

POLICY BRIEF

Rethinking Research Funding for India's Higher Education Institutions

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Executive Summary

India has a complex university-research funding ecosystem with multifarious stakeholders. This policy brief supplements our recently published research report on government research funding in STEM higher education institutions (HEIs). As the country continues to work towards its ambition to increase its percentage of gross expenditure on Research and Development (R&D), the introduction of a national research foundation (NRF) could mark a shift in how it positions itself on the global R&D stage.

Against this backdrop, this policy brief attempts to assist the ideation process of the respective ministries as they also amend their systems amidst growing calls for increased public expenditure on R&D. As India looks to bolster the R&D competitiveness within HEIs, it is important to incorporate provisions that make the entire process of disbursement and grant management more efficient.

We focus on three crucial issues that can enhance the functioning of the country's research funding system from two perspectives—the government authority and the individual researchers.

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We focus on three crucial issues that can enhance the functioning of the country's research funding system from two perspectives—the government authority and the individual researchers.

- » **Transparency** on all material facts and **active communication channels** between the researchers and the funding bodies are vital to ensure the absence of ambiguities and clarity on objectives and demands from the research project
- » Formulating a sophisticated **framework for indirect costs rate(s) determination** is essential for the former to ensure that funds get optimally disbursed
- » A meticulously designed framework for recording **comprehensive and relevant data & information** on R&D expenditures and its management is critical to enhance the efficiency of the ecosystem

Observations, learnings and data from swexisting measures and practices used by the Department of Science and Technology (DST), Ministry of Education (MoE) and other bodies to collect funding-centric information must be considered carefully for deliberations and ideation on the NRF's structure.

The Current Context

Multiple ministries, numerous departments and various subdivisions are responsible for India's R&D government funding ecosystem. Unfortunately, this ecosystem has been plagued with issues of coordination & transparency and has been unable to reach its strategic potential. As a result, for an academic researcher in the country, the framework appears scattered—with variations in rules, lack of comprehensive & accessible data and grievances regarding timely disbursement of funds. The draft National Research Foundation may shine as a ray of hope in this scenario, if conceptualised, structured and implemented successfully. The ideation of this body must take into consideration existing systems, platforms, and loopholes.

Our research report published on this subject preceding this policy brief highlighted multiple issues to be addressed in the Indian university-research funding ecosystem, some of which have been elaborated upon in this policy brief to discuss the possible policy solutions for the same.

This brief discusses the issues of data collection, transparency and communication, and the need for a sophisticated framework for determining indirect cost rates.

As per the "Government of India (Allocation of Business) Rules, 1961", DST has been assigned the task of "management information systems for Science and Technology and coordination thereof" as well as dealing with the "matters regarding Inter-Agency/Inter-Departmental coordination for evolving science and technology missions" (Cabinet Secretariat 2017). However, given the complex structure and involvement of different stakeholders in the country's research ecosystem, a need for an autonomous body (such as NRF) to unify and facilitate coordination between these various stakeholders is apparent. Thus, in this brief, we propose policy solutions that can be adopted by the NRF as well as the existent governmental research funding bodies.

Policy Recommendations

This brief recommends policy measures concerning three major aspects of research funding in India: Data Collection & Management, Indirect Costs Framework and Transparency & Communication. This policy recommendations section argues for an autonomous & unified data and information management system and precise guidelines that promote transparency among stakeholders in the ecosystem. It emphasises on supplementing these suggestions with illustrations from other countries that have adopted similar frameworks.

DATA COLLECTION & MANAGEMENT

The input and output variables attached to government expenditure on R&D projects necessitate collection of accurate and granular data.

Given the massive amount of public funds flowing into HEI-based research projects, it is imperative to record the challenges and conducive factors to the effective utilisation of financial inputs. Second, the impact of these incurred public expenditures must be estimated by employing several indicators that can measure the resultant variations in research productivity, output, patents and economic growth.

A repository of reliable data on research funding, collected at regular intervals, can aid in future deliberations and revisions to India's Science and Technology policy. The National Science and Technology Management Information System (NSTMIS) division was established with this objective in mind. Situated within the Department of Science and Technology (Ministry of Science and

Technology), the NSTMIS conducts frequent reviews of sponsored research in the country, classified on the basis of funding agencies and institutions.

The following table provides a brief overview of three databases maintained by DST

Name of Database ¹	Areas Covered	Characteristics
India Science, Technology and Innovation (ISTI)	<ul style="list-style-type: none"> » Available funding options for Individuals and Institutions » Grants for Seminars and Startups » Summarises all Awards, Schemes, Fellowships, Scholarships and Grants 	<ul style="list-style-type: none"> » Systematic classification of schemes on the basis of themes, administering agencies and innovation-oriented information
S&T Awards Information Retrieval System (STAIRS)	<ul style="list-style-type: none"> » Only covers individual awards for researchers » Awards divided on a thematic basis 	<ul style="list-style-type: none"> » Lifetime achievement awards and internal awards not included » Awards categorised as per the classification used by the sponsoring agency » Open to the public to populate » Less visibility and lack of awareness among end-users of the information » Limited in scope
NSTMIS's Extramural R&D Directory	<ul style="list-style-type: none"> » Trends across the years for DST and other agencies » Consolidated and Granular Data available for funding bodies and HEIs 	<ul style="list-style-type: none"> » Divided on the basis of internal organisation within departments » Under agencies, data can be predominantly filtered along the lines of HEIs' status » Lack of granular data for funding agencies other than DST

Existing measures put into practice by the DST may contain relevant observations on the common hurdles to information collection and loopholes in prevalent systems. For instance, DST's data collection processes are sometimes impaired by unfinished questionnaires or discrepancies in reported statistics. As a consequence, the timely publication of collected information is severely affected. For example, NSTMIS's report titled 'Funding Pattern of Sponsored Research by Scientific Agencies 2005-2010' was published as late as May 2014 (NSTMIS 2014).

In this case, possible steps to ensure the reliability of collected information and a decrease in the period between subsequent surveys are essential. Along these lines, observations from evaluation of the

existing systems can be methodically incorporated into NRF's framework by promoting inter-departmental coordination along the following lines:

1. Designing surveys and drafting questionnaires that can best seek the required data, considering certain individualities of the subfields of Science & Technology.
2. Monitoring responses and encouraging researchers across disciplines, regions and institutes to participate in the data collection process.
3. Consolidating these data points to draw implications and further steps required to improve the research funding ecosystem in the country.

¹ Information on the databases studied:
a) [India Science, Technology and Innovation \(ISTI\)](#)
b) [S&T Awards Information Retrieval System \(STAIRS\)](#)
c) [NSTMIS's Extramural R&D Directory](#) (NSTMIS)

It is difficult to apportion expenditure between teaching and research at the university level, except for sponsored, extramural projects. In the case of external projects, a basic review of several STEM institutes of national importance's website reveals the minimal data made available by the universities. Even if the institutions ensure the availability of data, doubts over its reliability have emerged. For example, in 2019, the Indian Council of Agricultural Research (ICAR) witnessed underreporting of expenditures undertaken by its institutions (Sharma 2019).

The upcoming National Research Foundation can perform the functions of a unified data collection and analysis unit with its dedicated 'Office of Data and Information Management'. With the responsibility of collecting and analysing interoperable information regarding grants and projects, the Office can perform the role of a coordinating body that consolidates information on R&D activities in India. Keen attention should be laid to prevent double counting of information within ministries and departments' expenditure on schemes and programmes to sponsor projects. In order to avoid scenarios such as unavailability/unreliable data, it is vital that all the parties involved—funding bodies, researchers and HEIs—follow uniform and lucid guidelines for budgeting, disbursement and spending throughout the grant period.

INDIRECT COSTS FRAMEWORK

Research costing is acknowledged to be a complex issue that varies as per the context. India's Science and Engineering Research Board (SERB) and Department of Science and Technology (DST) released a set of norms for overhead, travel & contingencies. The norms for overheads, including infrastructural facilities, have indirect cost rates or standard caps depending on the project costing—applicable to individual researchers and groups of researchers funded by the body (SERB 2016). In contrast, funding from various other governmental bodies continues to have varying

guidelines for indirect costs (IDC). Given the vast numbers of universities undertaking research in India and getting funds from various government funding bodies, a systematic approach for the calculation of IDC rates must be adopted, along with a predetermined rate to be followed in case of unprocessed applications or difficult to calculate scenarios, for all government-funded research projects.

Over the last few decades, various models have been developed worldwide for the calculation of indirect costs and continue to be refined, debated and revised. It is important for India to observe these models and develop a clear set of guidelines for research costing as it marks a paradigm shift in its R&D ecosystem, with the introduction of a National Research Foundation. Such guidelines shall aid researchers in the budgeting of funds as well as evaluation of research impact & outputs. India can also look to use this opportunity to evaluate the need for revision of the definition of direct and indirect costs used by governmental R&D funding agencies & HEIs across the country.

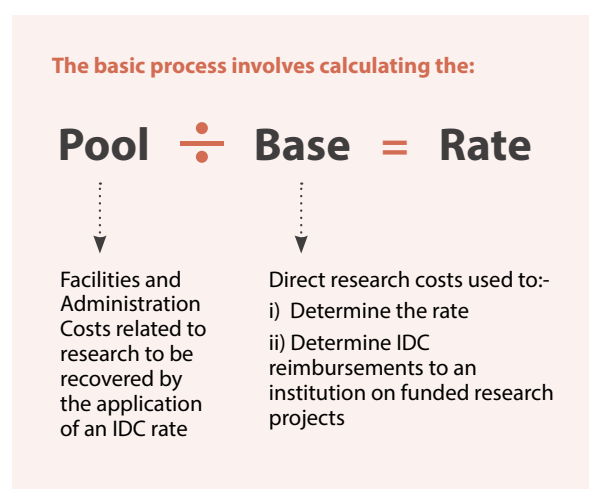
Several countries have pondered on the issue of indirect cost and settled on specific frameworks, fixed rates and cost capping systems. For example, in Japan, overhead charges are 30% of the requested direct costs. Similarly, in Israel, the rate is fixed at 17% (Mehta and Puri 2022). Several countries across the European Union use a flat IDC rate of 25% of direct costs for various research projects. In the year 2000, the Association of Swedish Higher Education (SUHF) made an unsuccessful attempt to reach an agreement with several funding bodies to fix the IDC rate at 35%. Several years hence, a detailed new model was adopted based on audits and participation by specialists and university experts (ESSENCE on Health Research, 2012).

The UK and USA have chosen to adopt a sophisticated system of calculating indirect cost rates for research at academic institutions. The UK Research and Innovation (UKRI) Councils employ the Transparent Approach to Costing (TRAC)². Under this, universities measure their indirect costs rates

2 Transparent Approach to Costing (TRAC) <https://www.ukri.org/news/review-of-transparent-approach-to-costing-trac/>

by following a uniform methodology. UKRI Councils further verify their calculations. These research councils have adopted 'dispensation default rates' for universities whose methodologies are under review and awaiting verification. These are revised annually.

In the USA, the indirect cost (IDC) rate system has evolved from a fixed rate to a sophisticated system of a negotiated indirect cost rate agreement with the host universities. The federal audit of Stanford University in the early 1990s drew massive media attention to the issue of IDC rates—leading to the government's increased efforts in reassessing and scrutinising the federally-funded research costing system (Online Archive of California, 2020). Most recently, the Uniform Guidance released in 2014 required all federal funding agencies to apply the negotiated rates of indirect cost on the federal awards. For colleges & universities, indirect cost rates are negotiated by cognizant agencies (such as the US Department of Health and Human Services (HHS) division of cost allocation) rather than the federal funding bodies (National Institutes of Health (NIH), National Science Foundation (NSF), etc). Though it takes a considerable amount of time to negotiate a rate, the rates are applicable for a period of 4 years. It is utilised for all research grants received by the said academic institution from any federal funding bodies. These rates are determined using the following formula:



Source: Adapted from the NIH website (Rockey 2015)

Indirect costs are typically considered two-fold in the USA. These are facilities & administrative (F&A) costs or overhead costs. Out of the F&A costs, the administrative costs have been capped at 26%. The indirect cost (IDC) rate is applied to the Modified Total Direct Costs (MTDC) base, which specifies which costs are supposed to be included or excluded from the calculation of direct costs. The IDC cannot be charged on the excluded direct costs. In certain cases, a de minimis rate of 10% of the modified total direct costs is also allowed.³

Incentivising cutting down overhead costs through sharing of lab facilities must go hand in hand with the new framework. For example, DST encourages researchers to maximise the use of equipment and allow bona fide use by others in case of idle capacity. However, at the same time, it is observed that the same set of guidelines also states the requirement to receive prior sanctions for utilising equipment acquired using the grant:

"All the assets including equipment acquired and prototypes fabricated from the grant will be the property of Government of India and should not without the prior sanction of the DST, be disposed of, or utilised for purposes other than those for which the grant has been sanctioned" (DST)."

This may increase ambiguity and discourage researchers from providing their equipment to bona fide users in case of idle capacity, thus reducing the chances of usage of equipment to its maximum capacity.

In July 2020, the union agriculture minister revealed that the salary plus admin expenses of ICAR (~ Rs 6000 crores) were approximately 3 times more than its actual research expenditure (~ Rs 2000 crores). Issues such as these prove that the government must urgently rethink research costing and the issue of indirect costs if it intends to optimise the crores of rupees it spends on R&D every year (FE Bureau, 2020). Additionally, in the initial years of implementation of the selected framework, India must look to conduct periodic surveys to analyse the

³ Information of IDC Rates and the applicability of a de minimis IDC rate in USA <https://www.nsf.gov/bfa/dias/caar/indirect.jsp#:~:text=The%20Federal%20government%20in%20general,or%20subcontracts%20that%20exceed%20%2425%2C000>



IDC difference it has in relation to the actual indirect costs incurred by institutions/projects.

TRANSPARENCY & COMMUNICATION

The new reforms envisioned under the National Research Foundation's framework would remain incomplete until appropriate channels for information exchange are made available to Principal Investigators (PIs) and HEIs. Institutions and researchers' feedback and suggestions on funding opportunities can substantially contribute towards positive revisions in the policy formulation and implementation processes. Relevant observations drawn from past awardees and applicants' experiences can be incorporated during review to boost research productivity and efficacy of public R&D expenditure.

In this regard, the NRF aims to fulfil a long-standing demand for sharing feedback with all applicants for a particular opportunity, regardless of the outcome of their proposals. A sophisticated system that bridges the communication gap between stakeholders would encourage researchers to work on their shortcomings and submit modified proposals in future that conform to the agency's discipline-specific, administrative, and financial requisites. In addition, the envisioned system must provide for periodic reviews to investigate whether the established metrics of evaluating proposals are

adequate, predeclared and implemented objectively.

In our recent study, *Research Funding for STEM Higher Education Institutions - An Analysis of India vs International Models*, it was found that several marquee schemes' announcements lacked critical information regarding selection criteria and funds disbursement that could impair a researcher's ability to self-assess the suitability of their proposal (Mehta and Puri 2022). Given the significance of accessible information during grant writing, India's existing research ecosystem requires more efforts in the transparency and communications sphere.

India's funding agencies can create more mediums for information sharing, expanding beyond written circulars to include audio-visual aids such as webinars and instructional videos. The USA's NIH is one example of achieving this transition to increased online presence of agencies. The NIH uses embedded videos on its website to articulate the various components, stages and structures of indirect costs (Rockey 2015). Such clear pathways for broadcasting information and collective deliberations (in webinars) would empower researchers in India to determine their fit for a funding programme and adhere to the agency's administrative and financial necessities.

Similarly, the Department of Biotechnology (DBT) introduced the 'New Competitive Grant



Management System’ that outlined the entire review process and the expected duration of the same to researchers. In 2019, DBT conducted a six-session Webinar Series to explain the numerous types, components and requirements of research funding provided by the agency (IndiaBioscience 2019). Since then, the restrictions imposed by the COVID-19 pandemic have augmented researchers’ receptivity towards video conferencing platforms. The NRF can leverage the rapid digitalisation and growing familiarity with online forums among researchers and utilise it to spread awareness among applicants.

Clear channels of communication can be infused into the existing ecosystem in two phases:

- 1. Pre-Award**
- 2. Post-Award**

In the pre-award stage, funding agencies can organise seminars inviting previous recipients of funding opportunities to assist applicants in grant writing, budget formulation and compliance requirements. These sessions can also provide insights on the respective funding body—its schemes, opportunities of collaboration and funds disbursement provisions. Furthermore, sufficient attention must also be paid to the proposal’s non-research aspects such as institutional facilities required, international collaborations and salaries

of temporary employees. In the Post-Award phase, the onus of ensuring information symmetry must be distinctly divided between the government authority and the PIs/HEIs. Specifically, the terms and conditions associated with funds disbursement must be unequivocally discussed and agreed upon to make certain that funds are utilised efficiently and in the manner explained in the proposal.

A detailed guideline system, akin to South Korea’s ‘Guidelines for Proper Spending of NRF Funding’ would help Indian governmental funding bodies to consolidate the diverse rules and compliance requirements for funds disbursement. The aforementioned South Korean guidelines extensively cover various scenarios that may arise during the grant period and linearly convey the essential paperwork required from researchers to manage the situations.

In India, the NRF can similarly ruminate about an embrative document that delineates the various components of grant funding and their usage. This would create a uniform framework that researchers and administrators can refer to in times of ambiguities. It shall also serve the secondary purpose of strengthening the demand for transparency and clear guidelines from other funding agencies. NRF striving towards an all-embracing guideline would act as an impetus for other funding agencies in the country to initiate deliberations on the same.

Conclusion

This policy brief proposes actionable recommendations that can supplement the policy-oriented discussions regarding NRF, DST and other funding bodies in India. The above-discussed suggestions are drawn from the features and limitations of existing R&D systems in India as well as other countries. The autonomous nature of the envisioned NRF would strengthen its role as a coordinating body for national, state and private funding agencies in the country. Given its immense potential for India's research funding framework, the brief highlights three aspects that can be targeted to improve the efficiency of the system.

These recommendations aim to boost stakeholder participation, ensuring that transparency, accessibility and availability of information, and lucid guidelines are at the forefront of researcher engagements with the funding agencies. As a result, the recommendations seek to uphold HEIs and researchers as integral parts of the proposed system, positioning them as indispensable stakeholders in policy formulation. Adoption of these recommendations would also encourage other government departments to explore similar frameworks to govern their funding opportunities. This ripple effect would, in turn, enhance the quality of projects funded and support researchers in their quest for scientific discovery and advancement.

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