

8. Science Allocation in Budget- Science & Technology

Budget gives science missions' big numbers but core funding gaps persist

The Union Budget 2026–27 prioritizes science-led growth through mission-mode projects like semiconductors and biomanufacturing, but faces hurdles due to India's stagnant R&D spending (0.6–0.7% of GDP) and declining actual allocations. Success now hinges on bridging the funding gap by incentivizing private sector participation and ensuring effective delivery of allocated funds.

The Union Budget 2026–27 projects a strong ambition for science-led growth. However, experts warn that success relies on effective delivery, timely funding, institutional autonomy, and transparent financing for innovation.

Funding Trends and Issues

Declining Allocations (Example from 2023–24)– Data shows a trend of downward revision in scientific department allocations–

Department of Biotechnology (DBT)

- 1. Budget Estimate– ₹2,683.86 crore.
- 2. Revised Estimate– Down to ₹1,607.32 crore.
- 3. Actual Spending– Fell further to ₹1,467.34 crore.

Department of Science and Technology (DST)

- 1. Budget Estimate– ₹7,931.05 crore.
- 2. Revised Estimate– Down to ₹4,891.78 crore.
- 3. Actual Spending– ₹4,002.67 crore.

Mission-Mode Push

- 1. The budget supports major missions such as Semiconductor Mission 2.0, CCUS (Carbon Capture, Utilization, and Storage), critical minerals, and biomanufacturing hubs.
- 2. Key Concern– There are apprehensions regarding long-term, stable financing beyond the initial policy announcements.

R&D Expenditure- India vs. Global Standards

Feature	India's Status	Global Comparison
GERD (% of GDP)	0.6% to 0.7%	Significantly lower than the global average and countries like China, South Korea, and the US.
Private Sector Share	~36% (Low)	In advanced nations, private sector contributions exceed 70%.
Government Share	43.7% (High reliance on Central Govt)	Lower reliance on public funds in developed economies.

GERD– Gross Expenditure on Research and Development

Need for Funding in R&D

Economic Growth– It drives the creation of new industries, improves productivity, and enhances global competitiveness.

Technological Advancement– Essential for breakthroughs in critical fields like Artificial Intelligence (AI), biotechnology, and renewable energy.

Social Challenges– Helps address pressing issues such as poverty, healthcare, education, and environmental sustainability.

Job Creation– Innovation generates high-quality employment opportunities and stimulates entrepreneurship.

Global Positioning– Positions India as a global leader in the knowledge economy.

Attracts Investment– robust R&D ecosystems promote both foreign and domestic investments.

Implications of Low Funding

Investment Concerns- There is limited investment in research and development, particularly within public institutions.

Infrastructure Gaps- Many institutions suffer from inadequate research facilities and resources.

Brain Drain- Top talent migrates to other countries due to better research opportunities abroad.

Lack of Industry Collaboration- There are limited partnerships between academia and industry, hindering practical innovation.

Skill Gaps- Insufficient funding leads to inadequate training and development for skilled researchers and innovators.

Government Initiatives

Funding & Strategic Frameworks

Research, Development and Innovation (RDI) Scheme

1. Approved with a ₹1 lakh crore corpus.
2. Aims to energise private-sector R&D and deep-tech startups.
3. Offers long-term, low/zero-interest loans and equity investments.
4. Funds a new Deep-Tech Fund of Funds via the ANRF.

Anusandhan National Research Foundation (ANRF)

1. Established in 2023 to provide high-level strategic direction for research, innovation, and entrepreneurship.
2. Target- Mobilise ₹50,000 crore during 2023–28.
3. Funding Streams- Includes the ANRF Fund, Innovation Fund, Science and Engineering Research Fund, and Special Purpose Funds.

Sector-Specific Policies

National Geospatial Policy, 2022

1. Aims to make India a global leader in the geospatial sector by 2035.
2. Liberalises access to geospatial data for governance, business, and research.

Indian Space Policy, 2023

1. Builds on 2020 reforms to allow non-governmental entities end-to-end participation.
2. Focuses on a flourishing commercial space industry.

National Quantum Mission

1. Allocated ₹6,003.65 crore (2023–31).
2. Focuses on advancing quantum technologies through scientific and industrial R&D.

BioE3 Policy, 2024

1. Encourages creation of Biomanufacturing and Bio-AI hubs and a national Biofoundry network.
2. Aims to accelerate technology development and commercialisation.

Mission-Mode Tech Initiatives

National Supercomputing Mission (NSM)- Launched in 2015 to empower institutions with state-of-the-art supercomputing systems connected via the National Knowledge Network.

India Semiconductor Mission (ISM)- Established in 2021 to build a semiconductor and display manufacturing ecosystem.

Progress- Approved 10 semiconductor projects across six states, including a commercial Silicon Carbide fabrication facility in Odisha.

India AI Mission

1. Vision- "Making AI in India and Making AI Work for India."
2. Infrastructure- Increased computing capacity from 10,000 GPUs to 38,000 GPUs for startups and researchers.

Grassroots & Agricultural Innovation

Atal Innovation Mission (AIM)– Fosters innovation among students, startups, and entrepreneurs at the grassroots level.

National Mission on High-Yielding Seeds– Focuses on developing pest-resistant and climate-resilient seeds, aligning with DBT's agricultural biotechnology efforts.

Seaweed Mission and Learn & Earn Program– Targeted at empowering women entrepreneurs and supporting economic inclusion.

Way Forward

Partnerships– To raise R&D spending, there is a critical need for increased partnerships with the private sector.

Synergies– Efforts must be made to create better synergies between industry, research labs, and educational institutions to broaden research activity and funding support.

New Announcements– The Union Finance Minister has announced initiatives including–

1. Nuclear Energy Mission
2. Clean Tech initiatives
3. Atal Tinkering Labs
4. Centre of Excellence on AI in Education

Source– <https://www.thehindu.com/sci-tech/science/budget-gives-science-missions-big-numbers-but-core-funding-gaps-persist/article70618926.ece>

