

Why sustainable funding matters for India's 'science power' ambition | Explained

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The Ministry of Science and Technology has consistently under-utilised its budget, so while the calls for more funding are legitimate, better budget utilisation is required to affect outcomes

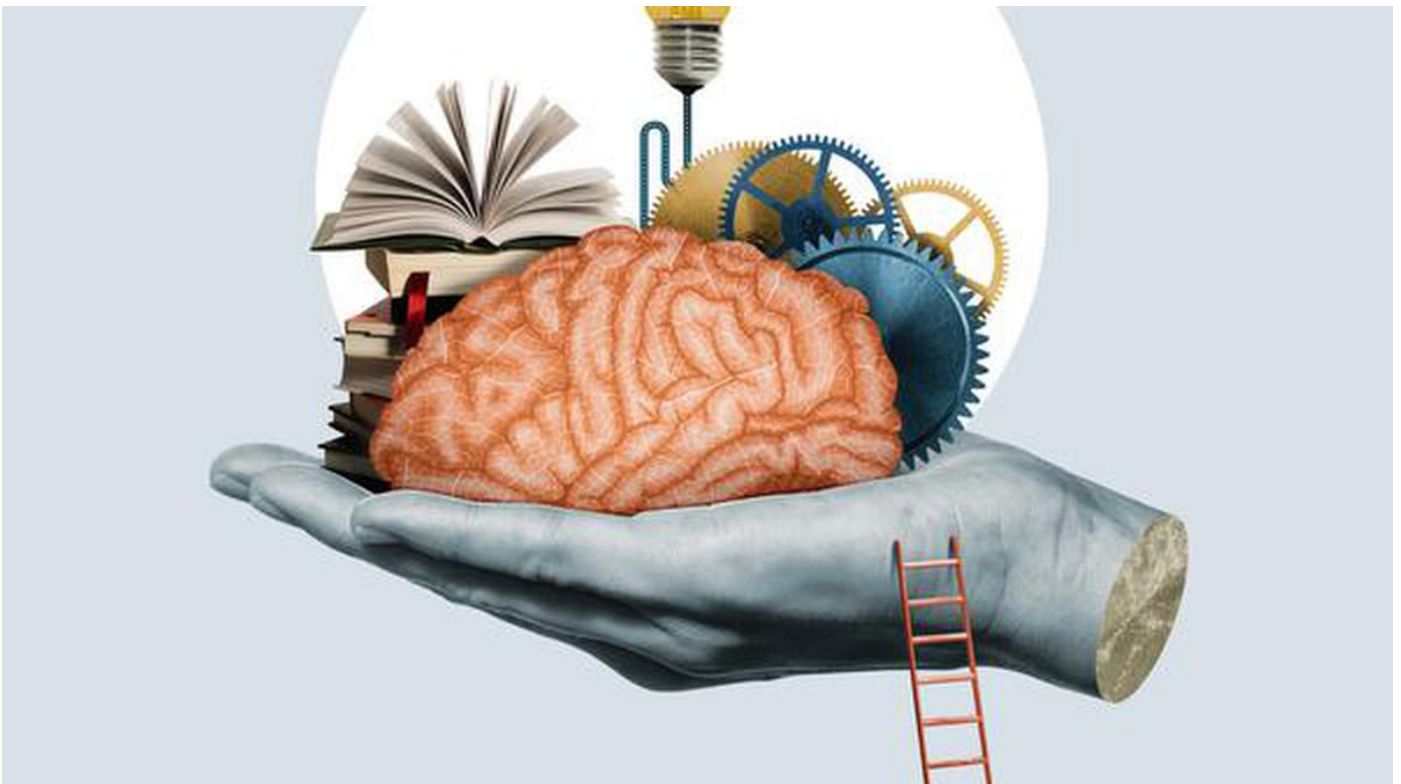
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SHAMBHAVI NAIK

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India's R&D expense has dropped to the current 0.64% of GDP from 0.8% in 2008–2009. | Photo Credit: SvetaZi/Getty Images/iStockphoto

The 2024 theme for National Science Day, which India celebrates every year on February 28, is "Science for Sustainable Development".



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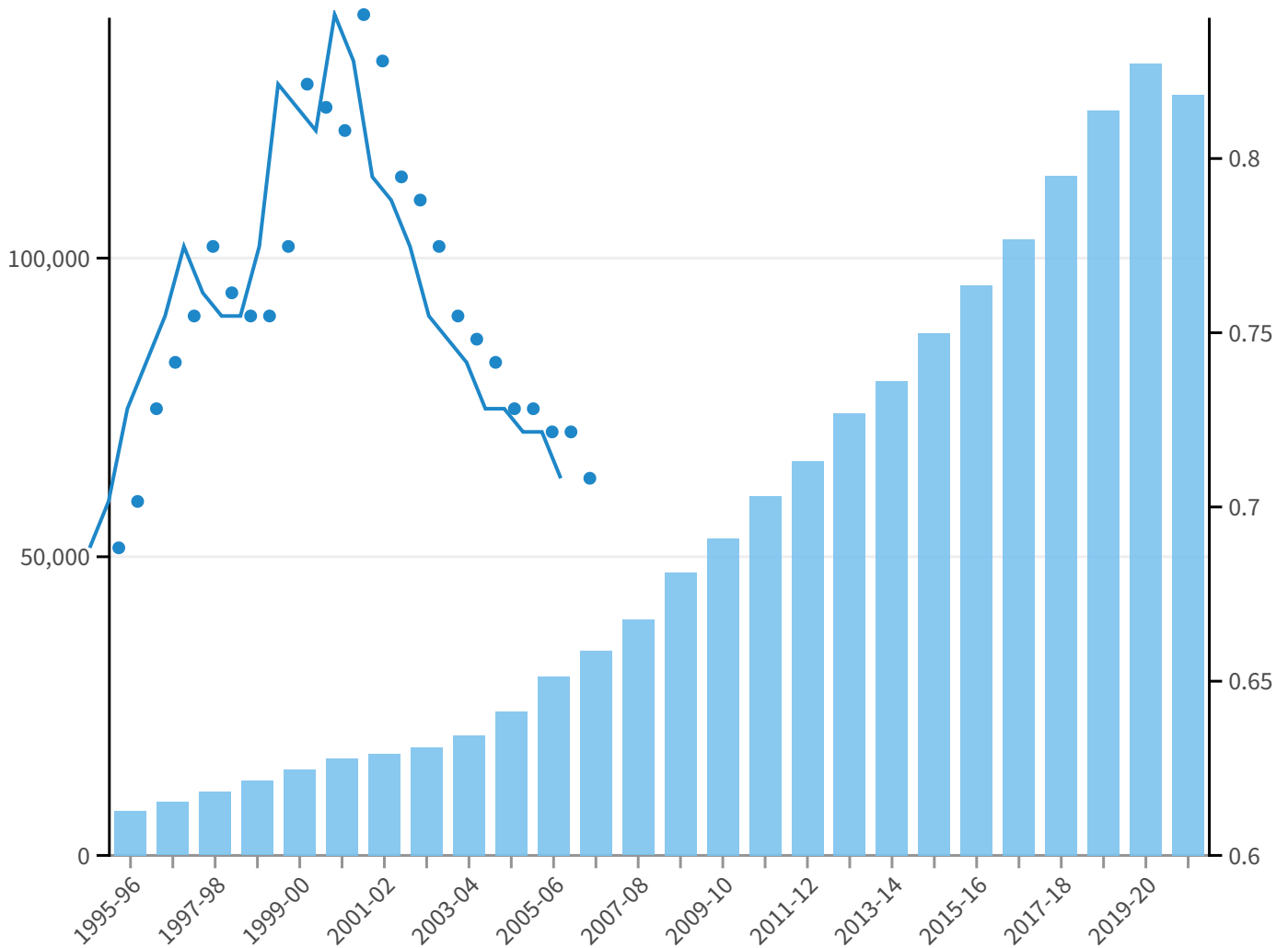
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Science and technological developments are key drivers of India's journey towards becoming a developed country by 2047. India is committed to making this progress through sustainable means, as evidenced by its commitments under the Paris Agreement, participation in global fora for sustainable development, and reinforced in this year's theme for Science Day. The role of science in driving sustainable development doesn't need emphasis, but any conversation on science is incomplete without setting one key expectation: for science to transform India, it has to be sustainably and consistently funded.

How much is India spending on R&D?

Funding for fundamental research in India is amongst the world's lowest, particularly for a country with high science and technology ambitions. In the recent past, India's R&D expense has dropped to the current 0.64% of GDP from 0.8% in 2008-2009 and 0.7% in 2017-2018. This reduced expenditure is worrying considering government agencies themselves have issued several calls to double this spending.

Gross domestic expenditure on R&D as a % of GDP R&D expenditure (in Rs. crore)



✳ A Flourish chart

The 2013 Science, Technology, and Innovation Policy noted that “Increasing Gross Expenditure on R&D (GERD) to 2% GDP has been a national goal for some time”. The 2017-2018 Economic Survey reiterated this in its chapter on science and technology transformation.

The reasons for the reduction in research and development (R&D) spending despite the government being cognisant of the need to increase it are not clear, but may stem from a lack of coordination between government agencies and a need for stronger political will to prioritise R&D expenses.

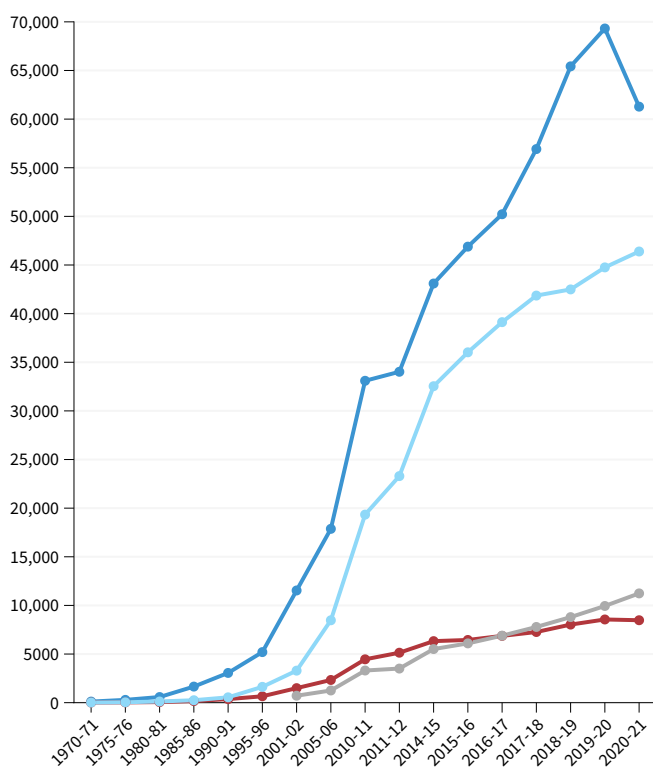
Most developed countries spend between 2% and 4% of their respective GDPs on R&D. In 2021, member-countries of the Organisation for Economic Co-operation and Development (OECD) on average spent 2.7% of GDP on R&D. The U.S. and the U.K. have consistently spent more than 2% of their GDPs on R&D for the past decade. So, many

experts have called for India to spend at least 1%, but ideally 3%, of its GDP every year until 2047 on R&D for science to have a meaningful impact on development.

How can India improve its R&D spending?

Science requires consistent, large-scale investment to bear fruit. For India to reach 'developed nation' status, it needs to spend more to scale R&D than developed countries spend to maintain that status. This is the foundation of the demand to spend at least 3% of the GDP on R&D annually until 2047.

And beyond the current spending being inadequate, its primary dependence on public money signals an immature financing system and weak domestic market. In 2020-2021, private sector industry contributed 36.4% of the GERD whereas the Union government's share was 43.7%. State governments (6.7%), higher education (8.8%), and public sector industry (4.4%) were the other major contributors.



 A Flourish chart

In economically developed countries, a major share – 70% on average – of R&D investment comes from the private sector. The hesitancy of private-sector funding may be because of the poor capacity to evaluate R&D in India, ambiguous regulatory roadmaps that can deter investors, lack of clear exit options for investors in sectors such as biotechnology, and fears of intellectual property rights theft.

While the Anusandhan National Research Foundation was meant to solve some of the financial issues, its implementation has been delayed. The Rs-2,000-crore annual budget the government earmarked for its implementation in the last budget was revised to Rs 258 crores this year. Strategies for how the remaining budget of INR 7200 crore from the private sector is to be raised have also not been clarified yet.

Thus, there is a perceived need to determine the overall quantum of R&D funding and its primary sources, given India's ambition to be a developed country by 2047.

How is the R&D budget utilised?

While the need for India to at least double its R&D investment has been expressed several times, the question of how effectively the allocated money is spent is explored less often. The Union Ministry of Science and Technology has consistently under-utilised its budget, so while the calls for increased funding – through both government and private sources – are legitimate, a strengthened budget utilisation is also required to affect science outcomes.

In 2022-2023, the Department of Biotechnology (DBT), used only 72% of its estimated budget allocation on Centrally Sponsored Schemes/Projects while the Department of Science and Technology (DST) used only 61%. The Department of Scientific and Industrial Research (DSIR), which receives the lowest allocation for Centrally Sponsored Schemes, spent 69% of its allocation.

Such underutilisation is not a one-time error but has been **consistently recorded** over several years to varying degrees. The phenomenon is also not specific to the Science Ministry; given India generally under-spends on R&D, there will likely be a major impact if the allocated funds are spent optimally.

The reasons for under-utilisation, as with the under-allocation, are unclear and may indicate tedious bureaucratic processes for approving disbursements, lack of capacity to evaluate projects or clear utilisation certificates, lack of prioritisation for science funding by the Ministry of Finance or inadequate planning or implementation strategy for the requested funds by the Ministry of Science and Technology.

The lack of capacity also reflects in delays in grant and salary disbursements. Most of these issues can be fixed by proper capacity building within the different governmental agencies.

What does sustainable funding entail?

In the latest budget, Finance Minister Nirmala Sitharaman provided many indications that the government would like R&D expenditure to include more contributions from the private sector. Against this backdrop, mitigating the under-spending and under-utilisation of funds earmarked for R&D stand out as obvious first steps. This in turn requires the political prioritisation of R&D spending and recognition of it as a core, irreplaceable element of India's growth journey.

This prioritisation has to happen not only within the concerned Ministries but also at the Ministry of Finance, which disburses the funds. Incentives for private investment, including relaxation of foreign direct investments, tax rebates, and clear regulatory roadmaps for products will help build investor confidence.

Finally, India also needs the bureaucratic capacity to evaluate science projects and, after allocations, monitor utilisation. Building such capacity is a prerequisite for India becoming a science power by 2047. So this National Science Day, as we celebrate science for sustainable development, let's also remember we need sustainable funding for science.

Shambhavi Naik is a researcher at The Takshashila Institution.



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