

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION NO. 442
ANSWERED ON 25/07/2024

**STATUS ON DEVELOPMENT AND DEPLOYMENT OF CRITICAL EMERGING
TECHNOLOGIES**

442 SHRI SUJEET KUMAR:

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

- (a) the steps taken by Government to enable India to lead the development and deployment of the critical emerging technologies in light of India's galloping stride in the Global Innovation Index;
- (b) whether Government has formulated a strategic roadmap to propel India into a leadership position in emerging technologies, if so, the details thereof; and
- (c) the details of the funds disbursed and utilized in the financial years 2022-23 and 2023-24 for the development and deployment of the critical emerging technologies in the country?

ANSWER

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

(a) A number of steps have been taken by the Government to enable India to lead the development and deployment of the critical emerging technologies like Cyber-Physical Systems (CPS), Quantum Technologies, Artificial Intelligence (AI) etc. Following are some of the initiatives undertaken by different departments:

1. The Department of Science & Technology (DST) is implementing a National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) at a total cost of Rs 3660 crores for a period of five years, under which 25 Technology Innovation Hubs (TIHs) have been established across the country covering key critical emerging technologies.
2. DST is also implementing a National Quantum Mission (NQM) at a total cost of Rs.6003.65 crore for a period of eight years, aiming to create a vibrant & innovative ecosystem in Quantum Technology (QT) that includes setting up of four Thematic Hubs (T-Hubs) in the domains of Quantum Computing, Quantum Communication, Quantum Sensing & Metrology and Quantum Materials & Devices.

3. The Ministry of Electronics and Information Technology (MeitY) has launched an IndiaAI Mission for leveraging transformative technologies to foster inclusion, innovation and adoption for social impact as well as to make India a global leader in the AI space and ensure responsible and transformational use of “AI for All”. In addition, MeitY has established Centres of Excellence in various emerging technologies including Artificial Intelligence to explore opportunities in these specialized fields. These centres provide start-ups with premium plug-and-play co-working spaces and access to the ecosystem.
4. MeitY has launched a "National AI Portal" (<https://indiaai.gov.in/>) to serve as a comprehensive repository of Artificial Intelligence (AI) initiatives in the country. The portal acts as a single point of reference for individuals, researchers, and industry professionals seeking information about AI initiatives in India, including academic research, start-ups, policy initiatives, and other related information. MeitY has initiated ‘Future Skills PRIME’ a programme for re-skilling/up-skilling of IT manpower for employability in 10 new/emerging technologies. These include AI, Block chain, Robotics, Big Data & Analytics, IoT, Virtual Reality, Cyber security, Cloud Computing, 3D Printing and Web 3.0.
5. The government has also developed enabling policies and programs to ensure effective R&D and technology development & deployment such as the National Education Policy, Anusandhan National Research Foundation, National Data Sharing & Access Policy (NDSAP).The Government has also come up with a draft National Deep Tech Start-up Policy (NDTSP) which aims to build a strong product-based economy by supporting start-ups involved in the development of emerging technologies.
6. Government has published a National Strategy for Artificial Intelligence in June 2018 to enable development of an ecosystem for the research and adoption of Artificial Intelligence.
7. India is a founding member of Global Partnership on Artificial Intelligence (GPAI), having joined the multi-stakeholder initiative on June 15, 2020.
8. Defence Research and Development Organisation (DRDO) under Ministry of Defence (MoD) has initiated Technology Development Fund (TDF) scheme to encourage industries especially MSMEs and Start-ups to design and develop various Defence technologies. It has also initiated Dare to Dream Pan India Innovation contest to support start-ups & innovators to contribute in defence ecosystem. In addition, DRDO has launched long term Directed Research Policy for the engagement of academia, start-ups/ industry for directed research to meet the future technology requirements of defence & national security. Various projects in fields of Emerging Technologies like Additive manufacturing/ 3D Printing, Hydrogen production, Scientific Computing for Naval Applications etc. in the year of 2022-23 and 2023-24 are also being taken up DRDO.

(b) Yes, Sir. The Government has been working on building sectoral roadmaps for various emerging technologies. DST launched Technology Fusion & Applications Research (TFAR) and Quantum Enabled Science & Technology (QuEST) programmes ahead of the launch of National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) and National Quantum Mission (NQM), respectively.

The Office of Principal Scientific Adviser (PSA) to Government of India has developed two reports/roadmaps with respect to emerging technologies in the energy sector. These include a report on “Synchronizing energy transitions towards possible Net-Zero for India: Affordable and clean energy for All” and a “e-mobility R&D Roadmap for India” which outlines the roadmap and projects necessary for India to lead in both the value and supply chains for e-mobility, to reduce the dependence on imports in this sector in next 5 to 7 years.

Furthermore, recognising the need for strategic partnerships with key partner countries to reach global leadership position in some of emerging technologies, specific initiatives have been launched with countries like US, EU and QUAD member countries (Australia, Japan, India and US) etc. These include; an India-US initiative on Critical and Emerging Technologies (iCET); India-EU Trade and Technology Council (TTC), a strategic coordination and engagement on trade and technology between India and Europe and QUAD initiative on Critical and Emerging Technologies (CET).

DRDO has also initiated the creation of technology road map for DRDO Industry Academia Centre of Excellences (DIA-CoEs) in sync with the long term technology needs of DRDO Labs.

(c) The details of the funds disbursed and utilized in the FY 2022-23 and FY 2023-24 for the development and deployment of the critical emerging technologies in the country are as follows:

(Amount in Rs. Cr)					
S. No.	Name of the programme	Funds disbursed in FY 2022-23	Funds utilised in FY 2022-23	Funds disbursed in FY 2023-24	Funds utilised in FY 2023-24
1.	NM-ICPS	300.00	299.40	435.00	435.00
2.	AI & Emerging Tech Division, MeitY (excluding budgetary details of skilling and data initiatives)	65.00	50.78	75.00	70.48

In addition, DRDO has done a total expenditure of Rs. 204.75 Cr in FY 2022-23 and Rs. 264.79 Cr in FY 2023-24 for the development and deployment of the critical emerging technologies in the country.
