cybersecurity, data analytics and predictive technologies, intelligent collaborative systems, agricultural and water technologies, mining technologies, advanced communication systems, and quantum technologies. The mission's implementation is organised around four major activity categories:

(1) technology development;

(2) human resources and skill development;

(3) innovation, entrepreneurship, and start-up ecosystems; and

(4) international collaborations.

Each hub follows a technology lifecycle approach that covers knowledge, development, translation, and commercialisation, so that research outputs can be moved toward deployable and marketable products [132].

[132] Department of Science & Technology, "National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS)." [Online]. Available: https://nmicps.gov.in/. [Accessed: Mar. 15, 2026].

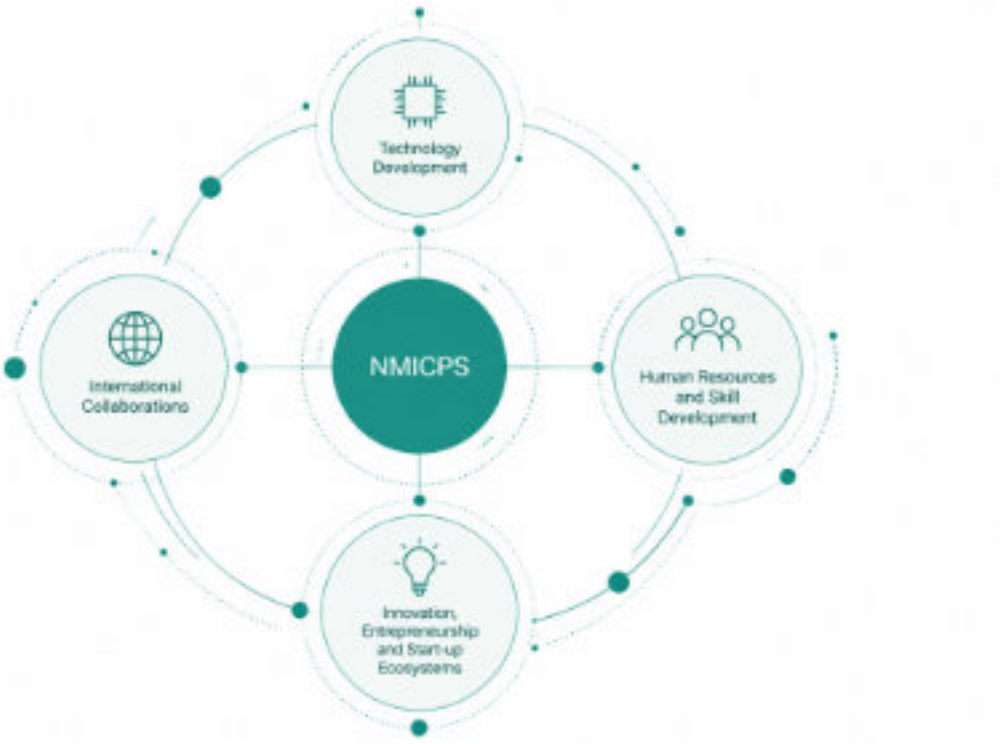


Fig 1: Major activities of NM-ICPS

The mission is supported by a central management structure comprising the Mission Governing Board, Scientific Advisory Committee, Interministerial Coordination Committee, and the mission office. This provides an institutional framework for strategic direction, expert review, interdepartmental coordination, and operational oversight across the 25 hubs.

The mission is showing measurable outcomes across its four implementation areas. Under technology development, the hubs have developed 297 technologies and technology products with TRL greater than 7, of which 112 have been commercialised. The mission has also granted 2,371 fellowships, conducted 441 training programmes, and trained 37,035 participants. In terms of entrepreneurship development, the hubs have incubated over 1,130 startups, while there are 41 collaborations with foreign institutions. These outcomes demonstrate that NM-ICPS is contributing to technology translation, commercialisation, skilling, start-up development, and global collaboration.[133]

As of August 2026, the 25 TIHs had collectively supported the development of more than 1,100 technologies and 1,300 technology products [134].

[133] Ministry of Science & Technology, "Parliament question: Progress under NM-ICPS," Press Information Bureau, Government of India, Press Release ID: 2223739, Feb. 5, 2026. [Online]. Available: https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2223739&reg=3&lang=2.

[134] Ministry of Science & Technology, "Parliament question: Progress under NM-ICPS," Press Information Bureau, Government of India, Press Release ID: 2298221, Aug. 12, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2298221&reg=48&lang=2.

Technology Translation Research Parks (TTRPs)

As a next phase of the mission, four high-performing Technology Innovation Hubs were upgraded during 2025-26 into Technology Translation Research Parks (TTRPs) to strengthen technology translation and commercialisation. These are:

1. I-HUB for Robotics and Autonomous Systems Innovation Foundation, IISc Bengaluru – Robotics & AI Systems;
2. IHUB NTIHAC Foundation, IIT Kanpur – Cybersecurity;
3. Technology Innovation in Exploration & Mining Foundation, IIT (ISM) Dhanbad – Mining technologies, from exploration to beneficiation of minerals;
4. IITI Drishti CPS Foundation, IIT Indore – Digital Healthcare.

The list of 25 hubs and their point of contact details:

Hub Name	Institute	Technology Vertical	Leadership Chief Executive Officer (CEO) & Project Director (PD)	Contact (CEO & PD)
I-HUB for Robotics	IISc Bengaluru	Robotics & Autonomous Systems	PD: Prof. Bharadwaj Amrutur	PD: amrutur@iisc.ac.in
IITI Drishti CPS	IIT Indore	System Simulation & Modelling	PD: Prof. Anand I. Palani	CEO: ceo@drishticps.iiti.ac.in PD: palaniia@iiti.ac.in
TEXMiN	IIT (ISM) Dhanbad	Technologies for Mining	CEO: Shri Suraj Prakash PD: Prof. Dheeraj Kumar	CEO: ceo@texmin.in PD: dheeraj@iitism.ac.in
C3iHub	IIT Kanpur	Cyber Security	CEO: Dr. Tanima Hajra PD: Prof. Somitra K. Sanadhya	CEO: tanima@c3ihub.org PD: somitra@iitk.ac.in
IITM Pravartak	IIT Madras	Sensors, Networking & Controls	CEO: Dr. M. J. Shankar Raman PD: Prof. David Koilpillai	CEO: mjsraman@pravartak.org.in PD: davidk@ee.iitm.ac.in
BITS BioCyTiH	BITS Pilani	Bio-CPS	CEO: Dr. Anil Wali PD: Prof. Sunil Bhand	CEO: ceo@biocytih.co.in PD: sunilbhand@goa.bits-pilani.ac.in
DivyaSampark	IIT Roorkee	Device Tech & Materials	CEO: Mr. Manish Anand PD: Prof. Sudeb Dasgupta	CEO: manish.anand@tih.iitr.ac.in PD: sudeb.dasgupta@ece.iitr.ac.in
I-DAPT-HUB	IIT BHU Varanasi	Data Analytics	CEO: Mr. G. S. Rawat PD: Prof. Ram Sharan Singh	CEO: ceo.idapt@iitbhu.ac.in PD: projectdirector.idapt@iitbhu.ac.in

Hub Name	Institute	Technology Vertical	Leadership Chief Executive Officer (CEO) & Project Director (PD)	Contact (CEO & PD)
IDEAS	ISI Kolkata	Data Science & Big Data	CEO: Mr. Agnimitra Biswas PD: Prof. Dipti Prasad Mukherjee	CEO: ceo@ideas-tih.org PD: dipti@isical.ac.in
IHub Anubhuti	IIIT Delhi	Cognitive Computing	CEO: Mr. Rajeev Goel PD: Prof. Pushpendra Singh	CEO: rajeev@anubhuti.tech PD: psingh@iiitd.ac.in
TIH Drishti	IIT Jodhpur	Computer Vision, AR/VR	CEO: - PD: Prof. Gaurav Bhatnagar	CEO: ceo@ihub-drishti.ai PD: project-director@ihub-drishti.ai
IHFC (Cobotics)	IIT Delhi	Cobotics	CEO: Shri Ashutosh D. Sharma PD: Dr. S.K. Saha	CEO: ceo@ihfc.co.in PD: saha@mech.iitd.ac.in
I-Hub Quantum	IISER Pune	Quantum Technologies	PD: Dr. Sunil Nair	CEO: ceo@quantech.org.in PD: sunil@iiserpune.ac.in
IIITB COMET	IIIT Bengaluru	Advanced Communication	CEO: Mr. Sridhar Pillalamarri PD: Prof. Debabrata Das	CEO: sridhar.p@iiitb.ac.in PD: ddas@iiitb.ac.in
IHub-Data	IIIT Hyderabad	Data Banks & Services	CEO: Dr. Jay Mookherje PD: Dr. U. Deva Priyakumar	CEO: ceo@ihub-data.iiit.ac.in PD: deva@iiit.ac.in
IBITF	IIT Bhilai	Fintech	CEO: Mr. Prashant Mathur PD: Dr. Santosh Biswas	CEO: ceo@ibitf.co.in PD: sb@iitbhilai.ac.in
IITG TIDF	IIT Guwahati	Underwater Exploration	CEO: Mr. Narendra N. Dutta PD: Prof. S.K. Dwivedy	CEO: ceo.tidf@iitg.ac.in PD: dwivedy@iitg.ac.in
AI4ICPS	IIT Kharagpur	AI and Machine Learning	CEO: Mr. Dipyaman Banerjee PD: Prof. Prabir Kumar Biswas	CEO: ceo@ai4icps.in PD: pkb@ece.iitkgp.ac.in
IIT Mandi iHub	IIT Mandi	Human-Computer Interaction	CEO: Shri Somjit Amrit PD: Prof. Shubhajit Roy Chowdhury	CEO: ceo@ihub.iitmandi.ac.in PD: shubhajit@iitmandi.ac.in
IPTIF	IIT Palakkad	Intelligent Collaborative Systems	CEO: Dr. Saishyam Narayanan PD: Dr. Vijay Muralidharan	CEO: saishyam@iptif.tech PD: vijay@iitpkd.ac.in
Vishlesan I-Hub	IIT Patna	Speech, Video & Text Analytics	CEO: Dr. Sai Kiran Oruganti PD: Dr. Anup Keshri	CEO: ceo.tih@iitp.ac.in PD: anup@iitp.ac.in
AWaDH	IIT Ropar	Agriculture & Water	CEO: Dr. Radhika Trikha PD: Dr. Pushpendra P. Singh	CEO: radhika.trikha@iitrpr.ac.in PD: pps@iitrpr.ac.in

Hub Name	Institute	Technology Vertical	Leadership Chief Executive Officer (CEO) & Project Director (PD)	Contact (CEO & PD)
Navavishkar	IIT Tirupati	Positioning & Precision Tech	CEO: Maj. Gen. M. Rajendran (Retd.) PD: Dr. Roshan Srivastav	CEO:ceo@navavishkar.iittp.ac.in PD: roshan@iittp.ac.in
TiHAN	IIT Hyderabad	Autonomous Navigation	CEO: Dr. D. Santhosh Reddy PD: Prof. P. Rajalakshmi	CEO: ceo.tihan@iith.ac.in PD: raji@ee.iith.ac.in
TIH-IoT	IIT Bombay	IoT & IoE	CEO: Mr. Kiran Shesh PD: Prof. Leena Vachhani	CEO: ceo@tih.iitb.ac.in PD: leena@sc.iitb.ac.in

Table 7: List of 25 hubs and their point of contact details

Relevant Documents

NM-ICPS Brochure: It is a summary document of the NM-ICPS. It outlines the technology area, highlights its role in supporting research, translation, innovation, and commercialisation, and presents the 25 Technology Innovation Hubs as the core implementation mechanism across domains [135].

NM-ICPS Quarterly Bulletin (Oct-Dec 2025): It summarises the mission structure and objectives and presents hub-wise progress across technology development, entrepreneurship, human resource development, and international collaborations. It is a useful reference for understanding the mission's latest operational progress and technology translation activities [136].

International Outlook

The mission includes strengthening international collaborative research and treats international collaboration as one of its four major activity areas. NM-ICPS is intended not only as a domestic technology mission but also as a platform for global knowledge exchange and joint research. The mission's hubs are actively engaging with several research institutions in countries such as the US, the Netherlands, France, Germany, and Russia to develop technology and share research.

The mission is designed to provide cross-border research linkages, creating space for the next phase to focus on areas such as artificial intelligence, advanced wireless systems, autonomous systems, health technologies, agriculture, robotics, cobotics, and smart cities.

[135] Department of Science & Technology, "National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS)," Ministry of Science and Technology, Government of India, Brochure. [Online]. Available: https://dst.gov.in/sites/default/files/brochure.pdf. [Accessed: Mar. 15, 2026].

[136] Department of Science & Technology, "National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS Quarterly Bulletein oct-Dec 2025)," Ministry of Science and Technology. Available: https://ihub-drishti.ai/images/pdf/Bulletin-Oct-Dec-2025.pdf.

IV. India Semiconductor Mission

Point of Contact
Chief Executive Officer, Indian Semiconductor Mission, ceo@ism.gov.in.

URL
https://ism.gov.in/

The India Semiconductor Mission (ISM) is a national initiative anchored by the Ministry of Electronics and Information Technology (MeitY), Government of India. It is implemented through the India Semiconductor Mission, which is an independent business division under the Digital India Corporation (DIC). It acts as the nodal agency for the mission [137]. ISM 1.0 was launched under the Semicon India Program in December 2021 to establish a foundational semiconductor and display ecosystem in India through fiscal support for manufacturing, packaging, and design.

Building on the progress of the first phase, ISM 2.0 is announced. This phase shifts attention toward deeper ecosystem capabilities, especially semiconductor equipment and materials, full-stack Indian semiconductor intellectual property, supply chains, and R&D centres [138].

Budget

The mission was approved with a total outlay of ₹ 76,000 crore (~US$ 10B). The scheme framework provides support over a multi-year period, including up to 6 years for major manufacturing schemes and 5 years for the Design Linked Incentive (DLI) scheme [139].

For ISM 2.0, the Union Cabinet approved a total outlay of ₹ 1,27,500 crore in July 2026 [140].

Alongside public support, India's semiconductor ecosystem is also attracting large industry-led investments under government-supported schemes. Under the ISM, 12 projects have been approved with a cumulative investment of around ₹ 1.64 lakh crore (~ US$ 17B) [141].

[137] India Semiconductor Mission, "Home," Digital India Corporation, Ministry of Electronics and Information Technology, Government of India. [Online]. Available: https://ism.gov.in/. [Accessed: Mar. 17, 2026].

[138] Press Information Bureau, "Budget 2026-27 announces the launch of India Semiconductor Mission (ISM) 2.0." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2221522&reg=3&lang=1&utm. [Accessed: Mar. 16, 2026].

[139] Press Information Bureau, ".76000 crore (>10 billion USD) approved for development of semiconductors and display manufacturing ecosystem in India." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1781724&reg=3&lang=2&u. [Accessed: Mar. 16, 2026].

[140] Press Information Bureau, "India Semiconductor Mission 2.0," Jul. 15, 2026. [Online]. Available: https://d2p5j06zete1i7.cloudfront.net/Cms/admin/PressRelease/1784110792.pdf.

[141] Ministry of Electronics & IT, "Cabinet approves two more semiconductor manufacturing units with cumulative investment of more than . 3,900 crore," Press Information Bureau, Government of India, Press Release ID: 2258119, May 5, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2258119&lang=1&reg=3.

Priorities

The India Semiconductor Mission (ISM) aims to build a sustainable, trusted, and globally competitive semiconductor and display ecosystem in India. Its broad focus is on strengthening manufacturing, design, supply-chain resilience, technology partnerships, and long-term strategic capability.

The major priorities under ISM are as follows:

ISM 1.0 priorities: [142]

- Create the foundational ecosystem for semiconductors in India.
- Attract investment in semiconductor fabs and display fabs.
- Support compound semiconductors and ATMP / OSAT facilities.
- Promote chip design and related ecosystem capability.
- Provide fiscal support to firms investing in these segments.

ISM 2.0 priorities: [143]

- To develop a roadmap towards advanced technology nodes, including 3 nm and 2 nm.
- Move beyond foundational capacity and deepen India's role in the semiconductor value chain.
- Support domestic production of semiconductor equipment and materials.
- Develop full-stack Indian semiconductor design IP.
- Strengthen domestic and global supply chains.
- Support R&D and training centres to build long-term sectoral capabilities.

[142] Press Information Bureau, "India Semiconductor Mission." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1885367&reg=3&lang=2. [Accessed: Mar. 16, 2026].

[143] Press Information Bureau (PIB), "India Semiconductor Mission 2.0: A Major Push in Budget 2026 towards Semiconductor Self-Reliance," pib.gov.in, Feb. 7, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2224839&reg=3&lang=1.

Implementation and Functional Architecture

The mission is implemented through a four-part scheme architecture under Semicon India. It is supported by ecosystem initiatives such as

a. Semiconductor Fabs

Contact info
Semiconductor fab, ISM, ism-dic@gov.in

This component is meant to support the establishment of silicon semiconductor wafer fabrication facilities in India.

The scheme provides fiscal support for up to 50% of the project cost on a pari passu basis. It is intended to attract large investments into advanced fabrication capacity and is linked with the creation of high-tech clusters with land, semiconductor-grade water, power, logistics, and research support [144]. Ongoing projects under this component:

Tata Electronics Fab, Dholera (Gujarat): India's major commercial silicon wafer fab, being set up in partnership with PSMC, Taiwan with an approved investment of ₹91,526 crore and a planned capacity of 50,000 wafer starts per month [145].

HCL–Foxconn Semiconductor Unit, Jewar (Uttar Pradesh): approved in May 2025 to manufacture display driver chips; the plant is designed for 20,000 wafers per month with a design output capacity of 36 million units per month [146]. The plant is anticipated to be fully functional in 2028.

b. Display Fabs

Contact info
Display Fab, ISM, ism-dic@gov.in.

This component supports the setting up of display fabrication facilities, including large, capital-intensive display manufacturing projects.

As with semiconductor fabs, the scheme provides up to 50% fiscal support on a pari passu basis for approved applicants. It is designed to expand India's role in the electronics manufacturing value chain beyond chips to include strategic display technologies[147].

[144] India Semiconductor Mission, "Semiconductor Fabs." [Online]. Available: https://ism.gov.in/semiconductor-fab. [Accessed: Mar. 16, 2026].
[145] Tata Electronics Private Limited, "Tata Electronics," Semiconductor Design, EMS, Fabrication, Assembly and Testing. [Online]. Available: https://www.tataelectronics.com/. [Accessed: Apr. 17, 2026].
[146] Press Information Bureau (PIB), "Cabinet approves semiconductor unit in Uttar Pradesh," pib.gov.in, May 14, 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2128604&reg=3&lang=2.
[147] India Semiconductor Mission, "Display Fabs." [Online]. Available: https://ism.gov.in/display-fab. [Accessed: Mar. 16, 2026].

c. Compound Semiconductor & ATMP

Contact info
Compound semiconductor & ATMP, ism-dic@gov.in.

This pillar supports the broader manufacturing ecosystem beyond silicon fabs, including compound semiconductors, silicon photonics, sensors, MEMS, discrete semiconductor fabs, and semiconductor assembly, testing, marking, packaging, and OSAT facilities.

Like other components, these facilities also receive 50% fiscal support on capital expenditure [148].

d. Design Linked Incentive Scheme

Contact info
DLI Scheme, ISM, support.chips-dli@cdac.in

This pillar supports semiconductor design for ICs, chipsets, SoCs, systems, IP cores, and semiconductor-linked designs through financial incentives and design infrastructure. The scheme is implemented by C-DAC, and the ChipIN/India Chip Centre serves as a one-stop design and fabrication support platform [149].

Semicon 2.0 Architecture

Semicon 2.0 extends the initial programme through a six-pillar architecture:

1. Design: Strengthening semiconductor design capabilities through the development of Indian intellectual property, chip designs, systems, and strategic and commercial semiconductor products.
2. Machines and Materials: Supporting companies involved in the R&D and manufacturing of semiconductor equipment, as well as materials, chemicals, and gases required for semiconductor production.
3. Setting up More Fabs: Expanding semiconductor manufacturing through additional silicon fabs, compound semiconductor fabs, discrete semiconductor fabs, display fabs, and related manufacturing facilities.
4. Advanced ATMP/OSAT: Strengthening semiconductor assembly, testing, marking, and packaging capabilities, with increasing emphasis on advanced packaging technologies.
5. Research and Development: Supporting the development of more advanced semiconductor technologies and nodes through partnerships with domestic and international research institutions.

[148] India Semiconductor Mission, "Compound Semiconductor & ATMP." [Online]. Available: https://ism.gov.in/compound-semiconductor. [Accessed: Mar. 16, 2026].
[149] India Semiconductor Mission, "Design Linked Incentive." [Online]. Available: https://ism.gov.in/design-linked-incentive. [Accessed: Mar. 16, 2026].

6. Talent Development: Expanding specialised training across chip design, fabrication, clean-room operations, semiconductor manufacturing, packaging, and related ecosystem requirements.

As per the Tracxn dataset, as of 18 May 2026, India had 816 semiconductor companies founded in the past 10 years (2017-26). This ecosystem is further supported by India's expanding chip-design capabilities, with government-backed design infrastructure support provided to 455 organisations, comprising 350 academic institutions and 105 startups [150].

Relevant Documents

Scheme for setting up semiconductor fabs in India: This document provides the policy framework for establishing silicon semiconductor wafer fabrication facilities in India. It offers fiscal support of up to 50% of the project cost to approved applicants and is intended to build domestic fabrication capacity as a core part of India's semiconductor ecosystem [151].

Scheme for setting up display fabs in India: This document talks about the scheme related to setting up display fabrication facilities in India. It also offers different fiscal support for project costs for approved applicants. It aims to strengthen India's role in display manufacturing as part of the wider electronics and semiconductor value chain.

Scheme for setting up compound semiconductor/silicon photonics/sensor fab and semiconductor (ATMP) / OSAT facilities in India: This document talks about a scheme that supports a wider range of semiconductor manufacturing activities beyond silicon fabs. It covers compound semiconductors, silicon photonics, sensors, MEMS, discrete semiconductors, and ATMP/OSAT facilities and mentions fiscal support for capital expenditures on approved units. The scheme is intended to strengthen specialised manufacturing and packaging capabilities across the Indian semiconductor ecosystem [152].

Modified Semicon India Program: This document provides an integrated overview of the modified Semicon India Program and presents India's value proposition to the global semiconductor ecosystem. It outlines a framework across fabrication, display manufacturing, compound semiconductors, packaging, and design and highlights India's policy intent to build a competitive, trusted, and investment-ready semiconductor ecosystem [153].

[150] Press Information Bureau, Government of India, "DLI Scheme-backed Chip Design Startup - Aheesa Digital Innovations Achieved First-Pass Silicon Success With 'VIHAAN', a Broadband Chip Built Using the Indigenous VEGA Microprocessor," Ministry of Electronics and Information Technology, Press Information Bureau, Aug. 15, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2299883&reg=48&lang=2.

[151] Ministry of Electronics and Information Technology, "Scheme for setting up of semiconductor fabs in India," Government of India, Notification No. G.S.R. 871(E), Dec. 21, 2021. [Online]. Available: https://ism.gov.in/.

[152] Ministry of Electronics and Information Technology, "Scheme for setting up of compound semiconductors / silicon photonics / sensors fab and semiconductor assembly, testing, marking and packaging (ATMP) / OSAT facilities in India," Government of India, Notification No. F. No. W-38/23/2021-IPHW, Dec. 21, 2021. [Online]. Available: https://d2p5j06zete1i7.cloudfront.net/Cms/admin/Download/1741754217.pdf.

[153] India Semiconductor Mission, "Modified Semicon India program: An opportunity for global semiconductor ecosystem," Ministry of Electronics & Information Technology, Government of India, Presentation, 2022. [Online]. Available: https://d2p5j06zete1i7.cloudfront.net/Cms/admin/Download/1738232194.pdf.

India Semiconductor Mission 2.0: This document presents the next phase of the India Semiconductor Mission, announced in February 2026. It notes the progress made under ISM 1.0 in fabrication, assembly, testing, and design, and states that ISM 2.0 will deepen the ecosystem by supporting equipment and materials, Indian semiconductor intellectual property, stronger domestic and global supply chains, and industry-led research and training centres [154].

For more details related to guidelines and schemes under the India Semiconductor Mission, kindly visit https://ism.gov.in/notifications/downloads

International Outlook

The India Semiconductor Mission is oriented towards deeper participation in the global value and supply chains in the semiconductor ecosystem. Its current priorities span fabrication, large-scale packaging, design, equipment, materials, research, and supply chain resilience.

The mission is positioned to work across a broad set of engagement areas, including fab manufacturing, advanced packaging, design and IP, materials, equipment, skills, and application-led semiconductor capability. ISM is collaborating with different countries such as the US, Japan, Malaysia, Singapore, the EU, and industry and research organisations such as Micron Technology, FOXCONN, IBM, and Purdue University to strengthen technology capability, research, talent standards, and resilient supply chains, and it remains open for further collaboration. Recently, Tata Electronics and ASML (Advanced Semiconductor Materials Lithography) signed an MoU to support India's semiconductor manufacturing ecosystem. The collaboration will focus on deploying ASML's advanced lithography tools and solutions for Tata Electronics' Dholera Fab. The collaboration will focus on deploying ASML's advanced lithography tools and solutions at Tata Electronics' Dholera Fab, which is central to India's first commercial semiconductor fabrication project[155].

India is also consciously taking efforts to join consortia, coalitions, and industry platforms that are shaping the semiconductor ecosystem. SEMICON India is an important platform in this process. It provides attractive incentives to companies engaged in the semiconductor ecosystem. Through ISM, India is positioning itself as a partner in global value and supply chains within the semiconductor ecosystem, while building capabilities across the full value chain.

[154] Press Information Bureau, "India Semiconductor Mission 2.0," Jul. 15, 2026. [Online]. Available: https://d2p5j06zete1i7.cloudfront.net/Cms/admin/PressRelease/1784110792.pdf.

[155] Tata Electronics, "Tata Electronics and ASML Announce Strategic Partnership to Advance the Semiconductor Manufacturing Ecosystem in India," Tata Sons Pvt. Ltd., Mumbai, India, Press Release, May 17, 2026. [Online]. Available: https://www.tata.com/newsroom/business/tata-electronics-asml-semiconductor-ecosystem.

V. Biopharma SHAKTI

Point of Contact
Secretary, Department of Pharmaceuticals, secretary@pharma-dept.gov.in.

The Biopharma Strategy for Healthcare Advancement through Knowledge, Technology & Innovation (SHAKTI) scheme aims to strengthen India's standing in the global biopharmaceutical ecosystem. The initiative aims to scale up India's domestic manufacturing of high-value biologics and biosimilars and reduce import dependence. The Department of Pharmaceuticals, under the Ministry of Chemicals and Fertilisers, is the nodal agency responsible for the scheme[156].

Budget

The scheme was announced in February 2026 as a part of the Union Budget FY 2026-2027, with a financial outlay of ₹ 10,000 crore (~US$ 1.064B) for the period of five years (2026-31) [157].

Priorities

The scheme focuses on expanding the network of skilled human resources in biopharma by creating three new National Institutes of Pharmaceutical Education and Research (NIPERs) and upgrading the seven existing ones. It also proposes enhancing innovation by developing 1,000 accredited clinical trial sites nationwide. Additionally, it aims to improve the regulatory framework by enhancing the capacity of the Central Drugs Standard Control Organisation (CDSCO) [158].

[156] Press Information Bureau, "Transforming India into a Global Biopharma Hub." [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=157147&ModuleId=3&reg=3&lang=1&. [Accessed: Mar. 12, 2026].

[157] Press Information Bureau, "Transforming India into a Global Biopharma Hub." [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=157147&ModuleId=3&reg=3&lang=1&. [Accessed: Mar. 12, 2026].

[158] Press Information Bureau, "Bio Pharma SHAKTI scheme." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2237416&reg=3&lang=1&. [Accessed: Mar. 12, 2026].

VI. Deep Ocean Mission

Point of Contact
Secretary, Ministry of Earth Sciences (MoES),
secretary@moes.gov.in

URL
https://incois.gov.in/site/deep-ocean.jsp

The Deep Ocean Mission is a national mission anchored by the Ministry of Earth Sciences (MoES). It was approved in June 2021 as a mission-mode,multi-institutional programme to explore the deep ocean for resources, develop deep-sea technologies, expand scientific understanding of the oceans, and support the sustainable use of ocean resources in line with India's Blue Economy vision [159]. The mission has also been identified as one of the nine national missions under PM-STIAC and is being implemented in coordination with central ministries, national institutions, universities, and industry [160].

Budget

The mission has an outlay of ₹ 4077.0 crores (~US$ 443.20M[161]) and is being implemented in a phase-wise manner over a period of five years (2021-26). The period of the mission is until 2028.

Priorities

The Deep Ocean Mission aims to explore and sustainably harness deep-ocean living and non-living resources while building indigenous technologies and scientific capabilities for deep-sea exploration. Its priorities include:

- Develop deep-sea mining technologies.
- Build capability in human submersibles and underwater robotics.
- Strengthen ocean climate advisory services.
- Support deep-sea biodiversity exploration and conservation.
- Undertake surveys of hydrothermal mineral resources.
- Promote ocean-based energy and desalination technologies.
- Support marine biology translation and incubation.

[159] Economic Advisory Council to the Prime Minister (EAC-PM), "India's Blue Economy: A Draft Policy Framework," incois.gov.in, Sep. 2020. [Online]. Available: https://incois.gov.in/documents/Reports/Others/Report_2020_20251023100635.pdf.
[160] Press Information Bureau, "Cabinet approves Deep Ocean Mission." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1727525&reg=3&lang=2&. [Accessed: Mar. 12, 2026].
[161] The exchange rate on 11th March 2026 was 91.9 for $1.

- Strengthen India's Blue Economy.
- Improve coastal resilience.
- Advance indigenous technology development across the ocean sector.

Implementation and Functional Architecture

The Deep Ocean Mission is implemented through a six-vertical architecture. This structure integrates deep-sea technology development, scientific research, climate services, biodiversity, mineral exploration, and ocean-based innovation into a single coordinated mission framework. The mission involves many different organisations:

S. No	Name of the organisation	Area of focus (for Deep Ocean Mission)	Point of Contact Details
1	National Institute of Ocean Technology (NIOT)	deep-sea mining systems, human submersibles, underwater robotics, ocean energy and desalination	Director (NIOT) - director.niot@gov.in
2	The Indian National Centre for Ocean Information Services (INCOIS)	deep-ocean observations, climate services, coastal and ocean advisories	Director (INCOIS) - director@incois.gov.in
3	The Centre for Marine Living Resources and Ecology (CMLRE)	biodiversity exploration, conservation, and marine bio-prospecting	Head, CMLRE- mahesh..gov.in
4.	The National Centre for Polar and Ocean Research (NCPOR)	survey and exploration of hydrothermal mineral resources and vents	Director (NCPOR) - director@ncpor.res.in

Table 8: Different Organisations under Deep Ocean Mission

As of February 2026, the mission had sanctioned 141 collaborative research projects with around 69 national government and private institutions to complement the core activities[162]. The six verticals of the Deep Ocean mission are as follows:

1. Design and development of technologies for deep-sea mining, human submersibles, and underwater robotics capability

Contact info
Group Head, Deep Sea Technology, NIOT, sramesh.niot@gov.in

This vertical focuses on building India's capability in deep-sea mining systems, human-occupied submersibles, and underwater robotics. Its flagship element is MATSYA 6000, a manned submersible designed to carry three people to a depth of 6,000 metres, with an integrated mining system for polymetallic nodules in the Central Indian Ocean [163].

[162] Indian National Centre for Ocean Information Services, "Deep Ocean Mission." [Online]. Available: https://incois.gov.in/site/deep-ocean.jsp?. [Accessed: Mar. 12, 2026].

[163] Ministry of Earth Sciences, "Matsya-6000: India's Fourth-Generation Deep-Ocean Submersible successfully Completes Wet Testing," Feb. 17, 2025. [Online]. Available: https://www.moes.gov.in/static/uploads/2025/06/f8016c8917d4bc01e9204201da530aff.pdf?.

2. Ocean Climate Change Advisory Services (OCCAS)

Contact info
Director (INCOIS),
director@incois.gov.in

The focus of this vertical is to develop observations, models, and climate advisory tools specifically for the deep ocean and India's coasts. It covers future projections of sea-level rise, cyclones, storm surges, waves, coastal erosion, and related climate risks. This vertical is implemented by INCOIS in Hyderabad and includes the development of a deep-ocean observing system using gliders, Argo floats, wave drifters, and cabled observatories.

3. Strengthen technological innovations for exploration and conservation of deep-sea biodiversity

Contact info
Head, CMLRE,
mahesh..gov.in

This vertical focuses on bioprospecting deep-sea flora, fauna, and microbes, along with research on their sustainable use. It is intended to improve understanding of deep-sea ecosystems while supporting future applications in marine biotechnology and resource use.

4. Deep Ocean Survey and Exploration of Minerals from Hydrothermal Vents

Contact info
Director (NCPOR),
director@ncpor.res.in

The goal of this vertical is to identify and characterise multi-metal hydrothermal sulphide deposits along the mid-ocean ridges of the Indian Ocean. It is a resource-exploration component, and NCPOR is the nodal agency for the hydrothermal studies programme.

5. Advance Ocean-Based Energy and Freshwater Systems

Contact info
Director (NIOT),
director.niot@gov.in

This vertical focuses on developing engineering capability for Ocean Thermal Energy Conversion (OTEC) and desalination. The objective is to move toward offshore systems that can support clean energy generation and freshwater production, particularly for coastal and island areas.

6. Advanced Marine Station for Ocean Biology

Contact info
Project Director, NIOT,
vinithkumar.niot.gov.in

This vertical is intended to translate ocean biology research into industrial applications, product development, and incubation support. It is designed to strengthen marine biological research, applied innovation, and site-based enterprise development through advanced marine stations and associated facilities. This vertical links basic marine science to downstream innovation and blue-economy applications [164].

[164] Press Information Bureau, "DEEP OCEAN MISSION: India's Gateway to the Ocean Floor." [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/aug/doc2025817614501.pdf?. [Accessed: Mar. 12, 2026].

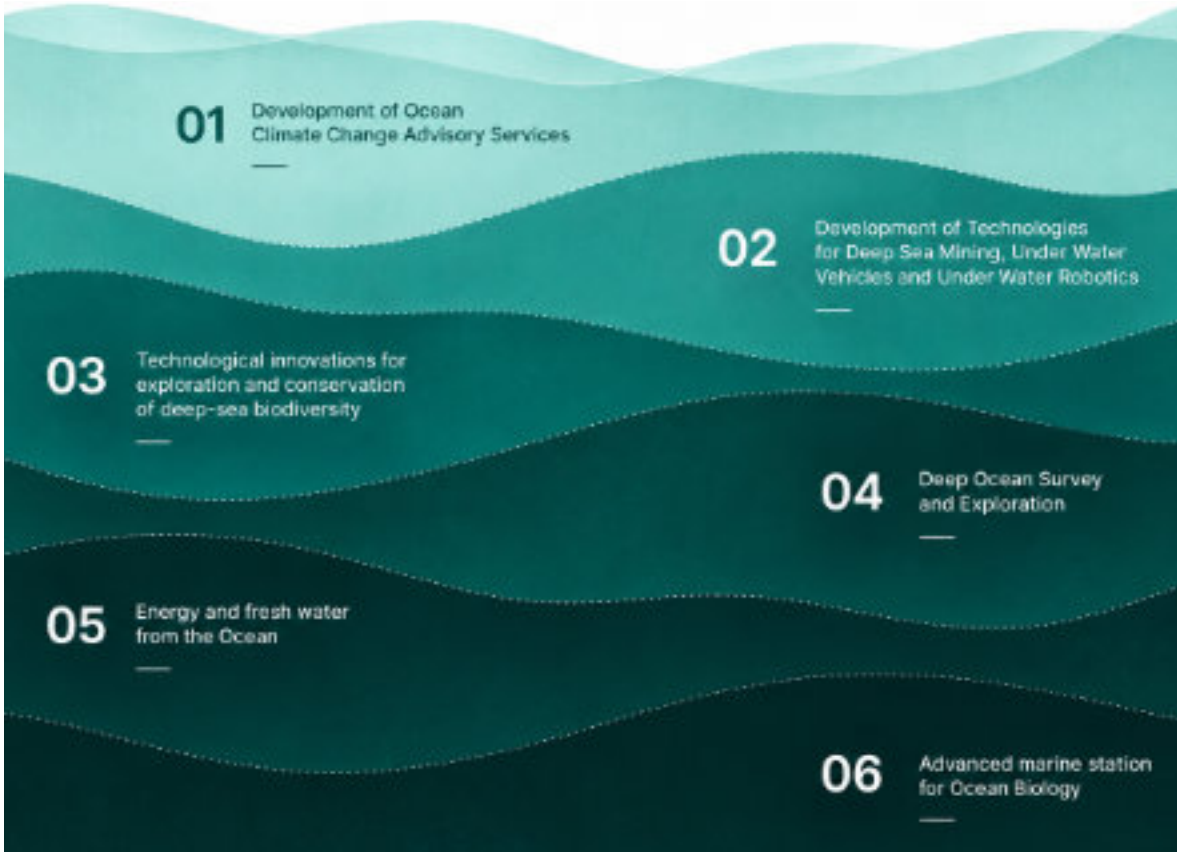


Fig 2: Objectives of Deep Ocean Mission
Source: https://www.amsob.in/NIOT/Deep-Ocean-Mission

Relevant Documents

Cabinet approval note of Deep Ocean Mission: This is the primary document for the mission. It records the Cabinet Committee on Economic Affairs' (CCEA) approval for the mission, the phase-wise structure, and the mission's six major components/verticals [165].

Deep Ocean Mission/India's gateway to the ocean floor: This is a recent explainer document. It presents the mission's strategic rationale, major milestones, and recent progress [166].

Parliament Update – Deep Ocean Mission: This document provides updated information on the six verticals, MATSYA 6000 / Samudrayaan progress, deep-sea biodiversity work, hydrothermal vent identification, and other implementation milestones [167].

[165] Press Information Bureau (PIB) Research Unit, "Deep Ocean Mission: Harnessing Blue Economy for New India," Apr. 26, 2022. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/apr/doc202242649701.pdf.

[166] Press Information Bureau (PIB), "DEEP OCEAN MISSION: India's Gateway to the Ocean Floor," Aug. 17, 2025. [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?ModuleId=3&NoteId=155043&reg=3&lang=2.

[167] Press Information Bureau (PIB), "PARLIAMENT QUESTION: DEEP OCEAN MISSION - Major milestones achieved under the Deep Ocean Mission," Feb. 4, 2026. [Online]. Available: https://www.pib.gov.in/PressReleaseDetail.aspx?PRID=2223079&lang=1&reg=3.

International Outlook

The Deep Ocean Mission is a catalytic platform for engagement in marine science, seabed governance, deep-sea technology, ocean observation, and polar research.

India already has a credible institutional base in these areas through its work under the International Seabed Authority, its ocean information and warning systems, and its established scientific infrastructure under the Ministry of Earth Sciences.

This creates a strong basis for taking forward cooperation in

1. deep-sea mineral exploration,
2. environmental studies,
3. underwater systems,
4. marine biodiversity, and
5. science-based governance of ocean resources.

The mission provides a framework for advancing joint research, technology development, scientific mobility, training, data-sharing, and expedition-led collaboration.

Priority areas for the next phase may include:

- Deep-sea mining systems,
- Human submersibles,
- Underwater robotics,
- Ocean climate services,
- Marine bio-resources,
- Desalination and deep-ocean observations.

There is also scope to connect the mission more closely with work in the Indian Ocean, Arctic, Antarctic, and polar domains, particularly where ocean science, resource assessment, and technology development intersect.

Deep Ocean Mission is an enabling instrument for broader cooperation in the ocean sector. India is open to deepening engagement with partner countries, research institutions, and multilateral bodies in ways that support scientific capability, resilient ocean governance, and long-term blue economy priorities.

VII. Drone Shakti Mission

The Drone Shakti Mission is the flagship initiative for drone manufacturing and innovation, aimed at creating an indigenous drone ecosystem. The mission has a five-year implementation timeline (2026-27 to 2030-31). The Ministry of Civil Aviation is the anchoring agency for the mission.

Budget

The Mission has a financial outlay of ₹ 1,550 crore (~US$ 164.76M), of which ₹ 500 crore (~US$ 53.15M) is allocated for research and development and ₹ 1,050 crore (~US$ 111.61M) for boosting component manufacturing.

Priorities

The mission primarily focuses on enhancing competitiveness, accelerating indigenisation, enabling investments for capacity, and funding research and development in the drone and related components sector.

Implementation and Functional Architecture

The implementation architecture of the mission has two components:

PART A: Research and Development Funding: The mission will have dedicated funding for R&D in drones, components, and emerging technologies. The funding will be channelled through Anusandhan National Research Foundation, with the Office of PSA acting as the executive chair. The funding limit is ₹ 5 crore for now and can be extended to ₹ 10 crore for select cases. A technical committee will also be constituted for this component to evaluate proposals and identify key funding problem areas.

PART B: Incentives for Boosting Component Manufacturing: This component has two types of incentives: capital incentives and component manufacturing incentives. Both MSME and non-MSME manufacturers are eligible for incentives under the scheme, provided their investments in plant and machinery are specifically in drone technologies.

VIII. National Green Hydrogen Mission

Point of Contact
Secretary, Ministry of New and Renewable Energy,
secy-mnre@nic.in

URL
https://nghm.mnre.gov.in/

The National Green Hydrogen Mission was launched in 2023 to establish a green hydrogen ecosystem in India by increasing the production, use, and export of green hydrogen and its derivatives[168]. The Ministry of New and Renewable Energy (MNRE) is the ministry responsible for the overall coordination and implementation of the mission. To formulate schemes and programmes related to the mission, a separate secretariat (the National Green Hydrogen Mission Secretariat) has been established under MNRE.

Budget

The mission was launched in 2023 with an initial outlay of ₹19,744 crore (~US$ 2.5B) for the period of over six years (2023–29) .

Additionally, state-level implementation is becoming a major source of investment under NGHM, with Uttar Pradesh, Punjab, Odisha, Gujarat and Rajasthan all devising specific state policies for the production and utilisation of green hydrogen. For example, Uttar Pradesh's Green Hydrogen Policy 2024 targets 1 million metric tonnes of clean hydrogen per year by 2028, offering a capital subsidy of up to 30% and providing the first five projects with a subsidy of up to 40%, capped at ₹ 225 crore. The investments now link not only to national SIGHT incentives but also to state-level subsidy policies [169].

Private investments under the mission are primarily made through the tendering process, which is for equipment manufacturing. For example, electrolyser manufacturing-approved projects are under entities such as Reliance Electrolyser Manufacturing, L&T Electrolysers, John Cockerill Greenko, Ohmium, and Matrix Gensol.

[168] Ministry of New and Renewable Energy, "National Green Hydrogen Mission," Jan. 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/01/2023012338.pdf?utm.

[169] Ministry of New and Renewable Energy, "National Green Hydrogen Mission Portal of India." [Online]. Available: https://nghm.mnre.gov.in/. [Accessed: May 25, 2026]. Invest UP, Government of Uttar Pradesh, "Uttar Pradesh Green Hydrogen Policy 2024," Jun. 2024. [Online]. Available: https://invest.up.gov.in/green-hydrogen-policy/.

Priorities

The mission has specified targets such as building capabilities to produce at least 5 MMT of green hydrogen per annum by 2030, replacing fossil fuels with renewable fuels and feedstocks based on green hydrogen, and establishing indigenous manufacturing of electrolysers and other enabling technologies of green hydrogen [170].

Implementation and Functional Architecture

The functional architecture of the mission focuses on three aspects: (i) demand creation, (ii) incentivising supply, and (iii) building an enabling ecosystem. For each of these aspects, the mission has devised critical components and schemes that are explained below.

a. Manufacturing Fertilisers Using Green Ammonia and Usage of Green Steel

Contact info
corporate@seci.co.in

The mission framework proposes using green ammonia to manufacture fertilisers and green steel to create demand for green hydrogen as a cleaner alternative to fossil fuels in these industries. By 2034-35, the mission envisions substituting all ammonia-based fertiliser imports with domestic green ammonia[171]. The Solar Energy Corporation of India (SECI) is charged with the bidding process for green ammonia.

The recent competitive bidding conducted by SECI reported a price range of 49.75 – 64.74 per kg for green ammonia, which is competitive compared to global benchmarks, which stood at 110 per kg [172].

Green ammonia and green methanol pilot projects for refuelling and bunkering in the maritime sector have also been initiated in collaboration with the Ministry of Ports, Shipping and Waterways and the Shipping Corporation of India.

b. Strategic Interventions for Green Hydrogen Transition (SIGHT)

Contact info
Secretary, DPIIT,
secy-ipp@nic.in

The SIGHT programme is an incentivisation mechanism that provides financial incentives to green hydrogen producers (companies/entities that set up production facilities).

[170] Ministry of New and Renewable Energy, "National Green Hydrogen Mission," Jan. 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/01/2023012338.pdf?utm.

[171] Ministry of New and Renewable Energy, "National Green Hydrogen Mission," Jan. 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/01/2023012338.pdf?utm.

[172] Press Information Bureau, "SECI conducts first-ever auction for procurement of Green Ammonia under National Green Hydrogen Mission." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2153006. [Accessed: Mar. 16, 2026].

The programme has two components:

Component I: Support for domestic manufacturing of electrolysers.

Component II: Green Hydrogen Production.

The programme has been allocated ₹ 17,490 crore till FY 2029-30 to increase the supply of green hydrogen and its derivatives [173].

The Solar Energy Corporation of India is the implementing agency of the programme.

As of February 2026, 15 companies had been incentivised to produce 3,000 MW per year of electrolyser manufacturing capacity, 18 companies had been incentivised to produce 8,62,000 tonnes per year of green hydrogen, and 2 companies had been awarded 20,000 tonnes per year of green hydrogen supply capacity for refineries.

c. Green Hydrogen Hubs

Contact info
Secretary, DST,
dstsec@nic.in

To support large-scale production and to reduce the technical and logistical challenges involved in transporting green hydrogen, green hydrogen hubs have been established.

In 2025, the Ministry of New and Renewable Energy announced three major ports as green hydrogen hubs: Deendayal Port Authority in Gujarat, Paradip Port Authority in Odisha, and V.O. Chidambaram Port Authority in Tamil Nadu [174].

The PM Gati Shakti Portal will be used for infrastructural and resource mapping of the hubs to ensure seamless coordination with other national-level infrastructural projects.

In 2025, Hydrogen Valley Innovation Clusters (HVICs) were added as a component, alongside green hydrogen hubs, to initiate innovation in the creation of large-scale hubs. Recently, Kerala, Jodhpur, Odisha, and Pune were also recognised as hydrogen valleys. The valleys are being developed with a total investment of ₹ 485 crore, of which ₹ 169.89 crore comes from NGHM and

[173] MINISTRY OF NEW AND RENEWABLE ENERGY, "National Green Hydrogen Mission." [Online]. Available: https://mnre.gov.in/en/national-green-hydrogen-mission. [Accessed: Mar. 9, 2026].

[174] Press Information Bureau, "Three Major Ports Recognised as Green Hydrogen Hubs under National Green Hydrogen Mission." [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2177591. [Accessed: Mar. 16, 2026].

₹ 315.43 crore from industry and consortium partners [175]. These HVICs will be monitored by the Department of Science and Technology (DST).

d. Strategic Hydrogen Innovation Partnership (SHIP)

Contact info
Director General, BEE,
dg-bee@nic.in

The SHIP initiative under the mission focuses on the R&D component through public and private partnerships. It supports the development of internationally competitive hydrogen technologies through collaborative research. The NGHM has a dedicated ₹ 400 crore R&D component for this purpose [176].

MNRE is the nodal agency responsible for implementing the initiative, but the Department of Science and Technology and other scientific institutions, such as IISc, IITs, IISERs, and CSIR labs, have played a significant role in expanding its scope.

Standards, Certification, and Safety

For standardisation and certification purposes, the Green Hydrogen Certification Scheme of India (GHCI) was initiated in 2025.

With the Bureau of Energy Efficiency (BEE) as its nodal agency, the framework certifies hydrogen as "green" based on an assessment of greenhouse gas emissions across the entire production cycle [177].

Any green hydrogen-producing facility in the country requires a 'Final Certificate' under GHCI to receive subsidies or to sell and use green hydrogen domestically.

Relevant Documents

National Green Hydrogen Mission Framework: The NGHM framework acts as a roadmap of the mission. It enlists all the objectives, targets, and vision of the mission. The framework also lays out the implementation roadmap for the mission, with defined targets for each phase and year [178].

[175] Press Information Bureau, "India is a Key Part of the Global Transition to Self-Reliant Hydrogen Economy, Says Dr. Jitendra Singh at ICGH 2025," Nov. 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2189242&utm&reg=3&lang=2.

[176] Ministry of New and Renewable Energy, "National Green Hydrogen Mission," Jan. 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/01/2023012338.pdf?utm.

[177] Press Information Bureau, "Green Hydrogen Standard for India," Aug. 18, 2023. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2023/aug/doc2023819241201.pdf?.

[178] Ministry of New and Renewable Energy, "National Green Hydrogen Mission," Jan. 2026. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/01/2023012338.pdf?utm.

Green Hydrogen Standard for India: The mission-related document was released by MNRE in 2023. The notification provides the basic definition of what qualifies as "green hydrogen" in India. The notification also declares BEE as the nodal agency for certification and verification. Additionally, it states that MNRE will prepare a scientific methodology for measurement, reporting, and monitoring [179].

SIGHT Scheme Modules and Guidelines: The guidelines for the SIGHT programme are released on a component basis, covering every aspect of the scheme. For each component, including manufacturing of electrolysers, procurement of green ammonia, production of green hydrogen, and procurement of green hydrogen for refineries, there are separate sets of guidelines for reference [180].

Hydrogen Hub Guidelines: The Hydrogen Hub mission's guidelines address its infrastructural dimension. It argues for common area facilities to create commercially viable hydrogen ecosystems. The guidelines highlight the implementation methodology, rationale, and financial disbursement procedures [181].

International Outlook

The international cooperation component of the National Green Hydrogen Mission focuses on strategic partnerships and engagements to increase domestic production, build standardised regulations, and develop relevant technologies to support the expansion of green hydrogen.

- India has already started producing green hydrogen, with 19 domestic firms having a production capacity of nearly 8,62,000 tonnes per year,[182] and has further established dedicated green hydrogen hubs in Odisha, Tamil Nadu, and Gujarat.

Long-term trade agreements with international partners would facilitate exports of the capacity produced by these mechanisms.

- Existing bilateral engagements with nations such as Australia and Germany focus on developing technologies such as electrolysers and fuel cells, which are essential for producing green hydrogen [183].

[179] Press Information Bureau, "Green Hydrogen Standard for India," Aug. 18, 2023. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2023/aug/doc2023819241201.pdf?.

[180] Ministry of New and Renewable Energy, "Hydrogen Schemes & Guidelines." [Online]. Available: https://mnre.gov.in/en/hydrogen-schemes-guidelines/. [Accessed: Mar. 10, 2026].

[181] Ministry of New and Renewable Energy, "Scheme Guidelines for setting up Hydrogen Hubs in India under the National Green Hydrogen Mission (NGHM)," Mar. 15, 2024. [Online]. Available: https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2024/03/20240316695795641.pdf?.

[182] Press Information Bureau, "Unlocking India's Green Hydrogen Production Potential." [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=152130&ModuleId=3&reg=3&lang=1. [Accessed: Mar. 9, 2026].

[183] Ministry of New and Renewable Energy, "India-Australia Green Hydrogen Taskforce – Recommendation Report." [Online]. Available: https://mnre.gov.in/en/document/india-australia-green-hydrogen-taskforce-recommendation-report/?. [Accessed: Mar. 9, 2026]. Press Information Bureau, "Joint declaration of Intent on Indo–German Green Hydrogen Task Force signed." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1822146&. [Accessed: Mar. 9, 2026].

Additionally, these existing engagements explore private investment from these countries to scale R&D in the sector, signalling opportunities for financial investments within the domain.

For knowledge creation, international academic collaborations are an important factor. India has actively focused on such collaborations; for example, DST recently initiated an India-Netherlands fellowship to strengthen India's readiness for hydrogen technologies through exposure to the advanced hydrogen ecosystem in the Netherlands [184].

India has remained active in multilateral engagements, participating in and hosting summits and forums that discuss the future scope of green hydrogen. In 2024 and 2025, India hosted the International Conference on Green Hydrogen, inviting stakeholders from across industries and the globe.

[184] Department of Science & Technology, "DST Strengthens India-Netherlands Cooperation in Green Hydrogen Research and Capacity Building." [Online]. Available: https://dst.gov.in/dst-strengthens-india-netherlands-cooperation-green-hydrogen-research-and-capacity-building?. [Accessed: Mar. 9, 2026].

IX. National One Health Mission

Point of Contact
Director-in-charge, ICMR-National Institute of One Health, Nagpur,
yadav.pragya@gov.in

URL
https://www.psa.gov.in/oneHealthMission

https://www.icmr.gov.in/national-one-health-mission

The National One Health Mission is a cross-sectoral national mission, approved in 2022, to build an integrated system for disease control and pandemic preparedness by bringing together the human, animal, and environmental health sectors.

It was recommended by the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) and conceptualised by the Office of the Principal Scientific Adviser to the GOI [185].

It is coordinated by the Department of Health Research (DHR), Ministry of Health and Family Welfare, with ICMR as the lead implementation platform. The mission's anchor institution is the National Institute of One Health (NIOH), Nagpur [186].

Budget

A budget outlay of ₹386.86 crore (~US$ 41.93M) has been approved for 2027–28 for interface and coordination activities to strengthen R&D for One Health under the Prime Minister's Ayushman Bharat Health Infrastructure Mission (PM-ABHIM).

Priorities

The objective of the mission is to build an integrated disease control and pandemic preparedness system in India to achieve better health outcomes, improve productivity, and conserve biodiversity. It is intended to institutionalise the One Health approach and strengthen surveillance, outbreak response, research, diagnostics, medical countermeasures, data integration, and capacity building across sectors [187].

Implementation and Functional Architecture

The mission is being implemented through a two-tier governance framework. At the apex is the executive steering committee, chaired by the union health minister, which provides policy direction and inter-ministerial oversight. It is supported by the Scientific Steering Committee, chaired by the Principal Scientific Adviser to the GOI,

[185] Office of the Principal Scientific Adviser (PSA), "National One Health Mission." [Online]. Available: https://www.psa.gov.in/oneHealthMission. [Accessed: Mar. 10, 2026].

[186] Ministry of Health & Family Welfare, "Initiatives & Achievements-2024." [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2024/dec/doc20241228477601.pdf. [Accessed: Mar. 10, 2026].

[187] Indian Council of Medical Research, "National One Health Mission." [Online]. Available: https://www.icmr.gov.in/national-one-health-mission?. [Accessed: Mar. 10, 2026].

which provides scientific guidance and enables coordination across departments. The mission is guided by an integrated framework developed collaboratively by over 18 ministries and departments.

The mission has six major components:

1. capacity building, collaboration, communication, & storage of potential high-risk pathogens;
2. creation of a national network of existing and upcoming BSL-3/BSL-4 laboratories;
3. development of AI tools, next-generation sequencing, diagnostic algorithms, and metagenomic pipelines for emerging pathogens;
4. protocols, tools, and frameworks for integrated disease surveillance at the animal-human-environment interface;
5. development of plug-and-play vaccine platforms, diagnostics, therapeutic monoclonals;
6. analytic capability to derive better insights from data across human, livestock, and wildlife sectors.

Infectious Disease Research and Diagnostic Laboratories (IRDLs)

Contact info
Secretary to GOI, Department of Health Research & Director General, ICMR, secy-dg@icmr.ac.in.

Head, Communicable Diseases Division, ICMR, guptanivedita.hq.icmr.gov.in.

As part of this, ICMR is establishing IRDLs in selected state and central government institutes and medical colleges that already have functioning Virus Research and Diagnostic Laboratories (VRDLs). These IRDLs are intended to strengthen advanced diagnostics in bacteriology, mycology, and parasitology and to serve as regional referral laboratories for infectious disease diagnosis and research.

List of proposed IRDLs can be found here: https://www.icmr.gov.in/icmrobject/uploads/Gallery/1726566669_irdl_website.pdf

National Centre for Disease Control (NCDC)

Contact info
Director NCDC & Programme Director, IDSP, dirnicd@nic.in

Head of Department, IDSP, himanshu.chauhan.nic.in

The Integrated Disease Surveillance Program (IDSP) under the NCDC provides an important surveillance platform for the NOHM. It supports integrated monitoring, early warning, and coordinated outbreak response by enabling the use of shared surveillance systems across sectors. IDSP helps strengthen the mission's objectives on integrated disease surveillance, laboratory linkage, pathogen detection, and preparedness at the human-animal-environment interface.

Dashboard for National One Health Mission

Scan QR to visit One Health Mission Dashboard

The National One Health Mission Dashboard is hosted by the Office of the Principal Scientific Adviser to the GOI. It serves as a one-stop repository of state, central, and multilateral One Health initiatives. It is intended to improve visibility, coordination, monitoring, and gap identification across sectors and to support a more integrated view of mission activities.

Fig 3: Inter-ministerial Stakeholders of National One Health Mission

Relevant Documents

Ministry of Health & Family Welfare, Initiatives & Achievements-2025: This document serves as a recent progress note on major health initiatives. In the section on PM-ABHIM, it refers to support for the One Health approach through integrated surveillance, infectious disease research, and stronger preparedness systems for future outbreaks and pandemics.[188]

[188] Ministry of Health & Family Welfare (MoHFW), "Initiatives & Achievements-2025," Jan. 2026. [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/jan/doc202611749801.pdf.

One Health Governance Model Framework for States and Union Territories (December 2025): This document, which was released by the Office of PSA, explains the mission's two-tier governance model, including the roles of the Executive Steering Committee and the Scientific Steering Committee. It is an important reference for implementation and state-level institutionalisation.[189]

International Outlook

Under India's G20 presidency, One Health emerged as an important area of discussion, with emphasis on the interdependence of human, animal, and environmental health. As an outcome of the G20 Chief Science Advisers' Roundtable (CSAR), a virtual network of One Health Institutes was initiated to support global collaboration, capacity development, and knowledge-sharing in priority One Health areas.[190] The initiative provides a useful basis for taking forward cooperation in research, technologies, surveillance, and preparedness under the National One Health Mission.

The mission also aligned with the One Health Quadripartite of the World Health Organisation (WHO), Food and Agriculture Organisation of the United Nations (FAO), United Nations Environment Programme (UNEP), and the World Organisation for Animal Health (WOAH), including the One Health Joint Plan of Action developed to support countries in operationalising the one health approach[191].

India is actively doing further engagement through mission-linked convening with multilateral agencies, development partners, and national institutions. The next phase may be pursued through structures for joint research, common protocols and standards, laboratory and surveillance networks, training, data-sharing, and coordinated outbreak response, with the National One Health Mission serving as a practical platform for sustained engagement in One Health. This can also support related priority areas within the wider One Health landscape, including antimicrobial resistance, pathogen discovery, diagnostics, and stronger preparedness systems across human, animal, and environmental health. In this context, the National One Health Mission intends to serve as a platform for sustained institutional engagement and coordinated action.

[189] Office of the Principal Scientific Adviser to the Government of India, "OH Model Governance Framework," Dec. 17, 2025. [Online]. Available: https://psa.gov.in/CMS/web/sites/default/files/publication/OH%20Model%20Governance%20Framework_17Dec2025.pdf.

[190] G20 Chief Science Advisers' Roundtable, "G20-Chief Science Advisers' Roundtable (G20-CSAR) Outcome Document and Chair's Summary," Aug. 28, 2023. [Online]. Available: https://www.g20.in/content/dam/gtwenty/gtwenty_new/document/G20_CSAR_Outcome_Document_and_Chair_Summary_28Aug.pdf.

[191] Ministry of External Affairs, "G20 New Delhi Leaders' Declaration," mea.gov.in, Sep. 10, 2023. [Online]. Available: https://www.mea.gov.in/Images/CPV/G20-New-Delhi-Leaders-Declaration.pdf.

X. Carbon Capture, Utilisation, and Storage (CCUS)

Point of Contact
Joint Secretary (Thermal), Ministry of Power, jsthermal-mop@gov.in

Dr. Anita Gupta, Head & Adviser, Technology Mission Division, Department of Science and Technology, anigupta@nic.in

URL
https://dst.gov.in/carbon-capture-utilisation-and-storage-ccus

CCUS is a decarbonisation method that focuses on capturing, storing, or productively using CO_2 emitted from industrial or power-generation sources so that it does not enter the atmosphere. The Ministry of Power has been allocated ₹ 500 crore for CCUS expansion in the FY 2026-27 budget estimates.[192] Apart from this, the Department of Science and Technology is already working on the research and innovation component of CCUS technology development. The recent steps taken towards CCUS further the enabling environment created by the Carbon Credit Trading Scheme, 2023, a focused policy tool to build a structured, regulated carbon pricing ecosystem [193].

Budget

In the 2026-27 Union Budget, a financial outlay of ₹ 20,000 crore (~US$ 2.13B [194]) over five years (till FY 2031) has been provided to scale up CCUS technologies in India [195].

Priorities

In India, CCUS is seen as a decarbonisation pathway for hard-to-abate sectors such as steel, cement, and chemicals, wherein absolute substitution of fossil fuels is difficult in the short term. The R&D roadmap to enable India's Net Zero Targets through CCUS", launched in 2025 by DST, acts as a guide for coordinated action for the development and deployment of CCUS technologies [196].

[192] Ministry of Finance, "Expenditure Budget 2026-2027 [Incorporating Notes on Demands for Grants]," Feb. 2026. [Online]. Available: https://www.indiabudget.gov.in/doc/eb/allsbe.pdf?.

[193] Press Information Bureau, "Carbon Pricing in India: Market Mechanisms for Climate Leadership." [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154721&ModuleId=3&reg=3&lang=2&. [Accessed: Mar. 10, 2026].

[194] At exchange rate of US$ 1 = ₹94.01 (March 25, 2026)

[195] Press Information Bureau, "Union Budget FY 2026-2027: Chemical Parks." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2222931&reg=3&lang=1&:text=emissions-intensive%20sectors.-,An%20allocation%20of%20Rs%2020%2C000%20crore%20has%20been%20announced%20to,over%20the%20next%20five%20years. [Accessed: Mar. 10, 2026].

[196] Department of Science & Technology, "R&D Roadmap to Enable India's Net-Zero Targets through Carbon Capture, Utilization and Storage (CCUS) Launched." [Online]. Available: https://dst.gov.in/R%26D-Roadmap-to-enable-India%27s-Net-Zero-Targets-through-Carbon-Capture-Utilization-and-Storage-%28CCUS%29-launched. [Accessed: Mar. 10, 2026].

XI. Electric Vehicle Missions

Point of Contact
For PM E-DRIVE Scheme and PLI Scheme for ACC: Secretary, Ministry of Heavy Industries, shioff@nic.in

For MAHA EV Mission: Chief Executive Officer, ANRF, ceo@anrf.gov.in

Dr. T. Thangaradjou, Programme Director, MAHA EV Mission, t.tradjou@anrf.gov.in

India's electric mobility transition is formed by various schemes and missions. These schemes and missions, when combined, form the policy architecture for electric vehicle adoption in India. They focus on research and innovation, providing financial support, and demand creation, with the National Electric Mobility Mission Plan 2020 providing the initial design and vision.

The National Electric Mobility Mission Plan (NEMMP) 2020 is the foundational vision document for the adoption and manufacturing of EVs in India. Under the umbrella of NEMMP (2020), several schemes and missions were initiated.

- PM E-DRIVE (PM Electric Drive Revolution in Innovative Vehicle Enhancement) was approved on 29th September 2024 as a demand incentive scheme for multiple EV segments. Additionally, the scheme also supports the deployment of charging infrastructure and the upgradation of testing facilities. The Ministry of Heavy Industries is the nodal agency responsible for the mission.

- The Production Linked Incentive Scheme for Advanced Chemistry Cell was launched in May 2021 to promote the manufacturing of ACCs to strengthen the electric mobility ecosystem. The Ministry of Heavy Industries is responsible for its implementation.

Mission for Advancement in High Impact Areas (MAHA)-EV, initiated by the Anusandhan National Research Foundation (ANRF), focuses primarily on research and development of electric-vehicle components in India. The mission supports research in batteries, motors, chargers, grid interfaces and other related components.

Budget

MAHA EV Mission has a performance-based funding mechanism. Funds will be allocated for short-term deliverables (3 years), followed by another 2 years based on performance in those deliverables. Under the mission, 10% of the project cost will be contributed by an industry partner as a co-founding member.

- The PM E-DRIVE scheme was launched in 2024 with a financial outlay of ₹ 10,900 crore (~US$ 1.16B[197]) for a two-year period (FY 2024-2026) and was subsequently extended up to 31 March 2028.

- The PLI Scheme for ACC has a budget of 18,100 crore (~US$ 1.92B).

[197] At exchange rate of US$ 1 = ₹94.01 (March 25, 2026).

Priorities

- The objective of the MAHA-EV Mission is to promote research and development in the EV sector to establish an indigenous ecosystem. The priority technological verticals under the mission are tropical EV batteries and battery cells, EV charging infrastructure, and power electronics, machines and drives (PEMD).
- PM E-DRIVE primarily focuses on supporting demand incentives for e-two-wheelers (e-2Ws), e-three-wheelers (e-rickshaws, e-carts, and L5 category), e-ambulances, and e-trucks. The scheme also supports the development of public charging infrastructure and the enhancement of testing facilities.
- The PLI Scheme for ACC aims to achieve 50 GWh of ACC manufacturing capacity

Implementation and Functional Architecture

a. MAHA EV Mission: The implementation architecture of the MAHA EV mission centres on its three technology verticals and the establishment of electric mobility nodes (e-Nodes) to support them.

- e-Nodes: The e-nodes will focus on at least one of the technology verticals under the mission and will comprise 3-4 academic or R&D institutions, with the option to add industrial partners working in the same technology domain. The nodes shall be responsible for cross-sectoral collaborations, patent demonstrations, and the provision of state-of-the-art facilities for prototyping and testing.

In 2025, ANRF selected seven e-nodes to provide support for the mission. The table below lists all the selected institutes along with their designated technology vertical.

S.No.	Name of the Lead Institute (e-node)	Technology Vertical
1	Indian Institute of Technology Banaras Hindu University, Varanasi	EV Charging Structure
2	International Advanced Research Centre for Powder Metallurgy and New Materials(ARCI), Hyderabad	Tropical EV Battery and Battery Cells
3	Indian Institute of Technology Bombay	Power Electronics, Machines and Drives
4	CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI), Pilani	Power Electronics, Machines and Drives
5	National Institute of Technology Karnataka, Surathkal	Power Electronics, Machines & Drives
6	Indian Institute of Technology Kanpur	EV Charging Infrastructure
7	Indian Institute of Technology Kharagpur	Tropical EV Battery and Battery Cells

Table 9: List of Institutions (E-Node)

The full list of institutes involved (including industrial partners), apart from the lead institutions, can be accessed through: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/may/doc202555550501.pdf

Technology Verticals: The technology verticals under the mission outline the broad R&D areas for EV development.

- Tropical EV Battery and Battery Cells: This vertical focuses on cell technologies and materials, implementation of batteries in EVs, and the battery circular economy.
- Power Electronics, Machines and Drives (PEMD): This vertical focuses on motors, power electronics, and motor control for EVs
- EV Charging Infrastructure: This vertical focuses on high-power charging methods, charging infrastructure and grid issues, and low-power charging methods.

b. PM E-DRIVE Scheme: The implementation strategy for the PM E-DRIVE Scheme includes providing subsidies, grants for the creation of capital assets, and administration of the scheme through information, education, and communication (IEC).

The strategy also includes a fee for the project management agency (PMA).

- Subsidies: The scheme provides demand-side incentives for EV adoption. It primarily targets electric two- and three-wheelers for commercial use, as well as privately or corporately owned electric two-wheelers. The scheme is also eligible for e-ambulances, e-trucks, and other emerging electric vehicles. For buyers, the incentive is a reduced purchase price.
- Grants for Creation of Capital Assets: The scheme provides funding to establish a network of charging stations, acquire e-buses, and enhance the ministry's testing facilities.

c. PLI Scheme for Advanced Chemistry Cells: The PLI Scheme is implemented via a competitive bidding process. Each selected firm must commit to at least 5 GWh of manufacturing capacity. After selection, the plant must be commissioned within two years; thereafter, the incentives are disbursed. This model ensures government-supported execution rather than an upfront capital subsidy.

International Outlook

Through international collaborations and engagements, India's priorities within the electric vehicles sector focus primarily on securing advanced battery technology, building charging infrastructure, and strengthening R&D to develop a resilient EV ecosystem. The ongoing missions and policies within the sector also target these aspects, such as the PM E-DRIVE

Scheme (for expansion of multiple EV segments and charging infrastructure) and MAHA EV (for R&D within the EV sector). These missions and their underlying priorities signal that India has moved beyond seeking market access for EV products and is now looking for collaborations to improve technologies and infrastructure.

- Bilateral engagements with the European Union (under EU Trade and Technology Council), Canada, and the United Kingdom also align with these priorities, focusing on collaborations on charging technologies, batteries, the critical mineral supply chain, and EV infrastructure. These engagements have served as knowledge partnerships, sources of investment, and technological collaborations.

Apart from these engagements, the investment platforms such as Bharat Mobility Global Expo have played a pivotal role in promoting collaborations and financial opportunities. India's commitment to expanding the EV sector was also visible during its G-20 presidency, wherein NITI Aayog's 4th Working Group on Energy Transitions focused on advancing public-private partnerships in the EV sector, along with development in urban mobility and sustainable transport. India is actively expanding its EV ecosystem through international collaborations, which could help expedite the sector's ongoing development.

XII. Mission Mausam

Point of Contact
Secretary, MoES,
secretary@moes.gov.in

Section Officer, Mission Mausam, psharma.edu@gov.in

URL
https://monsoon-mission.tropmet.res.in/mission-mausam

Mission Mausam was approved on September 11, 2024, with the vision of making India climate-resilient and weather-ready in line with international standards. The mission focuses primarily on timely and precise weather and climate observations, modelling, and the provision of forecasting information across multiple sectors.[198] The Ministry of Earth Sciences is the nodal agency for the mission, with its institutions, the India Meteorological Department (IMD), the Indian Institute of Tropical Meteorology (IITM), and the National Centre for Medium-Range Weather Forecasting (NCMRWF), tasked with implementation. Additionally, the mission is supported by MoES-aligned bodies such as the Indian National Centre for Ocean Information Services (INCOIS) and the National Institute of Ocean Technology (NIOT) [199].

Budget

The mission was approved with a budget of ₹ 2,000 crore (~US$ 240M) for a period of two years, starting from September 2024 till FY 2026 [200].

Priorities

The priority of the mission, as per mandate, is to make India "weather-ready and climate-smart". In terms of objectives, the mission focuses on developing advanced weather and climate technologies, such as establishing high-performance computing systems, improving Earth systems models using AI and ML, and deploying future-ready radars and satellites with advanced instrument payloads. Moreover, the mission aims to improve climate surveillance and observation methods by introducing higher-resolution atmospheric observations with enhanced temporal and spatial coverage [201].

[198] Press Information Bureau, "MISSION MAUSAM: Enhancing Weather and Climate Resilience for India." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2087273mission's priority, as per its &reg=3&lang=2&. [Accessed: Mar. 10, 2026].

[199] Press Information Bureau, "MISSION MAUSAM: Enhancing Weather and Climate Resilience for India." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2087273&reg=3&lang=2&. [Accessed: Mar. 10, 2026].

[200] Press Information Bureau, "Mission Mausam Unveiled: A 2,000 Crore initiative to Enhance India's Weather and Climate Forecasting by 2026." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2054427&reg=3&lang=2&text=The%20Union%20Cabinet%20approved%20Mission,'%20and%20'Climate%20Smart'. [Accessed: Mar. 10, 2026].

[201] India Meteorological Department, "Mission Mausam." [Online]. Available: https://mausam.imd.gov.in/event/mission_mausam.pdf. [Accessed: Mar. 10, 2026].

Implementation and Functional Architecture

The mission's implementation architecture comprises three key aspects: Infrastructure Development, Improving Supercomputing Power, and Collaborative Research and Public Outreach. To cover these aspects, the mission has a structured implementation mechanism. The table below lists the organisations involved in the mission

S. No	Name of the organisation	Area of focus	Point of Contact Details
1	India Meteorological Department (IMD)	Observation, decision support system, and information dissemination.	Director General - directorgeneral.imd@imd.gov.in
2	Indian Institute of Tropical Meteorology (IITM)	Field campaigns, process studies, and modelling	Director - surya@tropmet.res.in
3	National Centre for Medium-Range Weather Forecasting (NCMRWF)	Weather Prediction and Data Collection	Director vsprasad@ncmrwf.gov.in
4	Other Allied MoES institutes: Indian National Centre for Ocean Information Services (INCOIS), National Institute of Ocean Technology (NIOT), and National Centre for Polar and Ocean Research (NCPOR)	Support for Earth systems observations in the ocean and polar regions	Director (INCOIS) - director@incois.gov.in Director (NIOT) director.niot@gov.in Director (NCPOR) - director@ncpor.res.in
5	Central Water Commission (CWC), Geological Survey of India, and Defence Geoinformatics Research Establishment	Flood forecasting, landslides, and avalanches	Chairman (CWC) - chairman-cwc@nic.in Director General (GSI) - dg.gsi@gov.in

Table 10: List of organisations involved in Mission Mausam with area of focus

In terms of strategy for infrastructural development, the main focus is the installation and development of Doppler Weather Radars (DWRs), Automatic Weather Stations (AWS), and rain gauges.

The mission has already started translating the devised strategy by expanding the existing radar coverage and deploying new prediction technologies:

1. Doppler Weather Radar has expanded from 14 operational units in 2014 to 51 units covering 87% of the country. 50 more DWRs are in the pipeline as part of the mission[202].

2. High-performance computing systems have been established at IITM & NCMRWF[203].

[202] Ministry of Earth Sciences, "India's Weather Forecasting Becomes a Way of Life with Expansion of Doppler Radar Network: Union Minister Dr. Jitendra Singh," Press Information Bureau, Apr. 29, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2256637&reg=3&lang=2.

[203] Press Information Bureau, "Parliament Question: Mission Mausam," Dec. 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2205865&lang=2&reg=3.

3. A coastal atmospheric research testbed has been established at Andhra University by IITM Pune as part of the mission with an investment of ₹ 180 crores [204].

4. NIOT has developed a 16 kg high-altitude hexacopter drone, capable of reaching 5 km altitude, with field trials collecting data up to 4 km over the Pamanji coast under Mission Mausam [205].

For public outreach, the Mausam App shall serve as the primary source of information [206]. Partnerships with organisations such as the World Meteorological Organisation are a focal point for international collaboration.

Relevant Documents

Mission Mausam Framework: The mission framework defines the central goal and purpose of the mission along with its components and illustrates the initial implementation strategy to achieve the same. It also mentions that the mission will be running in two phases: Phase I (2024-26) and Phase II (2026-31). Moreover, it details the mission's outcomes, along with the functional institutional mechanism put in place [207].

[204] The Times of India, "Mission Mausam: Andhra University to Host 180 Crore Coastal Research Testbed," May 2026. [Online]. Available: https://timesofindia.indiatimes.com/city/vijayawada/mission-mausam-andhra-university-to-host--180-crore-coastal-research-testbed/articleshow/130721392.cms .

[205] Drone Federation India, "NIOT Completes First Field Trials of High-Altitude Drone for Mission Mausam Weather Research," May 2026. [Online]. Available: https://www.dronefederation.in/media-hub/niot-drone-trials-under-mission-mausam.

[206] Press Information Bureau, "Mission Mausam Unveiled: A 2,000 Crore initiative to Enhance India's Weather and Climate Forecasting by 2026." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2054427&reg=3&lang=2&text=The%20Union%20Cabinet%20approved%20Mission,'%20and%20'Climate%20Smart'. [Accessed: Mar. 10, 2026].

[207] India Meteorological Department, "Mission Mausam." [Online]. Available: https://mausam.imd.gov.in/event/mission_mausam.pdf. [Accessed: Mar. 10, 2026].

XIII. National Critical Minerals Mission

Point of Contact
Secretary, Ministry of Mines, secy-mines@nic.in

Director, National Critical Mineral Mission, mohd.sadiq.gsi@gov.in

URL
https://mines.gov.in/webportal/content/national-critical-mineral-mission

The National Critical Minerals Mission was launched in 2025 for a seven-year period, from 2024-25 to 2030-31. It is India's flagship mission to secure the critical minerals supply chain and strengthen the domestic value chain to achieve self-reliance in the critical minerals sector. The mission is being led and executed by the Ministry of Mines in collaboration with the Geological Survey of India (GSI). The GSI is tasked with exploration projects for the assigned period.

Budget

The Mission was approved with a financial outlay of ₹ 16,300 crore (~US$ 1.9B) for a period of seven years, from 2024-25 to 2030-31 [208].

The table below illustrates the distribution of approved financial outlay across various components under the mission:

S.No	Components receiving investments under the mission	Allocated Government Expenditure (in crore)
1	Domestic Exploration through National Mineral Exploration Trust (NMET)	₹ 3000
2	Domestic Exploration through GSI	₹ 4000
3	Support for foreign exploration activities through NMET	₹ 1600
4	Critical Mineral Recycling Incentive Scheme	₹ 1500
5	Pilot Projects for Mineral Recovery	₹ 100
6	R&D and Human Resource Development	₹ 500
7	International R&D Support	₹ 500
8	Skill Development Centre	₹ 100
9	Critical Mineral Processing Parks	₹ 500
10	Stockpiling of Critical Minerals	₹ 500

Table 11: Distribution of approved financial outlay across components

[208] Press Information Bureau, "India's Critical Mineral Mission: Securing the Minerals of Tomorrow." [Online]. Available: https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155158&ModuleId=3&reg=3&lang=2&~:text=In%20January%202025%2C%20India%20responded,(PSUs)%20and%20other%20stakeholders. [Accessed: Mar. 9, 2026].

Apart from the mission budget, the mission is expected to receive investments worth ₹18,000 crore via PSUs and private entities. Private investments are primarily being channelled into exploration activities and the procurement of mining equipment. For example, as a part of the Mineral Security Partnership, India has recently facilitated a public-private partnership for a lithium project in Brazil. Altmin, an India-based battery manufacturer, has entered into this deal worth USD 250 million [209].

Objective

The Mission has two overarching objectives: first, to secure critical mineral supply chains by capturing availability from domestic and international sources, and second, to strengthen the domestic ecosystem by fostering research, innovation, and global competitiveness in exploration, mining, and processing. To achieve these objectives, the mission has predefined targets, including achieving 1000 patents in the critical mineral value chain, establishing three mineral processing parks and four centres of excellence, and establishing 1200 domestic critical mineral exploration projects.

The full list of specified targets under NCMM can be accessed at: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2120525&reg=3&lang=2

Implementation and Functional Architecture

The mission's implementation and functional structure focus on components and initiatives related to increasing domestic production, acquiring critical mineral assets abroad, recycling critical minerals, and advancing scientific and technological capabilities for critical minerals.

a. Exploration and auction of critical mineral blocks

Contact info
Director General, GSI,
dg.gsi@gov.in
Director General, NMET,
nmet-mines@gov.in

The government of India has tasked the Geological Survey of India and the National Mineral Exploration Trust with exploring critical mineral blocks to achieve 1200 exploration projects within the next seven years, from 2024-25 to 2030-31. The two organisations, combined, have taken over 523 exploration projects as of January 10, 2026[210]. Private entities have also been mandated for such exploration activities. Under the National Mineral Exploration and Development Trust, 57 mineral exploration projects have been sanctioned to Notified Private Exploration Agencies, or NPEAs; of these, 31 relate to critical minerals and 26 to non-critical minerals.

[209] The Times of India, "Altmin's Lithium Refinery in Brazil Becomes First Indian Project to be Listed with MSP," Sep. 2025. [Online]. Available: https://timesofindia.indiatimes.com/city/hyderabad/altmins-lithium-refinery-in-brazil-becomes-first-indian-project-to-be-listed-with-msp/articleshow/123772229.cms.

[210] Ministry of Mines, "National Critical Mineral Mission (NCMM)." [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM'_1768030756.pdf?. [Accessed: Mar. 9, 2026].

b. Setting up of Critical Mineral Processing Parks

Contact info
Contact Information of IREL: contactus@irel.co.in

The mission framework proposes establishing 04 critical mineral processing parks to reduce the country's dependence on international processing facilities. A financial outlay of ₹ 500 crore (US$ 53.21M) over a seven-year period has been proposed for the same [211].

Indian Rare Earths Ltd. (IREL), a PSU of the Department of Atomic Energy (DAE), contributes to domestic mineral processing with its processing capacity of ₹10 Lakh tonnes per annum [212]. To promote international partnerships, the government has proposed a basic customs duty exemption for the import of capital goods required for processing critical minerals (Union Budget 2026-27).

c. Overseas Critical Mineral Assets Exploration

Contact info
Director General, NMET, nmet-mines@gov.in

The government will support PSUs and private firms to conduct exploration activities in foreign critical mines. PSUs have been tasked with 26 such explorations, whereas private entities have been tasked with 24.

KABIL (Khanij Bidesh India Ltd.) has emerged as a major player in this regard, securing 5 brine-type lithium blocks in Argentina and signing an MoU with Australia for 5 lithium projects [213].

Apart from KABIL, the mission framework enlists some of the major PSUs for the same purpose: Coal India Ltd. (CIL), National Mineral Development Corporation (NMDC), NTPC Mining Ltd, Neyveli Lignite Corporation India Ltd (NLCIL), Steel Authority of India (SAIL), Indian Rare Earth Ltd (IREL). Oil India Ltd, ONGC Videsh Ltd (OVL). National Mineral Exploration Trust is responsible for providing support to PSUs and private entities for these exploration activities.

d. Incentivisation Scheme for Recycling

Contact info
Chairman, CPCB, ccb.cpcb@nic.in

The recycling incentive scheme focuses on enhancing recycling capacity to recover critical minerals from secondary sources, including e-waste, vehicle parts, and lithium-ion battery scrap. The

[211] Ministry of Mines, "National Critical Mineral Mission (NCMM)," Jan. 2025. [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM_1739251643.pdf.

[212] Press Information Bureau, "National Critical Mineral Mission: Powering India's Clean Energy Future." [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2120525&reg=3&lang=2&. [Accessed: Mar. 9, 2026].

[213] Ministry of Mines, "National Critical Mineral Mission (NCMM)." [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM'_1768030756.pdf?. [Accessed: Mar. 9, 2026].

initiative envisions establishing a 400-kiloton annual recycling capacity, with a budget of ₹ 1,500 crore (US$ 159.64M) [214].

As of April 30th 2026, the government has approved 58 private companies for this. The private entities have committed to 850 KTPA of recycling capacity with an investment of approximately ₹5,000 crore [215].

Central Pollution Control Board (CPCB) is the compliance backbone for this scheme. Recyclers must obtain CPCB EPR registration and submit proof of their application to avail incentives[216]. For recovery of critical minerals from tailings, red mud and fly ash, the government has already approved one project of Non Ferrous Technology Development Centre (NFTDC).

e. Establishment of Centres of Excellence and Development of technologies for extraction, recycling, and processing

Contact info
Materials (materials@nftdc.res.in), Finance (finance@nftdc.res.in).

To support research and innovation in the sector, the ministry has recognised 09 CoEs. This includes IIT Bombay, IIT Hyderabad, IIT (ISM) Dhanbad, IIT Roorkee, CSIR–IMMT Bhubaneswar, CSIR–NML Jamshedpur, NFTDC Hyderabad, IISc Bangalore and C-MET Hyderabad.[217] Following a hub and spoke model, these 9 CoEs have 90 spokes, which are mainly R&D and academia institutions.

Funding for R&D will be provided through Anusandhan National Research Foundation (ANRF) [218].

Under the ANRF Critical Mineral Research Programme, a dedicated funding of ₹ 210 crore has already been sanctioned for R&D purposes. In addition, to achieve self-sufficiency, the mission envisions generating 1,000 patents across the critical-minerals value chain by 2031 [219].

[214] Ministry of Mines, "National Critical Mineral Mission (NCMM)," Jan. 2025. [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM_1739251643.pdf.

[215] Ministry of Mines, "India Advances Critical Mineral Security: 58 Companies Eligible for Recycling Scheme," Press Information Bureau, Apr. 30, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2256977

[216] Ministry of Mines, "Scheme Guidelines for Critical Mineral Recycling Incentive Scheme," Sep. 8, 2025. [Online]. Available: https://nfmrecycling.jnarddc.gov.in/assets/pdf/SCHEME_GUIDELINES.pdf?.

[217] Press Information Bureau, "Mines Ministry Recognizes Seven Centres of Excellence to work under the National Critical Mineral Mission." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2151287&reg=3&lang=2&. [Accessed: Mar. 9, 2026]. Press Information Bureau, "Ministry of Mines Recognizes Two more Centres of Excellence under the National Critical Mineral Mission." [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2182381&reg=3&lang=2. [Accessed: Mar. 16, 2026].

[218] Ministry of Mines, "National Critical Mineral Mission (NCMM)," Jan. 2025. [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM_1739251643.pdf.

[219] Ibid 133

f. NCMM Outreach Forum

Contact info
CEO, ANRF,
ceo@anrf.gov.in

The NCMM Outreach Forum was launched in 2025 as a cross-industry platform for stakeholders from all relevant domains to facilitate investment opportunities and strategic discussions [220].

Relevant Documents

National Critical Mineral Mission Framework: The National Critical Mineral Mission Framework is the core policy document for the mission, enlisting its vision, objectives, components, and outcomes. It highlights India's international outlook and comparative advantage emerging from the development of the critical mineral sector. Moreover, it also provides an implementation roadmap for the mission [221].

Guidelines for Critical Mineral Recycling Incentive Scheme: The guidelines for the incentive scheme set out the qualification criteria for such incentives. In the definition section, the guidelines specify the target segments eligible for recycling: spent LIBs (lithium-ion batteries), E-waste, and other waste streams (including wind turbines, EVs, medical equipment, etc.). The guidelines also illustrate the capex and opex incentive allocation mechanism [222].

Guidelines for the Centre of Excellence under NCMM: The guidelines for the CoE under NCMM were released in April 2025, focusing on the mission's R&D component. The guidelines specify the elements of a CoE, including its mission, eligibility conditions, and functions. Moreover, the guidelines outline the procedure for CoE recognition and the approval process [223].

Mines and Minerals (Development and Regulation) Amendment Act, 2026: The MMDR Amendment Act, 2026, strengthens the enabling legislative framework for mineral exploration, development, and the critical mineral ecosystem. It complements the National Critical Minerals Mission by supporting reforms to the wider regulatory and institutional framework for mineral resource development [224].

[220] Ministry of Mines, "Press Release." [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/Press_Release_Press_Information_Bureau_1750740362.pdf. [Accessed: Mar. 7, 2026].

[221] Ministry of Mines, "National Critical Mineral Mission (NCMM)," Jan. 2025. [Online]. Available: https://mines.gov.in/admin/storage/ckeditor/NCMM_1739251643.pdf.

[222] Ministry of Mines, "Scheme Guidelines for Critical Mineral Recycling Incentive Scheme," Sep. 8, 2025. [Online]. Available: https://nfmrecycling.jnarddc.gov.in/assets/pdf/SCHEME_GUIDELINES.pdf?.

[223] Ministry of Mines, "Guidelines for Centre of Excellence under National Critical Mineral Mission (NCMM)," Apr. 16, 2025. [Online]. Available: https://mines.gov.in/admin/download/680625356323c1745233205.pdf?.

[224] Press Information Bureau, "MMDR Amendment Act, 2026." [Online]. Available: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/aug/doc2026818962501.pdf. [Accessed: Aug. 19, 2026].

International Outlook

Through the National Critical Mineral Mission (NCMM), the focus is on building a resilient domestic critical mineral supply chain by engaging in global mineral partnerships and exploring foreign mineral blocks. Investment promotion and the exchange of expertise and knowledge for technological development remain key enablers for achieving the envisioned priorities.

- PSUs such as KABIL have already established agreements for mineral block exploration in Argentina, attesting to India's ongoing engagements within the domain[225].

- Bilateral engagements with Canada and Australia, focusing on building a resilient supply chain, promoting investment, and exchange of knowledge, further signal this inclination[226].

Through active engagement at multilateral forums such as the Mineral Security Partnership (MSP) and the Future Minerals Forum, India has advocated for international collaboration and global investment in R&D to establish an indigenous critical-mineral ecosystem.

[225] Press Information Bureau, "KABIL is exploring opportunities for acquisition of overseas critical minerals assets in Argentina, Australia and Chile." [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039606&reg=3&lang=2. [Accessed: Mar. 9, 2026].

[226] Press Information Bureau, "India-Canada Joint Leaders' Statement." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2234572&reg=6&lang=11&. [Accessed: Mar. 9, 2026]. Press Information Bureau, "KABIL is exploring opportunities for acquisition of overseas critical minerals assets in Argentina, Australia and Chile." [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039606&reg=3&lang=2. [Accessed: Mar. 9, 2026].

XIV. National Technical Textiles Mission

Point of Contact
Secretary, Ministry of Textiles, secy-textiles@nic.in
Mission Coordinator, National Technical Textiles Mission, manisha.chatterjee@gov.in
Mission Director, National Technical Textiles Mission, malhotra.a@gov.in

URL
https://nttm.texmin.gov.in/

The National Technical Textiles Mission was launched in FY 2020-21 to promote innovation and expand domestic use of technical textiles, thereby creating an indigenous ecosystem [227].

The Ministry of Textiles is the nodal agency responsible for the overall implementation and coordination of the mission.

Budget

The mission was announced with a financial outlay of ₹ 1.480 crore (US$ 157.61M) in the FY 2020-21, with a five-year period, which was later extended till March 2026 [228].

Apart from the mission's financial outlay, the government also introduced a PLI scheme for textiles with an outlay of ₹ 10,683 crore. The PLI scheme supports the production of man-made fabrics and technical textile products.

The recent round of the PLI, which closed in April 2026, had committed investments of ₹ 6,708 crore from private entities[229].

Priorities

The NTTM aims to position India as a global leader in technical textiles by strengthening research, domestic demand, exports and skilled human resources in the sector. The priorities are to promote the research, innovation, and development of speciality fibres and high-performance technical textile products [230].

[227] National Technical Textiles Mission, "National Technical Textiles Mission – About Mission." [Online]. Available: https://nttm.texmin.gov.in/PI/AboutMission.

[228] Press Information Bureau, "National Technical Textiles Mission (NTTM)." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115710&reg=3&lang=2. [Accessed: Mar. 15, 2026].

[229] Press Information Bureau, "52 New Applications Approved under Production Linked Incentive (PLI) Scheme for Textiles," Apr. 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2250951&reg=3&lang=2. Press Information Bureau, "Allocation of Funds to PLI Scheme," Aug. 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2152545&lang=2&reg=3.

[230] National Technical Textiles Mission, "National Technical Textiles Mission – About Mission." [Online]. Available: https://nttm.texmin.gov.in/PI/AboutMission.

Implementation and Functional Architecture

The implementation architecture of the mission has four key components:

a. Component I: Research, Innovation, and Development

NTTM supports research on high-performance fibres and smart, sustainable technical textiles. Through research and innovation, the mission promotes the application of these fibres in defence, aerospace, and other strategic areas.[231] The R&D component has a financial allocation of ₹ 1,000 crores.[232]

The Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles (GREAT) Scheme: The scheme, launched in 2023, helps transform prototypes into commercially viable products by providing funding to educational institutions and startups. Approved startups under the scheme receive support of ₹ 50 lakhs [233].

A total of 31 startups have been granted support under the mission as of March 2026, with a total cost of ₹ 15.4 crore [234]. Apart from startups, a total of 168 R&D projects have been approved under the mission, with 16 new projects approved in February 2026. In addition to this, an adjacent scheme, Tex RAMPS, has been launched with a financial outlay of ₹ 305 crore for the period of 5 years from FY 2025-26 to 2030-31.

b. Component II: Promotion and Market Development

Contact info
Director General, BIS,
dg@bis.gov.in
Head of Textiles
Department, BIS,
txd@bis.gov.in

This component of the scheme focuses on domestic adoption of technical textiles. For this purpose, it leverages policy tools such as awareness-raising, promotion of application in priority sectors and public infrastructure, and standardisation. For the standardisation of technical textiles, the textile department of the Bureau of Indian Standards is the responsible agency. Since the launch of NTTM, over 200 BIS Standards related to technical textiles have been developed[235].

[231] Ibid 145

[232] Press Information Bureau, "National Technical Textiles Mission (NTTM)." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115710&reg=3&lang=2. [Accessed: Mar. 15, 2026].

[233] National Technical Textiles Mission, "Revised GREAT Guidelines," Dec. 26, 2024. [Online]. Available: https://nttm.texmin.gov.in/pdf/WhatsNew/Revised%20GREAT%20guidelines.pdf.

[234] Ministry of Textiles, "National Technical Textiles Mission," Press Information Bureau, Mar. 10, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2237708&reg=3&lang=2.

[235] Press Information Bureau, "National Technical Textiles Mission (NTTM)." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115710&reg=3&lang=2. [Accessed: Mar. 15, 2026].

c. Component III: Export Promotion

Contact info
info@matexil.org

Through market access initiatives, quality upgradation, and conformity assessment, the mission enhances India's export competitiveness within the technical textiles domain. A financial outlay of ₹ 10 crores has been provided for the same [236].

Manmade and Technical Textiles Export Promotion Council (MATEXIL) is designated as the export promotion council for technical textiles under the mission [237].

d. Component IV: Education, Training, and Skill Development

This component of NTTM focuses on internships, special educational programs, and human resource development to promote skills training and development. ₹ 400 crores have been allocated under the scheme for this component. Skill Development Programmes: The programmes promote skill development through 12 industry-focused courses developed by organisations such as SITRA (South India Textiles Research Association), NITRA (Northern India Textile Research Association), and SASMIRA (The Synthetic & Art Silk Mills' Research Association) [238].

Relevant Documents

GREAT Startup Guidelines: This set of guidelines covers all the rules that must be followed to avail the benefits under the scheme. It mentions the eligibility criteria, funding procedures, selection procedure, and thrust areas for startups to assess before applying for the scheme.

Guidelines for Promotion and Market Development Assistance of Technical Textiles: The guidelines list down regulations related to the execution of domestic and international events for the promotion and market development assistance of technical textiles. It outlines the application procedure and funding rules, and provides the format for utilisation and cost account certificates.[239]

[236] Press Information Bureau, "National Technical Textiles Mission (NTTM)." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115710&reg=3&lang=2. [Accessed: Mar. 15, 2026].

[237] Ministry of Textiles, "Compendium of National Technical Textiles Mission (NTTM) 2024." [Online]. Available: https://nttm.texmin.gov.in/pdf/NewsLetterAndReport/Compendium%20NTTM%202024.pdf. [Accessed: Mar. 9, 2026].

[238] Press Information Bureau, "National Technical Textiles Mission (NTTM)." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115710&reg=3&lang=2. [Accessed: Mar. 15, 2026].

[239] National Technical Textiles Mission, "Guidelines for Promotion and Market Development of Technical Textiles under NTTM (PRAMAN)." [Online]. Available: https://nttm.texmin.gov.in/pdf/Circulars/Guidelines%20for%20Promotion%20and%20Market%20Development%20of%20Technical%20Textiles%20under%20NTTM%20%28PRAMAN%29%20%281%29.pdf?. [Accessed: Mar. 16, 2026].

IPR Guidelines for R&D: The guidelines provide a framework for handling intellectual property in the context of research projects created under the mission. The guidelines outline applicable terms and conditions and provide a systematic approach to commercialisation and industrial participation. The guidelines highlight four specific situations and illustrate how IPR would apply in each in the context of NTTM [240].

International Outlook

Through the National Technical Textile Mission, India has strengthened its R&D capabilities and gained global market access. India's technical textile exports were recorded at USD 2.9 billion in FY 2024-25, an increase of nearly 15% from the previous year [241]. For India, the focus through international engagements is to gain market access, promote investment opportunities in man-made and speciality fibres, ensure quality as per global standards, and collaborate on advancing domestic R&D and testing capabilities.

- International engagements with Japan, the UAE, and the United Kingdom emphasise similar priorities. Partnership with Japan's Nissenken Quality Evaluation Centre in 2020 focused on testing the quality of domestic technical textiles as per global standards [242]. With the United Kingdom and the UAE, the engagement targeted investments in the sector along with technology cooperation and knowledge exchange [243].

A stronger push towards international cooperation is provided through the Bharat TEX Show, which is a global platform for textile exhibitions where stakeholders from all relevant industries engage and collaborate, providing India with an opportunity for international exposure and investment [244].

[240] National Technical Textiles Mission, "IPR Guidelines," Nov. 2024. [Online]. Available: https://nttm.texmin.gov.in/pdf/WhatsNew/IPR%20Guidelines.pdf?.

[241] IPress Information Bureau, "India Responding to Global Textile Demand with Strength and Confidence: MoS Pabitra Margherita." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2191886. [Accessed: Mar. 9, 2026].

[242] Press Information Bureau, "Cabinet approves MoU between India and Japan for cooperation in the field of good quality textiles." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1650634&reg=3&lang=2. [Accessed: Mar. 16, 2026].

[243] Press Information Bureau, "High-Level Saudi Delegation Engages with Indian Textile Leadership to Boost Sectoral Collaboration." [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2179087&reg=3&lang=2. [Accessed: Mar. 16, 2026].

[244] Bharat Tex, "Bharat Tex 2026 | World's Largest Textile Trade Fair." [Online]. Available: https://bharat-tex.com/. [Accessed: Mar. 17, 2026].

4.2 Policies

I. Biotechnology for Economy, Environment and Employment (BioE3)

Point of Contact
Secretary, Department of Biotechnology:
secy.dbt@nic.in

Coordinator, DBT,
anamika@dbt.nic.in

Nodal Officer, DBT,
vaishalip.dbt@nic.in

The BioE3 Policy was approved on 24 August 2024 and is anchored by the Department of Biotechnology (DBT), Ministry of Science and Technology. It is intended to promote high-performance biomanufacturing and to leverage biotechnology to drive economic growth, environmental sustainability, and job creation.

Its implementation is organised around six thematic sectors: bio-based chemicals, biopolymers and enzymes; smart proteins and functional foods; precision biotherapeutics; climate-resilient agriculture; carbon capture and utilisation; and marine and space research. The policy also emphasises skill development, training, and job creation, including through new biomanufacturing infrastructure [245].

Objectives

The policy's objectives primarily focus on establishing an advanced biomanufacturing ecosystem in the country to make India a global biomanufacturer.

The following are the objectives listed as part of the policy:

- Scaling up commercialisation of high-value bio-based products
- Promotion of circular bioeconomy to advance green growth
- Enabling technology platforms such as Bio AI Hubs and Biofoundries and creating infrastructure such as Biomanufacturing Hubs to support large-scale application of bio-based technologies across critical sectors.

[245] Department of Biotechnology, "BioE3 Policy." [Online]. Available: https://bmi.dbtindia.gov.in/pdf/folder.pdf. [Accessed: Mar. 16, 2026].

International Outlook

The policy, by its design, provides a push towards international engagements to scale biomanufacturing. The vision of making India a global bio-manufacturing hub requires achieving competitive global production and aligning with international standards to ensure safety. To achieve this vision, international engagements focusing on technology transfers, market access, and exchange of academic knowledge have become a given priority under the policy. For India, these engagements will not only scale up domestic production but also enable the creation of a global value chain that benefits the international community.

- India dedicated a publicly funded biofoundry at the International Centre for Genetic Engineering and Biotechnology (ICGEB) board meeting in 2025. This contribution showcased India's proactivity at the international level, as ICGEB is a 69-member-country community that provides a platform for research, technology transfer, and international cooperation.

- BIRAC's recent call for engagement in futuristic marine research and carbon capture under the policy further illustrates its willingness to connect with the global research network.

Wider biotechnology engagements with international partners are already in progress through DBT, ensuring holistic development of the sector. With BioE3 in place, these wider engagements potentially can also explore components related to biomanufacturing for long-term partnerships.

II. Geospatial Policy 2022

Point of Contact
Secretary, Department of Science and Technology: dstsec@nic.in

Head, Geospatial Innovation Cell, Department of Science & Technology, k.gopikrishna@nic.in.

The National Geospatial Policy 2022[246] was notified by the Department of Science and Technology (DST), under the Ministry of Science and Technology, Government of India. It provides the framework for the geospatial sector and aims to position India as a global leader in geospatial science, technology, and innovation.

In November 2024, DST launched Operation Dronagiri, a pilot initiative under the policy to demonstrate practical geospatial use cases in agriculture, livelihoods and skilling, and transport and infrastructure across selected districts in a few Indian states [247]. Alongside this, the Integrated Geospatial Data Sharing Interface (IGDI) is being used as a data exchange, and the National Geospatial Data Repository is being developed to improve interoperability and access. In addition, the National Geospatial Mission was announced in the Union Budget 2025–26 to build foundational geospatial infrastructure and data.

Objectives

The policy aims to strengthen the geospatial ecosystem of the country to support the formation of a robust information economy by achieving the following objectives:

- Democratising access to geospatial data and services for citizens to increase adoption across various sectors. The development of a unified digital interface, along with an enabling legal framework, is a key priority within this objective.
- Promoting research, innovation and technology development within the geospatial sector to create an advanced domestic geospatial ecosystem. Framing a redefined National Geodetic Framework, creating a high-accuracy geoid model, developing a high-accuracy digital elevation model, and establishing a geospatial knowledge infrastructure are focus areas under this objective.

[246] Department of Science & Technology (DST), "National Geospatial Policy, 2022," The Gazette of India: Extraordinary, Dec. 28, 2022. [Online]. Available: https://dst.gov.in/sites/default/files/National%20Geospatial%20Policy.pdf.

[247] Department of Science & Technology, "Operation Dronagiri launched along with GDI marking a milestone in the National Geospatial Policy." [Online]. Available: https://dst.gov.in/operation-dronagiri-launched-along-gdi-marking-milestone-national-geospatial-policy. [Accessed: Mar. 16, 2026].

- Mapping of existing infrastructure for national development. Surveying and mapping of sub-infrastructure in major cities and generating high-resolution bathymetric geospatial data for inland waters to support the blue economy are key priorities within this objective.

International Outlook

The policy seeks to make India a global leader in the geospatial sector and aligns national geospatial development with global best practices. It refers to the Integrated Geospatial Information Framework (IGIF) of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) as an important reference point for strengthening India's spatial information management systems [248].

It also includes standards, interoperability, data governance, and institutional alignment with globally accepted frameworks. The policy supports an approach in which India expands domestic geospatial capacity while also improving its ability to engage with international geospatial ecosystems, technologies, and best practices.

[248] Department of Science & Technology, "National Geospatial Policy, 2022." [Online]. Available: https://dst.gov.in/sites/default/files/National%20Geospatial%20Policy.pdf. [Accessed: Mar. 16, 2026].

III. Indian Space Policy 2023

Point of Contact
Secretary, Department of Space; Chairman, ISRO; and Chairman, Space Commission.
chairmanoffice@isro.gov.in

The Government of India released the Indian Space Policy-2023 as the framework for the space sector on 20th April 2023. It was issued to establish regulatory certainty after the 2020 space sector reforms and to create a level playing field for non-government entities (NGEs). The policy aims to strengthen national space capabilities, promote commercial participation, leverage space to drive technology development, and support socio-economic development, security, and the peaceful exploration of outer space.

The Indian Space Policy-2023 defines the roles of three institutions within India's space ecosystem: Indian National Space Promotion and Authorisation Centre (IN-SPACe), Indian Space Research Organisation (ISRO), and NewSpace India Limited (NSIL) [249].

Objectives

The India Space Policy 2023 aims to strengthen India's capabilities, enhance private-sector participation, and promote innovation and commercial activities across the space economy. It seeks to establish a regulatory framework, enhance research and development and encourage space-related entrepreneurship. It also emphasises the application of space technologies to national development priorities, international cooperation, environmental protection, national security and peaceful space exploration. [250].

International Outlook

The India Space Policy 2023 places emphasis on international engagements within the space sector for the commercialisation of space products and science-led space cooperation. The policy states that international relations in the space sector are to be pursued, with IN-SPACe as the responsible authority for international commercial engagements and ISRO for research and technology partnerships. The expansion of space product exports, overseas investments, research and innovation, and the advancement of frontier missions and human spaceflight stand as focus areas for collaboration.

[249] Indian Space Research Organisation, "Indian Space Policy - 2023." [Online]. Available: https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf. [Accessed: Mar. 16, 2026].

[250] Department of Space, Government of India, "Indian Space Policy - 2023," Indian Space Research Organisation, Bengaluru, India, 2023. [Online]. Available: https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf.

In the space sector, India's strength stems from its low-cost mission delivery, increasing private-sector involvement, and a mature commercial ecosystem with Inspace and NSIL in place. The new space policy leverages these strengths and provides scope for international partnerships in private manufacturing, satellite launches, and navigation applications.

Existing international engagements, such as partnerships with organisations like NASA, CNES, and JAXA, further showcase India's ongoing pursuit of becoming a global space service provider. These engagements are a testament to India's invitation of international partners not just as customers or technology providers, but as long-term collaborators in mission development, services, and innovation.

IV. National Education Policy 2020

Point of Contact
Secretary, Department of Higher Education, MoE, secy.dhe.nic.in.

India's National Education Policy 2020 remodels education as the foundation of a science-driven and innovation-oriented society. It shifts the system away from rote learning towards conceptual understanding, critical thinking, creativity, scientific temper, and evidence-based reasoning. It also treats multidisciplinary education as essential to knowledge creation, recognising that future scientific and technological progress will increasingly emerge at the intersection of disciplines.

Priorities

For science, technology and innovation, the NEP seeks to:

- Cultivate a scientific temper and evidence-based thinking across the education system while strengthening creativity, logical reasoning, problem-solving, digital literacy, coding, and computational thinking as core learner capabilities.
- Shift teaching and learning from rote methods to conceptual understanding, inquiry, discovery, and innovation so that education supports scientific thinking and adaptability in a rapidly changing technological environment.
- To promote multidisciplinary knowledge creation by building flexible and holistic learning pathways across the sciences, social sciences, humanities, technical, and vocational fields,
- Strengthen research capacity in universities and colleges. NEP 2020 envisaged a National Research Foundation; the subsequent Anusandhan National Research Foundation Act, 2023, established the statutory framework for ANRF.
- Translate knowledge creation into innovation and application through start-up incubators, technology development centres, interdisciplinary research, stronger industry-academic linkages, and closer interfaces between researchers, government, and industry.
- Support the responsible use of technology in education by promoting technology-based interventions only when they have been rigorously evaluated, and by building institutional capacity for informed decisions about educational technology through the National Educational Technology Forum.

International Outlook

NEP 2020 advances higher education through internationally relevant curricula in the sciences; student mobility to study, transfer credits, and research at institutions abroad; and faculty/ student exchanges with foreign institutions. It also provides for mutually beneficial MoUs with foreign countries, permits credits acquired at foreign universities to be counted towards the award of a degree, where appropriate, and envisages facilitating selected universities among the top 100 in the world to operate in India. This policy is being operationalised through the UGC (Academic Collaboration between Indian and Foreign Higher Educational Institutions to offer Twinning, Joint Degree and Dual Degree Programmes) Regulations, 2022, which provide a formal framework for joint and dual degree programmes [251]. It is further supported by national initiatives such as the Scheme for Promotion of Academic and Research Collaboration (SPARC)[252], which promotes academic and research collaboration between Indian institutions and leading institutions across the globe, and the Global Initiative of Academic Networks (GIAN)[253], which seeks to tap the talent pool of scientists and entrepreneurs from abroad to augment India's academic resources. Through these measures, India is deepening international cooperation in education, research, and innovation.

[251] University Grants Commission (UGC), "University Grants Commission (Academic Collaboration between Indian and Foreign Higher Educational Institutions to offer Twinning, Joint Degree and Dual Degree Programmes) Regulations, 2022," May 2, 2022. [Online]. Available: https://www.ugc.gov.in/pdfnews/4555806_UGC-Acad-Collab-Regulations.pdf.

[252] Ministry of Education and Indian Institute of Technology Kharagpur, "Scheme for Promotion of Academic and Research Collaboration (SPARC)," Mar. 12, 2026. [Online]. Available: https://sparc.iitkgp.ac.in/.

[253] Science and Engineering Research Board (SERB), "GIAN initiative," VAJRA-India. [Online]. Available: https://www.vajra-india.in/index.php/fellowships/gian-initiative. [Accessed: Apr. 17, 2026].

V. National Policy on Electronics 2019

Point of Contact
Secretary, Ministry of Electronics and Information Technology, Govt of India.
secretary@meity.gov.in

The National Policy on Electronics 2019 (NPE 2019) was notified by the Ministry of Electronics and Information Technology (MeitY) on 25 February 2019. It replaced the earlier National Policy on Electronics 2012. The policy's vision is to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by strengthening domestic capabilities in core components, including chipsets, and by creating a more competitive policy environment for the sector[254].

Objectives

The objectives of the policy centre around three major areas: electronics systems design and manufacturing (ESDM), export promotion, and the formation of core electronics components.

- Developing domestic capabilities in ESDM and leveraging a competitive global environment to position India as a global hub.
- Increasing capacity for core inputs, such as semiconductors and chipsets, to strengthen indigenous manufacturing.
- Reducing import dependence by growing the domestic manufacturing market.

International Outlook

NPE 2019 focuses on strengthening India's position in the global electronics value chain. The policy's emphasis on building domestic capabilities and increasing exports acts as an underlying factor towards international engagements. In effect, this makes technology inflows, market access, and global competitiveness key areas of cooperation within the sector. This further extends to collaborating with global manufacturing bases for components, attracting foreign investment, and cultivating international partnerships for innovation and research.

- With the inclusion of the Electronic Component Manufacturing Scheme (ECMS), India has supplemented its ongoing progress, which was initiated with NPE 2019.

[254] Ministry of Electronics and Information Technology (MeitY), "National Policy on Electronics 2019 (NPE 2019)," The Gazette of India: Extraordinary, Feb. 25, 2019. [Online]. Available: https://www.meity.gov.in/static/uploads/2024/02/23rpr.pdf.

International collaborations on design capabilities, supply chain expansion, and manufacturing have been prompted under the scheme.

- Bilateral engagements with various international partners on core components such as semiconductors and chipsets are in the pipeline, with scope for more such engagements as India looks to develop its domestic market

- In terms of trade, free trade agreements with global players are a promising avenue for gaining market access.

India's active engagement through global workshops and exhibitions on electronic components, such as SEMICON India, has also yielded benefits by inviting global stakeholders and manufacturing units to engage with and invest in the sector.

VI. Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Act (SHANTI Act)

Point of Contact
Secretary, Department of Atomic Energy and Chairman, Atomic Energy Commission, Government of India.

chairman@dae.gov.in

The (SHANTI) Act, 2025, is a recent legislative reform in India's nuclear sector. It provides a legal framework for the peaceful use of nuclear energy and radiation technologies, with the objective of supporting the expansion of nuclear power and related applications in a safe, regulated, and future-ready manner.[255]

The Act is intended to enable India to harness the potential of nuclear energy using indigenous resources, with participation from both the public and private sectors in permitted areas. At the same time, it retains government control over sensitive parts of the nuclear fuel cycle and strategic activities.

Objectives

The objectives of the policy primarily focus on introducing reforms to ensure the safe yet rapid expansion of nuclear capacity.

- Zero customs duty until 2035 on the import of goods required for nuclear power projects will make it more viable and result in reduced tariffs for the consumers. It will also enable wider private participation.
- Promote private sector involvement in plan operations; equipment manufacturing; and selected activities, such as the fabrication of nuclear fuel, including conversion, refining, and enrichment of uranium-235 up to such threshold value, or the production, use, processing, or disposal of other prescribed substances.
- Enhance safety and regulations by introducing a graded liability structure, a new civil liability framework, and the establishment of a dispute redressal mechanism and a nuclear damage claims commission.
- Increase production and expand the scope of application in a regulated manner across multiple sectors, including healthcare, industry, agriculture, environment, and research.

[255] Sansad, "The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Bill, 2025." [Online]. Available: https://sansad.in/getFile/BillsTexts/LSBillTexts/Asintroduced/Nuclear%20As%20Introduced1215202532245PM.pdf?source=legislation. [Accessed: Mar. 16, 2026].

International Outlook

The SHANTI framework aligns with India's broader approach of expanding nuclear energy through peaceful international cooperation while retaining domestic strategic oversight. The SHANTI framework is a structured approach to enhancing safety and security in nuclear energy initiatives. India remains committed to full international civil nuclear cooperation and continues to engage with global partners to expand its nuclear energy programme.

Additional Missions related to STI

National Smart Grid Mission (NSGM)
https://www.nsgm.gov.in/

National Supercomputing Mission
https://nsmindia.in/

National BioPharma Mission
https://birac.nic.in/nbm/uploads/2019/07/nationalbiopharmamissiondocument.pdf

Mission on Advanced and High-Impact Research
https://cpri.res.in/en/content/mahir

National Language Translation Mission (NLTM) / BHASHINI
https://www.bhashini.gov.in/

Ayushman Bharat Digital Mission (ABDM)
https://www.abdm.gov.in/

National Mission On Strategic Knowledge For Climate Change
https://moef.gov.in/uploads/2018/04/NAP_E.pdf

Genome India Project
https://genomeindia.in/

Additional Policies related to STI

National Intellectual Property Rights (IPR) Policy,2016
https://www.dpiit.gov.in/ministry/about-us/details/Title=National-Intellectual-Property-Rights-(IPR)-Policy-ITMwETMtQWa

National innovation and startup Policy for students and faculty, 2019
https://mic.gov.in/assets/doc/startup_policy_2019.pdf

National Deep Tech Startup Policy Framework (Draft), 2023
https://www.psa.gov.in/deep-tech-policy

National Policy for promoting innovation in schools, 2022
https://sia.mic.gov.in/assets/doc/school-innovation-policy.pdf

National Logistics Policy, 2022
https://www.dpiit.gov.in/logistics/national-logistics-policy

Digital Personal Data Protection Act, 2023
https://www.meity.gov.in/static/uploads/2024/06/2bf1f0e9f04e6fb4f8fef35e82c42aa5.pdf

Abbreviations

ACC
Advanced Chemistry Cell

AI
Artificial Intelligence

AI-CoE
Artificial Intelligence Centre of Excellence

AIKosh
IndiaAI Datasets Platform

AISI
AI Safety Institute

ANRF
Anusandhan National Research Foundation

ARCI
Advanced Research Centre for Powder Metallurgy and New Materials

ATMP
Assembly, Testing, Marking, and Packaging

AWS
Automatic Weather Stations

BAS
Bharatiya Antariksh Station

BEE
Bureau of Energy Efficiency

BioE3
Biotechnology for Economy, Environment and Employment

BIS
Bureau of Indian Standards

BSL
Biosafety Level

C-DAC
Centre for Development of Advanced Computing

C-DoT
Centre for Development of Telematics

CCAS / OCCAS
Ocean Climate Change Advisory Services

CCEA
Cabinet Committee on Economic Affairs

CCUS
Carbon Capture, Utilisation, and Storage

CDSCO
Central Drugs Standard Control Organisation

CeRAI
Centre for Responsible AI

CIL
Coal India Limited

CMLRE
Centre for Marine Living Resources and Ecology

CPS
Cyber-Physical Systems

CPCB
Central Pollution Control Board

CSIR
Council of Scientific and Industrial Research

CSAR
Chief Science Advisers' Roundtable

CWC
Central Water Commission

DAE
Department of Atomic Energy

DBT
Department of Biotechnology

DGRE
Defence Geoinformatics Research Establishment

DHR
Department of Health Research

DIC
Digital India Corporation

DLI
Design Linked Incentive

DPIIT
Department for Promotion of Industry and Internal Trade

DST
Department of Science and Technology

DWR
Doppler Weather Radars

ESDM
Electronics System Design and Manufacturing

EU
European Union

FAO
Food and Agriculture Organisation

FFT
Frontier and Futuristic Technologies

FY
Financial Year

GHCI
Green Hydrogen Certification Scheme of India

GIAN
Global Initiative of Academic Networks

GPAI
Global Partnership on Artificial Intelligence

GREAT
Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles

GSI
Geological Survey of India

HVIC
Hydrogen Valley Innovation Clusters

IBD
Independent Business Division

ICAR
Indian Council of Agricultural Research

ICGEB
International Centre for Genetic Engineering and Biotechnology

ICMR
Indian Council of Medical Research

IGDI
Integrated Geospatial Data Sharing Interface

IGIF
Integrated Geospatial Information Framework

IIT
Indian Institute of Technology

IISc
Indian Institute of Science

IISER
Indian Institute of Science Education and Research

IMD
India Meteorological Department

IN-SPACe
Indian National Space Promotion and Authorisation Centre

INCOIS
Indian National Centre for Ocean Information Services

IoE
Internet of Everything

IoT
Internet of Things

IP
Intellectual Property

IPR
Intellectual Property Rights

IRDL
Infectious Disease Research and Diagnostic Laboratories

ISM
India Semiconductor Mission

ISRO
Indian Space Research Organisation

ITES-Quantum
International Technology Engagement Strategy for Quantum

KABIL
Khanij Bidesh India Ltd

LLMs
Large Language Models

MAHA-EV
Mission for Advancement in High Impact Areas - Electric Vehicle

MATEXIL
Manmade and Technical Textiles Export Promotion Council

MCC
Mission Coordination Cell

MeitY
Ministry of Electronics and Information Technology

MEMS
Micro-Electro-Mechanical Systems

MNRE
Ministry of New and Renewable Energy

MoE
Ministry of Education

MoES
Ministry of Earth Sciences

MSME
Micro, Small and Medium Enterprises

NCMRWF
National Centre for Medium-Range Weather Forecasting

NCDC
National Centre for Disease Control

NCMM
National Critical Minerals Mission

NCPOR
National Centre for Polar and Ocean Research

NEMMP
National Electric Mobility Mission Plan

NEP
National Education Policy

NGEs
Non-Government Entities

NGHM
National Green Hydrogen Mission

NIOT
National Institute of Ocean Technology

NIPER
National Institute of Pharmaceutical Education and Research

NLP
Natural Language Processing

NM-ICPS
National Mission on Interdisciplinary Cyber-Physical Systems

NMET
National Mineral Exploration Trust

NPEAs
Notified Private Exploration Agencies

NSIL
NewSpace India Limited

NQM
National Quantum Mission

NTTM
National Technical Textiles Mission

OPSA
Office of the Principal Scientific Adviser to Government of India

OSAT
Outsourced Semiconductor Assembly and Test

OTEC
Ocean Thermal Energy Conversion

PEMD
Power Electronics, Machines and Drives

PLI
Production Linked Incentive

PM-ABHIM
Prime Minister's Ayushman Bharat Health Infrastructure Mission

PM-STIAC
Prime Minister's Science, Technology, and Innovation Advisory Council

PMA
Project Management Agency

PSMC
Powerchip Semiconductor Manufacturing Corporation

PSUs
Public Sector Undertakings

QEE
Quantum Entanglement Exchange Programme

QIC / QC Innovation
Quantum Computing Innovation Centre

R&D
Research and Development

SASMIRA
The Synthetic & Art Silk Mills' Research Association

SECI
Solar Energy Corporation of India

SHAKTI
Strategy for Healthcare Advancement through Knowledge, Technology & Innovation

SHANTI Act
Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Act

SHIP
Strategic Hydrogen Innovation Partnership

SIGHT
Strategic Interventions for Green Hydrogen Transition

SITRA
South India Textiles Research Association

SPARC
Scheme for Promotion of Academic and Research Collaboration

STI
Science, Technology, and Innovation

TIH
Technology Innovation Hub

TRL
Technology Readiness Level

TTRP
Technology Translation Research Parks

UGC
University Grants Commission

UN-GGIM
United Nations Committee of Experts on Global Geospatial Information Management

UNEP
United Nations Environment Programme

UNESCO
United Nations Educational, Scientific and Cultural Organisation

VRDL
Virus Research and Diagnostic Laboratories

WHO
World Health Organisation

WOAH
World Organisation for Animal Health

Figures

Fig 1: Major activities of NM-ICPS

Fig 2: Objectives of Deep Ocean Mission

Fig 3: Inter-ministerial Stakeholders of National One Health Mission

Tables

Table 1
Centre of Excellence in AI

Table 2
Host institution and the Quantum technology vertical

Table 3
Technical Groups under Quantum Computing T-Hub

Table 4
Technical Groups under Quantum Communication T-Hub

Table 5
Technical groups - Qmet Tech Foundation

Table 6
Technical groups - Qmdhub

Table 7
List of 25 hubs and their point of contact details (NM-ICPS)

Table 8
Different Organisations under Deep Ocean Mission

Table 9
List of Institutions (E-Node - MAHA EV Mission)

Table 10
List of organisations involved in Mission Mausam with area of focus

Table 11
Distribution of approved financial outlay across components (National Critical Minerals Mission)

India STI Outlook 2026

Chapter V

Internationalisation

From the scientific policy resolution of 1958, which highlighted the importance of science and technology for India's prosperity, to today's mission-mode approach, India's STI ecosystem has evolved from building foundational capacity to actively shaping the global scientific agenda. India's engagement with the global community in S&T is informed by a strategic framework for international S&T collaboration, positioning India as a shaper of the global scientific agenda. In the Global Innovation Index (GII), India was placed at the 38th position globally, out of 139 economies and at the 1st position among Central and Southern Asia partners, with its innovation output at the 25th position. India's leading positions in global rankings highlight

the tremendous rate of growth of its knowledge economy. India's growing trajectory is also exemplified by its cities that serve as innovation hubs like Bengaluru, Delhi and Mumbai, which are among the top 50 most innovation-intensive clusters in the world.

This chapter highlights this trajectory by elucidating how India's S&T ecosystem is engaging with the world – through co-authored research, innovation capital, investments, global capability centres and technology trade, alongside the government-to-government partnerships that frame this engagement.

Outline

5.1 India as a Partner of Scale & Innovation **240**

5.2 India's S&T Partnerships **241**

5.3 Ongoing International S&T Collaborations 243

I. International Joint Publications 243

II. International Joint Innovation 245

III. International Investment Outlook 246

IV. International Firms in India 249

V. Technology Trade 250

5.4 Internationalisation Priorities **252**

Abbreviations *255*

Figures *257*

Tables *257*

5.1 India as a Partner of Scale & Innovation

India's approach to collaboration is rooted in principles of equity and trust, focusing on partnerships that are collaborative in their orientation. Through international collaboration, India aims to augment rather than substitute its domestic S&T priorities. This is highlighted by the scale and depth of India's STI ecosystem, which makes it the partner of choice for international collaboration.

- India is now the third-largest research ecosystem globally, with more than 3 lakh research publications in 2025 alone - an output that has doubled over the previous decade (2016-2025). Of India's total publication output, 24.33% involved international co-authorship, reflecting an already active global research footprint.

- India has a substantial STEM talent base. In 2021, STEM programmes accounted for 30.69% of India's tertiary graduates. According to AISHE 2023–24, around 1.01 crore students, about 22.5% of total higher-education enrolment, were enrolled in STEM programmes.[256].

- Patent applications exceeded 1 lakh in 2024, with grants growing at a CAGR of over 30% across the decade. Resident filings have risen from 30% to nearly 60% of total applications, reflecting the maturing domestic IP base. India is simultaneously a growing market for foreign patent protection and a rising source of internationally filed patents.

- Over 2 lakh recognised startups are active nationally, placing India as the third-largest startup ecosystem in the world with 125 unicorns and over 10,000 deep technology ventures. This base is now drawing global firms to establish their presence in India.

- Foreign direct investment in R&D has risen from 0.09% of total FDI inflows in 2020 to 2% in 2023. The nearly 22-fold proportional increase signals the growing international confidence in India's research and technology ecosystem." with "R&D's share of total FDI equity inflows rose from 0.09% in 2020 to a peak of 2% in 2023, and stood at 0.26% in 2025, still nearly three times the 2020 level. This signals sustained international interest in India's research and technology ecosystem.

[256] UNESCO Institute for Statistics, "Percentage of Graduates from Tertiary Education Programmes in STEM Programmes (Both Sexes)," World Bank Data360, 2026. [Online]. Available: https://data360.worldbank.org/en/indicator/UNESCO_UIS_GRAD_STEM. [Accessed: Feb. 11, 2026].

5.2 India's S&T Partnerships

India maintains S&T partnerships with several partner countries across a range of frontier technology domains. The Department of Science and Technology maintains science and technology cooperation agreements with 83 countries [257]. India also engages through regional and plurilateral platforms – with the EU, ASEAN, BRICS, IBSA, SAARC, BIMSTEC, ASEM and the East Asia Summit – and through international bodies including the NAM S&T Centre, UNCSTD, OECD, UNESCO-TWAS-ICTP, IOR-ARC and the G20 [258].

Elevated Strategic Partnerships

India is also partnering with its strategic partners on a range of frontier & critical technologies:

- **The United States** – TRUST (built on the earlier iCET initiative) is advancing collaboration across semiconductors, artificial intelligence, quantum technologies, critical minerals, biotechnology, energy and space [259].
- **The United Kingdom** – the Technology Security Initiative (TSI) focuses on telecommunications, healthcare, AI and quantum technologies [260]
- **European Union** – the Trade and Technology Council (TTC) serves as a platform for collaboration across strategic technologies, green and clean energy, and trade [261].
- **Australia** – the Partnership on Cyber, Critical Technologies and Supply Chains (PACTS), spanning five pillars: supply-chain resilience, critical technology, cybersecurity, digital public infrastructure, and defence research [262].

These partnership frameworks are further validated by researchers' level publications – joint publications with the US are concentrated in health and digital technologies, while collaboration with the UK spans fundamental physics and telecommunications-adjacent research – directly mirroring the scope of TRUST and TSI.

[257] Department of Science & Technology, "International S&T Cooperation," Department of Science & Technology, Government of India, Jul. 28, 2025. [Online]. Available: https://dst.gov.in/international-st-cooperation. [Accessed: Sep. 1, 2026].

[258] Department of Science & Technology, "International S&T Cooperation," Department of Science & Technology, Government of India, Jul. 28, 2025. [Online]. Available: https://dst.gov.in/international-st-cooperation. [Accessed: Sep. 1, 2026].

[259] Office of the Principal Scientific Adviser to the Government of India, "US - India TRUST Initiative (formerly iCET)," Principal Scientific Adviser, 2026. [Online]. Available: https://www.psa.gov.in/trust. [Accessed: Sep. 1, 2026].

[260] UK Government (Foreign, Commonwealth & Development Office; Department for Science, Innovation & Technology; Prime Minister's Office; Department for Energy Security & Net Zero), "UK-India Technology Security Initiative factsheet," GOV.UK, Jul. 25, 2024. [Online]. Available: https://www.gov.uk/government/publications/uk-india-technology-security-initiative-factsheet/uk-india-technology-security-initiative-factsheet. [Accessed: Sep. 1, 2026].

[261] Ministry of External Affairs, "Joint statement on the third meeting of the India-EU Trade and Technology Council," Government of India, New Delhi, India, Jul. 15, 2026. [Online]. Available: https://www.mea.gov.in/bilateral-documents?dtl/41465. [Accessed: Sep. 1, 2026].

[262] Prime Minister's Office, "Australia-India Partnership on Cyber, Critical Technologies and Supply Chains (PACTS)," Press Information Bureau, Government of India, Jul. 9, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2282692&reg=3&lang=1. [Accessed: Sep. 1, 2026].

Multilateral and Plurilateral Engagement

At the multilateral level, India is an active participant in major international research initiatives, including CERN, ITER, and the Square Kilometre Array Observatory [263] and Facility for Antiproton and Ion Research (FAIR) in Germany, of which India is a founder member [264]. In the domain of technology governance, India has been a notable participant in ITU, ISO and IETF processes. As an active player in AI, India is also anchoring AI governance forums, including the Global Partnership on Artificial Intelligence (GPAI) and the recently held AI Impact Summit 2026, to advocate for inclusive standards that reflect the interests of emerging economies like India [265].

[263] Department of Atomic Energy, "India celebrates joining the SKA Observatory as a Member Country," Government of India. [Online]. Available: https://dae.gov.in/india-celebrates-joining-the-ska-observatory-as-a-member-country/. [Accessed: Oct. 3, 2026].

[264] FAIR GmbH, "About FAIR," Facility for Antiproton and Ion Research, Darmstadt, Germany. [Online]. Available: https://fair-center.eu/about. [Accessed: Oct. 3, 2026]

[265] IndiaAI, Ministry of Electronics and Information Technology, "India AI Impact Summit 2026," IndiaAI, Government of India, 2026. [Online]. Available: https://impact.indiaai.gov.in/. [Accessed: Sep. 1, 2026].

5.3 Ongoing International S&T Collaborations

Beyond named partnerships, India's international engagement shows up directly in the data – in who India's researchers publish with, who files patents through India and where Indian innovators file abroad, where foreign R&D capital is flowing into India and where Indian capital is flowing out, the scale and shape of global capability centres, the international startups now choosing an India presence, and the technology content of India's trade. This section brings that evidence together.

I. International Joint Publications

Research publications indicate that Indian researchers are collaborating most with researchers from the United States. Between 2016 and 2025, Indian and US researchers co-authored 158,076 research publications, out of which around 20% figured in top journals.

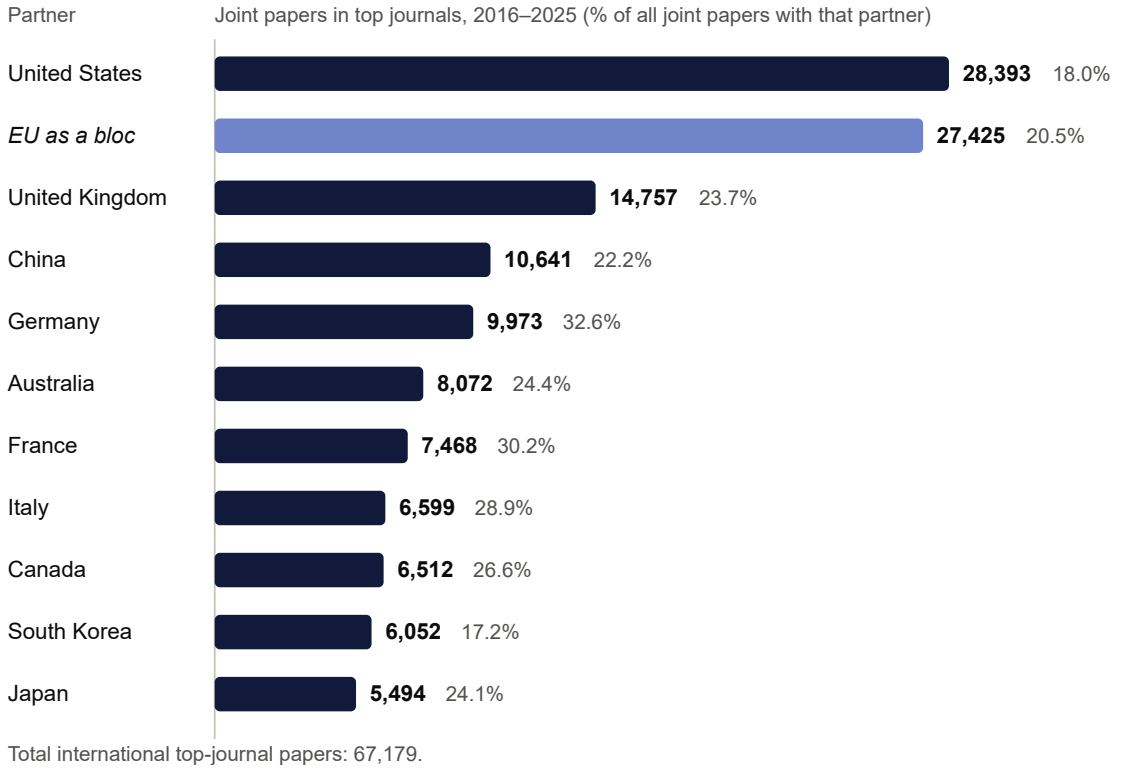


Fig 1: India's research publications - Top 10 partner countries by joint publications in top journals (2016-2025)
Source: OpenAlex; journal lists from Nature Index (June 2026), SCImago Journal Rank (2025) and a discipline-flagship list (see here; for methodology, refer to Chapter 3, section 7). *Date accessed: 25/09/2026*

The United Kingdom (14,757 joint papers in top journals), China (10,641), Germany (9,973) and Australia (8,072) are also among the leading research collaborators. This is followed by France, Italy, Canada, South Korea and Japan. Taken together, the 27 EU member states form India's second-largest research partnership, after the United States. In terms of their share in top journals, 33% of India-Germany and 30% of India-France joint papers appear in top journals.

Partner country	Joint papers (all journals)	Joint papers in top journals	% of joint papers in top journals	Share of India's international co-publications
United States	158,076	28,393	18.0%	29.5%
United Kingdom	62,200	14,757	23.7%	11.6%
China	47,933	10,641	22.2%	8.9%
Germany	30,562	9,973	32.6%	5.7%
Australia	33,046	8,072	24.4%	6.2%
France	24,705	7,468	30.2%	4.6%
Italy	22,873	6,599	28.9%	4.3%
Canada	24,513	6,512	26.6%	4.6%
South Korea	35,097	6,052	17.2%	6.5%
Japan	22,761	5,494	24.1%	4.2%
EU27 (as a bloc)	133,713	27,425	20.5%	24.9%

Table 1: India's research publications - top 10 partner countries: scale and quality of joint publications (2016-2025)
Source: OpenAlex; journal lists from Nature Index (June 2026), SCImago Journal Rank (2025) and a discipline-flagship list. Top journals are defined in the Knowledge Capacity section (Chapter 3). Date accessed: 25/09/2026

Note: Countries are ranked by joint papers in top journals. 'Share of India's international co-publications' is each country's joint papers as a percentage of all internationally co-authored papers India published in 2016-2025, across all journals.

In terms of focus areas, two areas are common across all five leading collaborations in top journals: physics and astronomy (galaxy formation, gravitational waves and particle physics); and clinical and public health research.

- **United States**: In top journals, the leading topics are tuberculosis, maternal and child health, cancer immunotherapy, and diabetes; galaxies, gravitational waves, and particle physics; perovskite and battery materials, semiconductor devices, and neuromorphic computing; and CRISPR, RNA biology, and single-cell genomics. The semiconductor and biology strands align with the semiconductor and biotechnology

priorities of the India-US TRUST initiative [266]. Across all joint papers, the largest topics are particle and high-energy physics, tuberculosis, gravitational waves and child nutrition.

- **United Kingdom**: In top journals, the leading topics are tuberculosis, maternal and child health, diabetes and kidney disease; galaxies, particle physics, gravitational waves and solar and space plasma physics; perovskites and wireless communications; and air quality, climate and health. The focus on telecommunications and advanced materials is also aligned with the UK-India Technology Security Initiative [267]. Across all joint papers, the largest topics are particle and high-energy physics, galaxies, gravitational waves and tuberculosis.

- **China**: In top journals, the leading topics are particle physics and high-energy collisions, galaxies and star formation; lung and liver cancer; perovskites and power and cooling systems; and microplastics, pollutant removal and air quality. Across all joint papers, the largest topics are particle and high-energy physics, photocatalysis, nanofluid heat transfer and nanomaterials.

- **Germany**: The collaboration with Germany focuses most on physics and related areas. In top journals, the leading topics are particle physics, galaxies, gravitational waves and high-energy collisions, alongside perovskites, high-entropy alloys and climate modelling. Across all joint papers, the largest topics are particle physics, high-energy collisions, gravitational waves and galaxies.

- **Australia**: In top journals, the leading topics are kidney and liver disease, tuberculosis and hypertension; galaxies, gravitational waves and particle physics; battery and concrete materials; and microplastics and arsenic contamination. Across all joint papers, the largest topics are gravitational waves, galaxies, particle physics and geochemistry.

II. International Joint Innovation

India's patent system shows an increasing international footprint: a growing market for foreign applicants seeking protection in India, and an expanding base of Indian innovators seeking protection abroad.

[266] Office of the Principal Scientific Adviser to the Government of India, "US - India TRUST Initiative (formerly iCET)," Principal Scientific Adviser, 2026. [Online]. Available: https://www.psa.gov.in/trust. [Accessed: Sep. 1, 2026].

[267] UK Government (Foreign, Commonwealth & Development Office; Department for Science, Innovation & Technology; Prime Minister's Office; Department for Energy Security & Net Zero), "UK-India Technology Security Initiative factsheet," GOV.UK, Jul. 25, 2024. [Online]. Available: https://www.gov.uk/government/publications/uk-india-technology-security-initiative-factsheet/uk-india-technology-security-initiative-factsheet. [Accessed: Sep. 1, 2026].

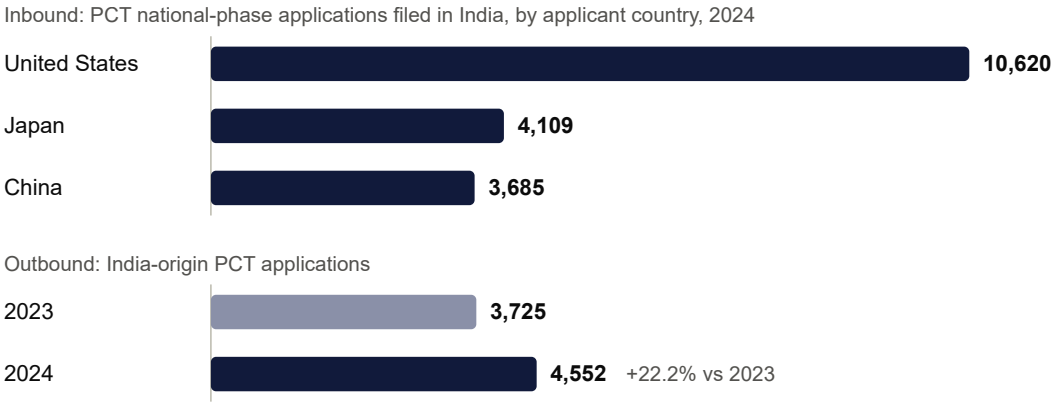


Fig 2: India's Two-Way International Patent Activity
Source: IP India Annual Report 2024-25; WIPO PCT Yearly Review 2025. *Date accessed: 31/08/2026*

The United States is the largest filer of patents through the PCT national phase route in India, with over 10,620 patent applications in 2024, reflecting the scale of the Indian market for American innovators. Japan follows with 4,109 applications and China with 3,685, together highlighting India's standing as a globally important market for patent protection[268].

India-origin applicants filed 4,552 PCT applications through WIPO's electronic filing service (ePCT) in 2024, up 22.4% from 2023, signalling a rising interest for international IP protection [269].

III. International Investment Outlook

Between 2020 and 2025, foreign direct investment (FDI) equity inflows directed towards Research & Development (R&D)[270] in India have shown notable growth and fluctuations, with an overall strengthening of their share of total FDI inflows. According to DPIIT data, R&D-related FDI inflows in 2020 amounted to ₹413.89 crore (US$55.77 million), representing 0.09% of total FDI equity inflows. Over the years, the share of R&D in total FDI rose steadily: in 2021, R&D inflows were around ₹2,555.82 crore (US$343.64 million), approximately 0.84% of overall FDI equity; in 2022, the share was about 0.42%; and in 2023, it reached ₹5,146.33 crore (US$621.69 million), equivalent to 2% of total inflows.

[268] Government of India, "The Semiconductor Integrated Circuits Layout-Design Act, 2000," Act No. 37 of 2000, Intellectual Property India, Ministry of Commerce and Industry, Sep. 2000. [Online]. Available: https://ipindia.gov.in/storage/uploads/docs-operator/7a8f0ca4-5a8e-416e-b8d4-5647ec352bb9.pdf. [Accessed: Sep. 1, 2026].

[269] World Intellectual Property Organization (WIPO), "PCT Yearly Review 2025 – Executive Summary: The International Patent System," WIPO, Geneva, Switzerland, 2025. [Online]. Available: https://www.wipo.int/web-publications/pct-yearly-review-executive-summary-2025/en/pct-yearly-review-2025-executive-summary.html. [Accessed: Sep. 1, 2026].

[270] R&D FDI refers to FDI equity inflows classified by DPIIT specifically under the "Research & Development (R&D)" sub-sector of the Services Sector; it does not include FDI in other sectors that may undertake R&D activities.

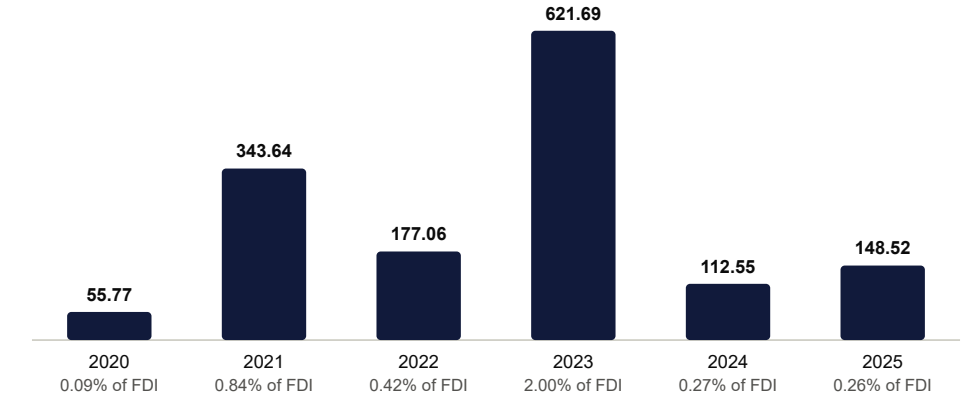


Fig 3: FDI Equity Inflow in R&D in India (2020-25)
Source: DPIIT, Ministry of Commerce & Industry. *Date accessed: 17/08/2026*

Although inflows moderated thereafter to ₹943.12 crore (US$112.55 million) in 2024 (0.27% of total FDI equity inflows) and to around ₹1,286.20 crore (US$148.52 million) (around 0.26%), the R&D share in 2024-2025 remains two to three times higher than in 2020, indicating a sustained orientation towards innovation-linked investment relative to the pre-2021 period. This can be complemented by R&D expenditure data for multinational enterprises operating in India: 390 multinational R&D units recorded a combined R&D expenditure of ₹85,957.04 crore in 2023-24, up from ₹58,914.30 crore in 2021-22[271].

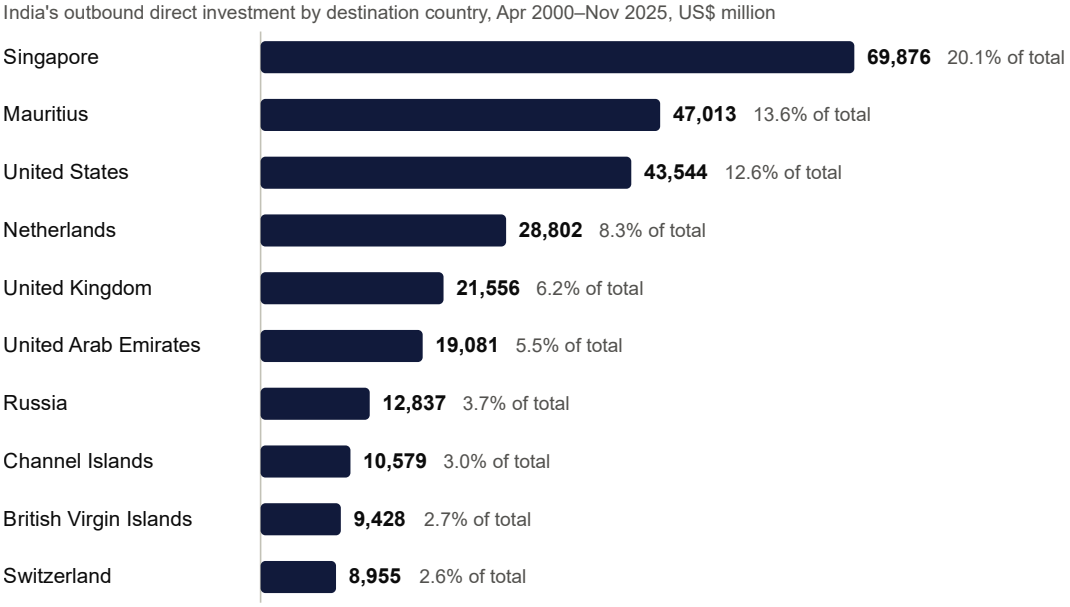


Fig 4: India's Outbound Direct Investment (ODI) by Destination Country (April 2000–November 2025
Source: Department of Economic Affairs, Ministry of Finance. ODI Factsheet, November 2025 (Table F: country-wise actual ODI outflows, including equity, loans and invoked guarantees). *Date accessed: 02/09/2026*

[271] National Science and Technology Management Information System (NSTMIS), S&T Indicators Tables: Research and Development Statistics 2025–26, Table 17, p. 23. New Delhi, India: Department of Science and Technology, Government of India, Jul. 2026. [Online]. Available: https://dst.gov.in/sites/default/files/ST%20INDICATORS%20TABLES%202025-26.pdf [Accessed: Sep. 1, 2026]

As for the Overseas Direct Investment (ODI), Indian companies' ODI outflows totalled US$23,742 million in FY2024-25, with a further US$17,961 million in the first eight months of FY2025-26 (April-November 2025) [272]. Between April 2000 and November 2025, Singapore has been the leading destination for Indian ODI - accounting for 20% (US$69,876 million) of India's total ODI outflows over this period, followed by Mauritius (14%), the United States (13%), the Netherlands (8%), the United Kingdom (6%) and the UAE (5%).

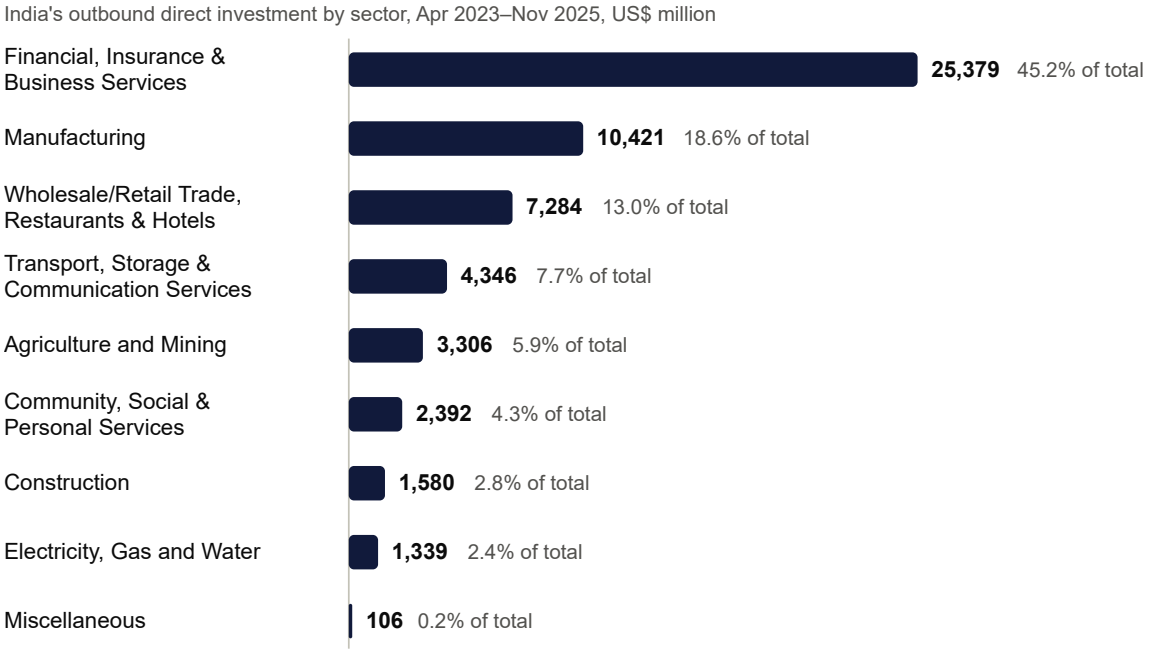


Fig 5: India's Outbound Direct Investment (ODI) by Sector
Source: Department of Economic Affairs, Ministry of Finance. ODI Factsheet, November 2025 (cumulative outflows, April 2023-November 2025). *Date accessed: 02/09/2026*

By sector, Financial, Insurance and Business Services account for the largest share of outbound investment (45% of cumulative outflows over April 2023-November 2025), followed by Manufacturing (19%) and Wholesale/Retail Trade, Restaurants and Hotels (13%). A growing share of this outbound investment is technology-linked. Infosys is expanding its international footprint through acquisitions, including US-based Optimum Healthcare IT [273]. Indian technology and services firms are expanding outbound investments in frontier digital infrastructure and capabilities.

[272] Department of Economic Affairs, "ODI Factsheet November 2025," Ministry of Finance, Government of India, New Delhi, India, Nov. 2025. [Online]. Available: https://dea.gov.in/files/overseas_direct_investment_documents/ODI%20Factsheet%20November%202025.pdf. [Accessed: Sep. 2, 2026].

[273] Infosys Limited, "Infosys Completes Acquisition of Leading Healthcare Digital Transformation Company, Optimum Healthcare IT," Infosys Newsroom, May 5, 2026. [Online]. Available: https://www.infosys.com/newsroom/press-releases/2026/completes-acquisition-optimum-healthcare-it.html. [Accessed: Sep. 2, 2026].

IV. International Firms in India

A substantial share of multinational R&D work in India is operationalised through Global Capability Centres (GCCs), which have scaled into a major national platform for product engineering, analytics, cyber-security and AI-enabled functions. Over 1,700 GCCs are active in India, employing around 19 lakh (1.9 million) professionals [274]. In FY2024, GCCs recorded a combined revenue of $64.6 billion, growing at a rate of around 9.8% annually. Over the last five years, the setup rate of Engineering, Research and Development (ER&D) GCCs has grown 1.3 times faster than the overall GCC setup rate, indicating a shift toward higher-value engineering and product development in cutting-edge solutions, AI/ML capabilities, and digital services.

1,700	1.9M	$64.6B	9.8%	1.3×
GCCs active in India 2025	GCC employees 2025	Combined revenue FY2024	Revenue growth recent years	ER&D GCC setup rate vs all GCCs, 5 years

Fig 6a: GCCs by headquarters region, share of total

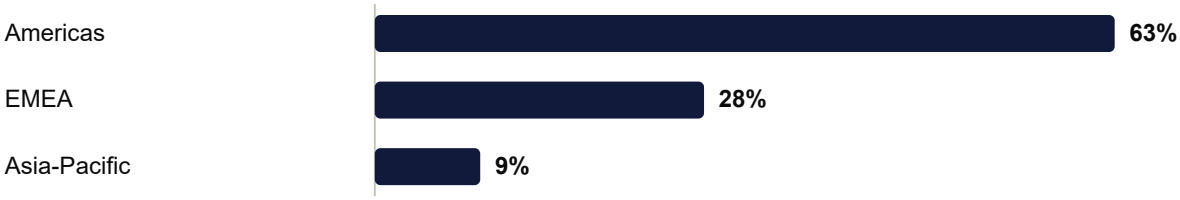


Fig 6b: GCCs by sector, share of total

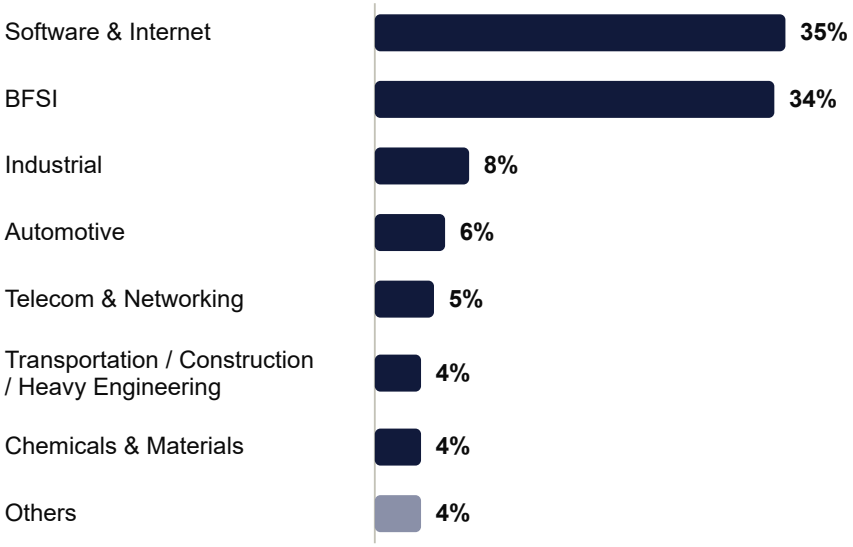


Fig 6: Global Capability Centres (GCCs) — Origin and Focus
Source: Nasscom-Zinnov, India GCC Landscape Report 2026 (FY26E). *Date accessed: 31/08/2026*

[274] Press Information Bureau, "From Policy to Prosperity: GCCs Leading India's Growth Journey," Press Information Bureau, Government of India, Dec. 11, 2025. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2202046&lang=1&reg=3. [Accessed: Sep. 2, 2026].

By headquarters region, companies from the Americas account for the large majority of India's GCCs at 63% of the total existing base (FY26E). EMEA-origin centres (Europe, the Middle East and Africa) make up 28% of the base, and Asia-Pacific origins a further 9% [275]. By sector, software and internet companies (35%) and BFSI (34%) together account for the large majority of India's GCC base, with industrial (8%), automotive (6%), telecom (5%), transportation/construction/heavy engineering (4%) and chemicals (4%) making up the remaining share.

India's scale as a market and a talent base is also drawing foreign-origin startups to set up their presence in India across frontier technology domains. OpenAI opened its first India office in New Delhi in August 2025, its fourth office in Asia after Japan, Singapore and South Korea [276]. Anthropic also opened its first India office in Bengaluru in February 2026, its second Asian location after Tokyo, to work directly with Indian startups and enterprises [277].

V. Technology Trade

India's international S&T engagement is also visible in the technology content of its trade. Over 2021-2025, India's merchandise trade expanded steadily: exports rose from USD 395 billion to USD 447 billion (a CAGR of around 3.1%), while imports increased from USD 570 billion to USD 753 billion (a CAGR of around 7%) [278].

Within this, India's share of global high-technology exports [279] increased steadily from 0.98% in 2021 to 1.53% in 2025. This is supported by high-technology export value rising from USD 58.1 billion to USD 107.4 billion over the same period, with an estimated CAGR of around 16.5%. India's high-technology exports outpaced the world's high-technology exports over the same period (4.3%).

Electronics, drugs and pharmaceuticals, and engineering goods are among the major exported categories. Electrical machinery and equipment exports alone increased from USD 19 billion in 2021 to USD 54 billion in 2025, with pharmaceutical exports rising from USD 19 billion to USD 26 billion and exports for vehicles other than railway or tramway

[275] Zinnov and Nasscom, "India GCC Landscape 2026 Report," Zinnov Management Consulting and National Association of Software and Service Companies, Bengaluru, India, Rep., May 2026. [Online]. Available: https://media.zinnov.com/wp-content/uploads/2026/05/zinnov-nasscom-india-gcc-landscape-2026-report.pdf. [Accessed: Sep. 2, 2026].

[276] R. Agarwal, "ChatGPT parent OpenAI leases first 50-seater office space in New Delhi," Business Standard, Nov. 12, 2025. [Online]. Available: https://www.business-standard.com/companies/news/openai-first-office-delhi-corporatedge-chatgpt-expansion-india-125111200119_1.html. [Accessed: Sep. 2, 2026].

[277] Anthropic, "Anthropic opens Bengaluru office and announces new partnerships across India," Anthropic News, Feb. 16, 2026. [Online]. Available: https://www.anthropic.com/news/bengaluru-office-partnerships-across-india. [Accessed: Sep. 2, 2026].

[278] Data accessed from ITC TradeMap Database (Accessed 13/08/26)

[279] High Technology Exports has been categorised under HS codes 30,85,87 and 88.

rolling-stock from USD 19 billion to USD 25 billion over the same period [280]. The following figure compares the 2021 and 2025 export values of these categories and the growth rate implied for each:

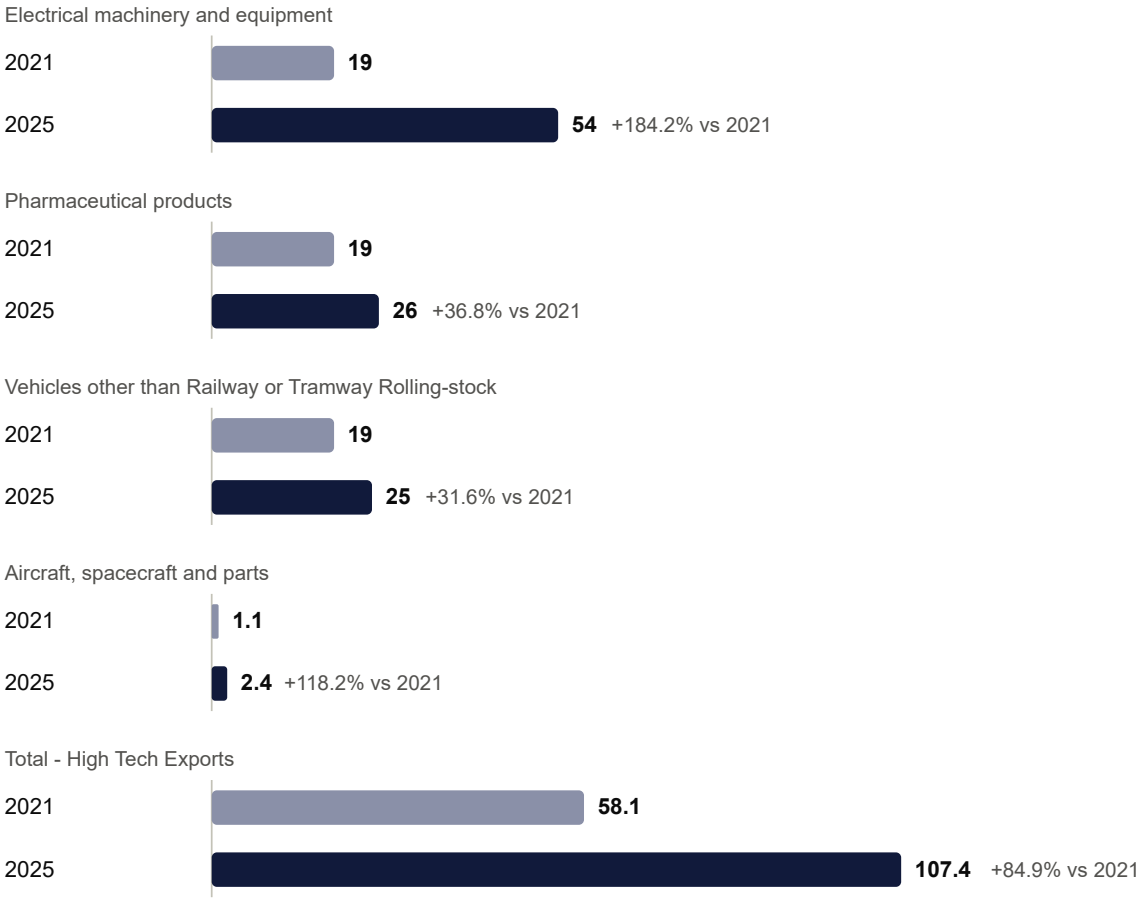


Fig 7: High-Technology Exports and Key Export Categories, 2021 vs 2025
Source: ITC Trade Map database. *Date accessed 13/08/2026*

For a detailed analysis of India's technology trade, including India's import basket and product-level detail, please refer to Chapter 3.

[280] Data accessed from ITC TradeMap Database (Accessed 13/08/26)

5.4 Internationalisation Priorities

Several initiatives have been taken to advance India's priorities and vision in S&T. These initiatives showcase the direction of India's research and innovation priorities and pathways for collaboration with international partners. On the R&D front, the Anusandhan National Research Foundation (ANRF) was launched in 2023 to facilitate a unified, mission-oriented funding architecture in the country. The ANRF, through its funding, is targeting R&D across areas like natural sciences, engineering, health and agriculture. To further push for a thriving research ecosystem in the country, India has launched the Research, Development and Innovation (RDI) Fund in 2025. The RDI fund is India's largest ever investment in research-led innovation and is backed by a total outlay of ₹1 lakh crore over six years, with ₹20,000 crore already been allotted for FY 2025-2026. Through this fund, the government aims to catalyse R&D by the private sector, especially in sunrise sectors like quantum technologies, AI, biotechnology, energy transition, space technologies and the digital economy. These R&D initiatives reflect India's ambition to convert high-potential research in deeptech areas into products and technologies that lead at the global stage. It also highlights the growth in India's expenditure in R&D, which has more than doubled from ₹60,197 crore in 2010-2011 to ₹2,44,767.81 crore in 2023–24.

Apart from having R&D funding measures for the broader STI ecosystem, India is also focusing on priority S&T areas by having a 'mission-mode approach'. By strategically positioned missions, the aim is to achieve specific, time-bound targets through concentrated interventions in various S&T areas. India currently has such missions ongoing for a host of S&T areas – like the National Quantum Mission (₹6,003 crore), the India AI Mission (₹10,372 crore), the India Semiconductor Mission (₹76,000 crore), the National Green Hydrogen Mission (₹19,744 crore), the Deep Ocean Mission (₹4,077 crores) and the National Critical Mineral Mission (₹34,300 crore total outlay, of which ₹16,300 crore is central budgetary support). These missions enable a push for India's technological priorities and also provide entry points for international partners to collaborate across the spectrum. For a mission-by-mission overview of international partnerships and collaboration mechanisms, please refer to Chapter 4.

Across these missions, India's international priorities are reflected. To solidify India's position as a global leader across frontier technologies of semiconductors, critical minerals and green hydrogen is one such priority, while continuing to contribute to shaping global norms and governance mechanisms for frontier technologies, like AI and quantum, is another. The mission-wise international priorities are summarised below.

- **Artificial Intelligence**: India convened the AI Impact Summit in New Delhi in February 2026, whose Declaration was endorsed by more than 90 countries and international organisations, and it anchors its participation in global AI governance through the AI

Safety Institute and the International Network of AI Safety Institutes [281].

- **Quantum Technologies**: The National Quantum Mission's international vision includes secure quantum communications with partner countries [282], and it builds on quantum collaboration under the US-India TRUST initiative, the EU-India TTC and the UK-India TSI (see Section 5.2).

- **Semiconductors**: Priorities span fabrication, advanced packaging, design, equipment, materials and skills, with collaboration underway with the US, Japan, Malaysia, Singapore and the EU and with industry and research bodies such as Micron Technology, Foxconn, IBM and Purdue University (see Chapter 4). The most recent example is the May 2026 MoU between Tata Electronics and ASML to deploy ASML's lithography tools and solutions at the Dholera fab [283]. The India Semiconductor Mission 2.0, approved by the Union Cabinet in July 2026 with an outlay of ₹1,27,500 crore, deepens this agenda towards semiconductor equipment and materials, full-stack Indian design IP, stronger domestic and global supply chains, and R&D and training centres [284].

- **Green Hydrogen**: Bilateral engagements with Australia and Germany are focusing on technologies such as electrolysers and fuel cells, and exploring private investment in sector R&D[285] [286].

- **Critical Minerals**: KABIL has established agreements for mineral block exploration in Argentina, and bilateral engagements with Canada and Australia are focusing on resilient supply chains, investment promotion and knowledge exchange [287] [288]. India has also advocated international collaboration and global investment in R&D through the Mineral Security Partnership and the Future Minerals Forum.

[281] Press Information Bureau, "India AI Impact Summit 2026: Landmark Global Declaration and Major AI Investment Commitments," Government of India, Mar. 2, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2234343&reg=3&lang=1. [Accessed: Sep. 3, 2026]

[282] Department of Science & Technology, "National Quantum Mission (NQM)," Government of India. [Online]. Available: https://dst.gov.in/national-quantum-mission-nqm. [Accessed: Sep. 3, 2026].

[283] Tata Electronics, "Tata Electronics and ASML Announce Strategic Partnership to Advance the Semiconductor Manufacturing Ecosystem in India," Press Release, May 16, 2026. [Online]. Available: https://www.tata.com/newsroom/business/tata-electronics-asml-semiconductor-ecosystem. [Accessed: Oct. 3, 2026].

[284] Press Information Bureau, "India Semiconductor Mission 2.0," Government of India, Jul. 15, 2026. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2284784&reg=48&lang=1. [Accessed: Oct. 3, 2026].

[285] Ministry of New and Renewable Energy, "India-Australia Green Hydrogen Taskforce – Recommendation Report," Government of India. [Online]. Available: https://mnre.gov.in/en/document/india-australia-green-hydrogen-taskforce-recommendation-report/. [Accessed: Oct. 3, 2026]

[286] Press Information Bureau, "Joint declaration of Intent on Indo–German Green Hydrogen Task Force signed," Government of India. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=1822146. [Accessed: Oct. 3, 2026]

[287] Press Information Bureau, "KABIL is exploring opportunities for acquisition of overseas critical minerals assets in Argentina, Australia and Chile," Government of India. [Online]. Available: https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039606&reg=3&lang=2. [Accessed: Oct. 3, 2026]

[288] Press Information Bureau, "India-Canada Joint Leaders' Statement," Government of India. [Online]. Available: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2234572&reg=6&lang=11. [Accessed: Oct. 3, 2026].

India is also well-positioned to bring out perspectives of its neighbours and emerging economies in global technology governance conversations. India brings substantive standing to global technology governance conversations, advocating for the perspectives of the emerging economies. Ranked first globally in ICT services exports, India is a credible voice in multilateral standards-setting bodies [289]. Its expertise in Digital Public Infrastructure (DPI) also positions it as a constructive contributor to global frameworks for equitable digital systems. India's engagement in ITU, ISO, IETF, GPAI and other emerging technology governance mechanisms highlights its commitment to ensuring that norms and standards shaping frontier technologies are inclusive to all.

For international partners, these priorities translate into concrete entry points: co-development and testing of frontier technologies in quantum, AI, semiconductors and green hydrogen; investment and supply-chain partnerships in semiconductors, critical minerals and hydrogen; joint ocean, hydrogen and quantum research supported by academic and researcher exchange; and collaboration on standards, safety and governance in AI and other emerging technologies. India is open to partnerships in terms of mutual benefit, with each mission's international engagement designed to strengthen, rather than replace, domestic capability.

In the 21st century, India's STI ecosystem is well-positioned with scale, direction and ambition. With nearly 25% of India's research publications already internationally co-authored, over 1,700 GCCs anchoring multinational R&D in India, a rising base of India-origin international patent filings, and a growing list of global technology companies choosing an India presence, the foundation for deeper partnerships is well established. Areas of frontier technologies like quantum, AI, semiconductors, next-generation energy systems, advanced biotechnology and space, present the most impactful opportunities for sustained collaboration.

India welcomes engagement with international partners on STI that aim to build mutually beneficial partnerships. Such partnerships, grounded in mutual respect and a commitment to shared benefit, are integral to India's vision of an S&T ecosystem that serves national imperatives while also promoting the broader goals of sustainable development. Concrete pathways for such engagement exist across India's institutional architecture - through joint research programmes under the ANRF, technology-specific collaboration across quantum, AI, space, and clean energy and India's participation in the standards and technology governance processes. These collaboration pathways highlight India's commitment to partnerships that are as durable as they are mutually beneficial.

[289] World Intellectual Property Organization, "Global Innovation Index 2025: India ranking in the Global Innovation Index 2025," WIPO, Geneva, Switzerland, 2025.

Abbreviations

AI
Artificial Intelligence

ANRF
Anusandhan National Research Foundation

ASEAN
Association of Southeast Asian Nations

ASEM
Asia-Europe Meeting

ASML
Advanced Semiconductor Materials Lithography

BFSI
Banking, Financial Services, and Insurance

BIMSTEC
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation

BRICS
Brazil, Russia, India, China, and South Africa

CAGR
Compound Annual Growth Rate

CERN
European Organisation for Nuclear Research

CRISPR
Clustered Regularly Interspaced Short Palindromic Repeats

DPI
Digital Public Infrastructure

DPIIT
Department for Promotion of Industry and Internal Trade

DST
Department of Science and Technology

EMEA
Europe, the Middle East, and Africa

ER&D
Engineering, Research and Development

EU
European Union

EU27
European Union 27 Member States

FAIR
Facility for Antiproton and Ion Research

FDI
Foreign Direct Investment

GCC
Global Capability Centre

GII
Global Innovation Index

GPAI
Global Partnership on Artificial Intelligence

IBSA
India, Brazil, South Africa

iCET / TRUST
Initiative on Critical and Emerging Technology / TRUST initiative

ICT
Information and Communication Technology

ICTP
International Centre for Theoretical Physics

IETF
Internet Engineering Task Force

IOR-ARC
Indian Ocean Rim Association for Regional Cooperation

IP
Intellectual Property

ISO
International Organisation for Standardisation

ITER
International Thermonuclear Experimental Reactor

ITU
International Telecommunication Union

KABIL
Khanij Bidesh India Ltd

ML
Machine Learning

NAM
Non-Aligned Movement

OECD
Organisation for Economic Co-operation and Development

ODI
Outbound Direct Investment

PACTS
Partnership on Cyber, Critical Technologies and Supply Chains

PCT
Patent Cooperation Treaty

R&D
Research and Development

RDI
Research, Development and Innovation

SAARC
South Asian Association for Regional Cooperation

SCImago
SCImago Journal Rank

S&T
Science and Technology

STI
Science, Technology, and Innovation

TSI
Technology Security Initiative

TTC
Trade and Technology Council

UNCSTD
United Nations Commission on Science and Technology for Development

UNESCO
United Nations Educational, Scientific and Cultural Organisation

US / USA
United States of America

WIPO
World Intellectual Property Organisation

Figures

Fig 1
India's research publications - Top 10 partner countries by joint publications in top journals (2016-2025)

Fig 2
India’s Two-Way International Patent Activity

Fig 3
FDI Equity Inflow in R&D in India (2020-25)

Fig 4
India’s Outbound Direct Investment (ODI) by Destination Country (April 2000–November 2025)

Fig 5
India’s Outbound Direct Investment (ODI) by Sector

Fig 6
Global Capability Centres (GCCs) — Origin and Focus

Fig 7
High-Technology Exports and Key Export Categories, 2021 vs 2025

Tables

Table 1
India's research publications - top 10 partner countries: scale and quality of joint publications (2016-2025)

भारत सरकार के प्रधान वैज्ञानिक सलाहकार का कार्यालय
Office of the Principal Scientific Adviser
to the Government of India

www.psa.gov.in