GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION NO. 4458
ANSWERED ON 02/04/2026

RESEARCH AND INNOVATION IN EMERGING AREAS

4458 SHRI RAVI CHANDRA VADDIRAJU:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether Government has launched initiatives to promote research and innovation in emerging areas such as Artificial Intelligence, Quantum Technology and Biotechnology;

(b) the funds allocated for research and development during the last three years;

(c) whether new programmes have been introduced to encourage collaboration between academia, industry and research institutions; and

(d) the measures taken to support start-ups and young scientists in advanced research fields?

ANSWER

MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE
MINISTRY OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) to (b): The Government has launched various initiatives to promote research and innovation in emerging areas such as Artificial Intelligence (AI), Quantum Technology and Biotechnology, the details of which are given below:

1. Ministry of Science and Technology :

i. Department of Science & Technology (DST) is implementing the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), with an outlay of Rs.3,660 crore to promote R&D, innovation, skilled manpower and international collaboration in emerging technologies. Under NM-ICPS, 25 Technology Innovation Hubs (TIHs) have been established across leading academic institutions, including dedicated TIHs working in the areas of AI and Quantum Technologies. Funds allocated to the AI & Quantum TIHs during the last three years is Rs.173.58 crore.

Further, a flagship AI project, “Bharat-Gen: A Suite of Generative AI Technologies for India”, is being implemented at the TIH Foundation for IoT & IoE, IIT Bombay with an outlay of Rs. 235.17 crore for development of generative AI technologies. This project is a multimodal, multilingual Large Language Model initiative, focused on developing efficient and inclusive AI solutions in 22 scheduled Indian languages.

ii. DST is also implementing the National Quantum Mission (NQM) with an outlay of Rs. 6003.65 crore. NQM aims to promote Technology Development, Human Resource Development, Entrepreneurship Development & Industry Collaboration and International Collaborations in various verticals of quantum technology through four (04) Thematic Hubs (T-Hubs). Funds allocated to T-Hubs during the last three years is Rs. 699.54 crore

iii. Council of Scientific & Industrial Research (CSIR) is supporting R&D initiatives in emerging areas such as Artificial Intelligence, Quantum Technology and Biotechnology. Funds allocated to these initiatives during the last three years is Rs. 237.09 crore.

iv. Department of Biotechnology (DBT) has launched the BioE3 Policy to establish critical bio-enablers such as Bio-Artificial Intelligence (AI) Hubs, biofoundries and biomanufacturing hubs, aimed at fostering innovation and facilitating scale-up across key thematic sectors. Programmes in quantum biotechnology have been initiated to strengthen research and innovation in areas including agriculture, healthcare, diagnostics and imaging. DBT is also supporting the Indian Tuberculosis Genome Surveillance Consortium (InTGS) that aims to sequence over 30,000 clinical isolates nationwide, using genomics and AI for rapid detection of drug-resistant strains. Funds allocated to these initiatives (last three years) is Rs.7,541.19 crore.

2. The Ministry of Electronics and Information Technology (MeitY) is implementing the IndiaAI Mission, with an outlay of Rs. 10,371.92 Crore. The Mission is a comprehensive programme for leveraging transformative technologies to foster inclusion, innovation and adoption for social impact, as well as to make India a global leader in the Al space and ensure responsible and transformational use of Al for All.

3. The Ministry of Education (MoE) has established four Centres of Excellence (CoEs) in AI as part of the vision to "Make AI in India and Make AI work for India" in the areas of Education, Healthcare, Sustainable Cities and Agriculture. These AI-CoEs are being led by IIT Madras, IISc Bangalore, IIT Kanpur and IIT Ropar respectively. The total budget outlay for the four AI-CoEs is Rs. 1490 crores. Each AI-CoE is a consortium of leading academic, research institutions along with industry partners and leading start-ups.

(c) The Government has introduced several programmes to encourage collaboration between academia, industry and research institutions. Key initiatives include:

- DST promotes collaboration between academia, industry and research institutions through Missions such as the NM-ICPS and the NQM, which are designed to foster strong linkages among academia, industry, and research institutions through TIHs and T-Hubs respectively. Further, DST has launched the Research, Development and Innovation (RDI) Scheme with a corpus of Rs. 1 lakh crore over a period of six years. The scheme promotes industry-academia partnerships in priority sectors such as deep technologies (including quantum computing, robotics and space technologies), Artificial Intelligence and its applications, and biotechnology, among others.

- The Anusandhan National Research Foundation (ANRF) has launched the Artificial Intelligence for Science & Engineering (AI-SE) initiative under its Mission for Advancement in High-Impact Areas (MAHA), in collaboration with MeitY, DRDO, Ministry of Earth Sciences (MoES), DBT and the Gates Foundation. The initiative aims to integrate AI into scientific research and promote interdisciplinary and inter-institutional collaboration.

- DBT, through the Biotechnology Industry Research Assistance Council (BIRAC), supports multiple programmes to strengthen academia-industry partnerships and facilitate translational research and innovation.

(d) The Government has taken several measures to support start-ups and young scientists in advanced research fields through targeted schemes and institutional mechanisms. DST's Missions such as NM-ICPS and NQM include dedicated components for Entrepreneurship Development and Human Resource Development. In addition, programmes such as National Initiative for Developing and Harnessing Innovations (NIDHI) provide end-to-end support for start-ups including incubation, seed funding, mentorship and technology commercialization. DST's RDI scheme supports private sector enterprises, start-ups and industries in sunrise and strategic sectors by providing patient capital, thus accelerating investment in India's R&D and innovation ecosystem.

ANRF provides targeted support to young scientists through schemes such as Ramanujan Fellowship, National Post-Doctoral Fellowship (NPDF), Prime Minister Early Career Research Grant (PMECRG), Advanced Research Grant (ARG) and Inclusivity Research Grant (IRG).

DBT, through BIRAC, implements multiple programmes to support start-ups and young scientists in biotechnology and allied areas.

CSIR has established incubation centres at a few of its constituent laboratories to promote innovation and support startups and provides doctoral and postdoctoral fellowships under the "Capacity Building and Human Resource Development Scheme".

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