Workshop on Research Assessment Practices in Indian Funding Agencies

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Executive Summary: Major funding agencies in India mainly determine the national research agenda. They remain essential stakeholders in research assessment and fund a significant number of projects across the nation. The Department of Science and Technology, Ministry of Science and Technology, Government of India convened a workshop on April 21, 2022 to understand how the funding agencies assess research projects, where these agencies stand in addressing the inherent challenges of evaluating impactful research, and how to ensure a responsible research culture. The workshop had two objectives: to understand the current research assessment practices of India's funding agencies and to explore the adoption of broad-based assessment criteria beyond journal-based matrices, incorporating national priorities, Sustainable Development Goals (SDG) targets, and the societal impact of research into the research assessment frameworks. This report discusses the workshop's objective and structure, each component of the workshop and its intended outcomes, and policy recommendations for funding agencies in the research ecosystem.

The intended audiences for this report are funding agencies, constituents of national and state universities, internal funding committees, and those who want to acquire a broader perspective on existing research assessment practices, look beyond the quantitative journal indicator-based metrics and make existing assessment practices more effective and inclusive. This report aims to assist in developing research assessment agendas that balance local relevance and globalization.

I. Introduction

Numerous global concerns, such as climate change, agricultural sustainability, and renewable power transitions, require immediate attention from the international scientific community to safeguard humanity's future. The United Nations' Sustainable Development Goals (SDGs) provide roadmaps to address these challenges while promoting socioeconomic and planetary well-being, adopted in 2015 as part of the 2030 Agenda for Sustainable Development (United Nations Organization 2022). While research to understand these changing circumstances has been ongoing, most of these studies are undertaken by researchers from the Global North. Moreover, funding agencies in countries such as India do not actively incentivize high-risk, high-reward research to address these wicked challenges (Bhattacharya & Packalen 2020). One significant challenge in science funding is identifying responsible research assessments to set equitable assessment metrics and research cultures globally.

Currently, most organizations assess research using journal-based metrics, such as impact factor and h-index. (Wouters 2014, 47-66). These metrics were initially helpful and informative, but became overexploited tools as they proliferated. Journal

impact factor (JIF), for example, was introduced to help librarians choose the relevant journals for their respective universities, not to assess research quality (McKiernan et al. 2019). Institutions, however, utilize such metrics without considering the purpose of the evaluation. Indian academic systems are not an exception. Quantitative metrics, like the number of publications, JIF, and citation index, are significant in evaluating institutions and individuals. Over-emphasizing and abusing these metrics, particularly JIF, has led to the quality of research being evaluated based solely on quantitative factors.

In addition to overutilization of standards intended to support a qualitative evaluation, quantitative metrics are misused as proxies for research impact and quality. Consequently, niche research focusing on societal impacts and SDGs is frequently overlooked, as are merits including research originality, plausibility, and soundness (Aksnes, Langfeldt, and Wouters 2019). Qualitative assessments evaluate research proposals for breadth of impact, contributions to science and society, intellectual merit, and epistemic and disciplinary differences, thereby providing robust, transparent, diverse, and reflexive assessments (Langfeldt, Reymart, and Aksnes 2021; Taylor and Francis 2023). Quantitative metrics, therefore, need to be complemented with qualitative metrics that evaluate novelty, scientific value, research integrity, potential for innovation, and societal outcomes.

While there have been dialogues for reform, the debate over effective research assessment metrics has yet to gain traction. It is essential for India to set responsible assessment priorities amid calls for increased science funding, the establishment of the National Research Foundation, and efforts to increase private sector participation and Gross Expenditure on R&D (GERD). Responsible metrics movements around the globe, including the Leiden Manifesto (Hicks et al. 2015) and DORA Declaration (DORA 2022), are crucial in spreading awareness of holistic metrics for evaluating research. India's proposed Fifth Draft STI Policy 2020 (DST 2020) also calls for a broad-based approach to research assessment to progress the national research agenda. Radical, ambitious research reforms will require significant support from the research assessment framework. Their institutional capacities to incorporate and integrate new criteria into their present assessment process will also need to be assessed.

Funding agencies continue to be significant stakeholders in research assessment evaluations. They fund multitudes of research projects by institutions and academics around the nation and play a pivotal role in determining the national research agenda. One significant challenge for funding agencies and research universities is to support high-quality research aligned with national and SDG priorities (Kraemer-Mbula 2020, 79-81). Accordingly, it is vital to comprehend how these organizations craft the research agenda and conduct assessments. This need prompted the workshop on Research Assessment Practices in Indian Funding Agencies. The workshop aimed to understand where Indian funding agencies stand in addressing these issues and ensuring a responsible research culture. The Department of Science and Technology, Ministry of Science and Technology, Government of India, convened the workshop. Officials from major science funding agencies of the country – Department of Science and Technology (DST), Department of Biotechnology (DBT), Council of Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR), and Science and Engineering Research Board (SERB) - participated in the discourse.

II. Workshop structure

i. Structure of the workshop

The one-day research assessment workshop was designed to explore Indian funding agencies' current research assessment practices. It was structured to understand the assessment practices used by these agencies, as well as to recognize their strengths and weaknesses. The first half of the workshop was conducted through interactive exercises and discussions among participants. These participants were scientists from the represented agencies and were actively involved in research assessment activities. The participating scientists were nominated by their funding organizations based on their understanding of the research evaluation standards utilized by each agency. The second half of the workshop was a panel discussion on workshop outcomes involving senior leaders for these agencies

and engaged in dialogue with funding agency stakeholders about the future of research assessment. The structure of the workshop is detailed below.

ii. Session one: welcome session

Welcome address by Dr. Akhilesh Gupta, Senior Adviser and Head, Policy Coordination and Program Management (PCPM) Division, Department of Science & Technology (DST), Ministry of Science & Technology (MoS&T), Government of India (GoI)

Introduction to the workshop

iii. Session two: hands-on workshop on research assessment practices of national funding agencies

Introduction to the SCOPE Framework

Activity one: What do you value about the entity you seek to evaluate?

Activity two: The Balancing Act-Quantitative vs. Qualitative Evaluation

Activity three: Who, How, and What—Exploring the Weaknesses

Activity four: Evaluating the evaluation

Concluding Remarks

Vote of Thanks

iv. Session Three: panel discussion—the future of research assessment in Indian academia

Introduction

Summary of session two findings

Remarks by Guest of Honor, Panel Chair, and Panel members.

Guest of Honor: Dr. Srivari Chandrasekhar, Secretary, DST, MoS&T, GoI

Panel Chair: Dr. Akhilesh Gupta, Senior Adviser, and Head, Senior Adviser and Head, PCPM Division, DST, MoS&T, GoI

Open discussions and comments by attendees

Vote of thanks

III. Workshop structure

The workshop started with a welcome speech and an introductory talk that outlined the workshop's objectives. It particularly emphasized the importance of an engaged discussion with participants from funding agencies about research assessment practices (session one, thirty minutes). After the inaugural session, a brief presentation of the SCOPE framework (INORMS 2021) leads to the main activity session (session two, three hours).

The SCOPE framework, developed by the International Network of Research Management Societies (INORMS) Research Evaluation Group (REG), provides a five-step approach to designing a robust and responsible research assessment framework. SCOPE is an acronym defined as follows: S- Start with what you value; C- Context considerations; O- Options for evaluating; P- Probe deeply; and E- Evaluate your evaluation. The framework emphasized integrating academic rigor in research management and assessment practices and was used for the workshop with funding agencies. The framework is further explained in the appendix.

Activities conducted during the workshop were designed within the SCOPE framework to help the organizers understand the subjective perception of research assessment processes in the funding agencies. The participants were handed four activity worksheets with dot exercises and open-ended questions. All the activity worksheets were retrieved after the session, and the responses were analyzed to understand the assessment practices, process, objectives, and perceived effectiveness by the representatives of the funding agencies.

After lunch, the third session began with an opening statement from Dr. Srivari Chandrasekhar, Secretary, DST. He discussed the state of the current research assessment within Indian funding agencies. He also spoke on funding organizations' obligation to develop a responsible research assessment ecosystem in India with contextualization based on India's national and regional priorities. Dr. Akhilesh Gupta, Senior Adviser and Head, DST, presided over the panel discussion, which included senior representatives and science administrators from national funding agencies. The summaries of outcomes from activities in Session Two were outlined in the panel discussion to give an overview of the various research evaluation processes used by different funding agencies in the country. A vote of

gratitude followed an hour-long hybrid panel discussion.

IV. Discussion

Various structural components were utilized during the workshop, the most significant being the SCOPE framework. This framework involves five phases of value-driven strategies for research evaluation. However, to suit the Indian funding agency context, only four steps of the SCOPE framework were utilized. Activities and exercises created based on this framework facilitated the discussions on how to evaluate research beyond quantitative metrics and indicators. The participating scientists quickly engaged with the framework and provided perceptive remarks on the present systems' evaluation ethos, structures, and procedures for evaluating research and adaptive improvements to them. Furthermore, they offered constructive criticisms and recommendations for potential changes to the framework for research assessment in their funding agencies.

The workshop's primary objective was to understand how India's funding agencies conduct intramural and extramural research assessments. In the first activity, participants were asked open- and closed-ended questions to gain insight into the entities they evaluate. The questions prompted participants to explore how research proposal assessment mechanisms function, including the super-values, values, and sub-values prioritized by the evaluators, as well as other variables that influence funding decisions. The second activity aimed to investigate how research assessment frameworks can adapt to the evolving requirements of balancing quantitative and qualitative indicators. The third activity explored the strengths and weaknesses of the current research assessment framework. Questions targeted exploitable loopholes in the current evaluation framework and how funding agencies support risk-taking proposals. Finally, activity four gathered input as to how the community could develop a responsible and adequate research assessment framework. Participants completed each activity in approximately thirty minutes using a pen and writing pad. Organizers clarified activities for participants.

The panel discussion, which included senior officials from national funding agencies and science administrators, was one of the workshop's distinctive features and allowed for an exciting discussion on the future of research assessment. Dr. Srivari Chandrasekhar opened the discussion by greeting participants and remarking on the existing assessment framework in India's research ecosystem. He briefly outlined the inadequacies in the evaluation process from the funding agency and the applicant's viewpoints. Reflecting on the growing importance of alternate evaluation systems, he highlighted the need for stakeholder dialogues to develop a better research assessment framework compatible with the Indian research ecosystem. Following the remarks, the moderators presented an overview of the responses from the workshop activities. This gave participants and panel members an understanding of the varied evaluation techniques within the Indian research ecosystem. Panel members then spoke, prompting an excellent debate and interaction that helped participants reflect on the deficiencies in the present assessment system and alternative recommendations that may be incorporated for a balanced assessment. The panelists agreed that the first step should be to identify the research and assessment techniques on a case-by-case basis and not have the same criteria for all calls for proposals. The panelists criticized a one-size-fits-all evaluation technique that could lead to a futile attempt to create recommendations for research assessment.

V. Key takeaways

The workshop had four main activities with four essential questions that the participants individually considered.

i. What do you value about the entity you seek to evaluate?

1.1) Who decides the assessment framework in your research program?

While the general practice in DST and SERB is decided jointly by the grants management team and the external peer review committee, in a few cases, it is solely determined by either the external committee or the grants management team of the program division; in DBT, CSIR, and ICMR it is jointly

decided by the internal grants management team and the external peer review committee.

1.2) How frequently are the evaluation committees and frameworks revised in your research program?

Generally, the selection committee is revised every three years, but certain programs of ICMR revise annually. The revision of assessment frameworks is more varied, even within individual agencies. Minor edits happen annually if needed, while major restructuring happens every three to five years.

1.3) In your research program/organization, what do you look for when assessing research/researchers?

When funding new research, funding agencies look for the proposed research's societal impact, interdisciplinarity, translational aspects, alignment to national missions and goals, and policy-level deliverables.

These super-values, at a granular level, are assessed through the lens of the research leadership of the applicants, their ability to attract extramural funding, industry and stakeholder networks, the methodology of the proposed research, and their innovation and scalability.

1.4) On a scale of 1-9, 9 being the highest score and one being the lowest, how important are the following factors while assessing an applicant/project?

Particulars	**Average score**
Number of publications/patents/research projects	6
Journal impact factors	6
h-index	6
Educational background	6
Affiliation	5
Professional experiences	7
Research background (overall)	7
Research background (in proposed research area)	8

Table 1: Average score for each research assessment criterion reported during activity one.

The findings indicate that while research quality is essential, quantitative metrics are still valued highly in assessment criteria.

ii. The Balancing Act - Quantitative vs. Qualitative Evaluation

To make the project assessment framework adaptive to changing needs, DST, SERB, ICMR, and CSIR focus on national priorities and encourage a problem-solving approach in the research proposals they fund. The expert committee is also constituted with evolved expertise to identify proposals that aim toward the aspects mentioned above. Disciplinary contexts and the differentials within are deeply integrated.

DBT focuses on the translational potential of the proposed research, and the grants management team and review committee keep track of the evaluation parameters that the US, UK, EU, and others employ and tries to match them based on national priorities.

iii. Who, how, and what—exploring the weaknesses

This activity focused on three themes: loopholes in the funding process that can be manipulated or sidestepped, how funding agencies accommodate risk-taking projects, and how they encourage collaboration and team science.

The workshop identified several loopholes in the funding process, including contacting the reviewer for favorable results, hiding negative results and conflicts of interest, and false claims of expertise. Blacklisting candidates is the only measure funding agencies currently use to discourage such behavior.

Only SERB has a dedicated call for proposals for high-risk research (SERB-Scientific and Useful Profound Research Advancement). Other funding agencies only fund high-risk research on a case-by-case basis, depending on recommendations from expert committees. Funding agencies otherwise do not actively or passively encourage risk-taking proposals.

While official provisions do not selectively encourage collaboration, calls are present in each agency specifically aimed toward collaborative projects. Again, SERB has schemes that are

specifically for multi-institutional, collaborative projects.

iv. Evaluating the evaluation

These earlier activities reinvestigated the national funding agencies' assessment process and evaluated their strengths and weaknesses. Activity four recommended changes based on those understandings to make the review system more efficient. Some thoughts and recommendations that emerged from the discussion are as follows:

1) Assessment frameworks and review committees should be periodically reviewed. The assessment framework needs to be examined more frequently, and changes based on global and national priorities must be incorporated. Similarly, the review committee needs to be reviewed more regularly. Membership should include more diverse stakeholders from industry and impacted communities, not just senior academics.

2) Inclusion of international experts in review committees would be a welcome change to integrate a global outlook in funded research and bring a broader perspective to the committee.

3) The evaluation format needs to include qualitative metrics that address ethics, societal impact, translational value, conflict of interest, and novelty.

4) The assessment framework should be more inclusive and customized to provide opportunities to currently disadvantaged researchers. There is a need to develop a better research ecosystem and connect all the national and local stakeholders, including research institutions, universities, industries, and society.

5) Proposals should undergo double-anonymous review. This procedure will minimize the existing halo effect on researchers from well-known institutions.

VI. Policy recommendations

Key policy recommendations coming out of the deliberations, especially the panel discussion with science administrators from the national funding agencies, are noted below:

1) Introduce a double anonymous review system to remove bias from the review process.

2) Conduct workshops for reviewers on assessing proposals better while considering the changing research and assessment priorities. Workshops for researchers are also necessary on how to write better proposals.

3) Introduce accountability and monitoring of fund utilization to understand the scientific and social contribution of research funding.

4) Improve the selection of review committee experts by seeking individuals with extensive knowledge in the discipline or subdiscipline they are reviewing and who are ethical and honest in their review process.

5) Critically evaluate how projects are deemed necessary, especially for high-risk projects. At present, the publication is the only outcome used to measure success. In the case of high-risk projects, however, a researcher may wait to produce any paper until the end of the proposed period. Yhese aspects must be acknowledged and integrated into the assessment process to encourage better science and innovation.

6) Themes identified for funding calls should be concurrent to India's national priorities, rather than those of international agencies or American and European countries.

7) A complex but flexible assessment framework is needed that considers the diversity of discipline and sub-disciplines, inclusivity, the need for interdisciplinarity and team science, and novelty and innovativeness of the outcome.

8) Collaboration is the key to delivering socially impactful research. To ensure resources - both financial and human - are utilized optimally, a collaboration between premier institutions and Tier II/III institutions must be encouraged through research funding.

9) The project evaluation mechanism should address the bias towards premier institutions and bring

diversity in institutions and regions, geographical areas, gender, communities, and so on.

10) To expand the pool of reviewers, retired scientists can be involved in the system and act as mentors to current researchers. They can be incentivized with honoraria for their engagement.

VII. Conclusions

Indian research funding agencies play a central role in supporting and financing scientific and technological research in India. They significantly shape the country's research culture through the policies and programs they promote or discourage. This workshop aimed to comprehend their research evaluation procedures, identify the strengths and limitations of the current process, and initiate a conversation about the required improvements to advance superior research and innovation.

The commonly used research evaluation process in India consists of a quantitative, metric-based screening process followed by an expert peer review. Even though peer review introduces a qualitative aspect to the evaluation process, it is not free of institutional bias and overreliance on metrics such as h-index, JIF, publication count, and the funding a researcher previously secured. Moreover, the present system only encourages risk-taking and collaborative research projects in specific circumstances. Additionally, the limited capacity of funding agencies in processing a large volume of applications and a small pool of over-burdened reviewers creates injustice in the overall outcome of funding decisions.

At this point, the Indian research funding agencies should go beyond their static evaluation criteria and focus on research excellence, integrate diversity and equity into research, encourage the social impact of science, and foster innovation. However, there needs to be a comprehensive evaluation framework or a review panel that considers these factors. Capacity building of reviewers is also necessary to enhance their understanding of what responsible research assessment is, the nuances of a more responsible qualitative assessment, and how to integrate the learnings in their capacity as reviewers. Institutions and funding agencies should appoint grant management teams to improve the research funding ecosystem in the country.

Together, the policy suggestions generated from this workshop can provide valuable guidance for the funding agencies to act and implement the necessary changes.

Appendix A: Overview of the SCOPE framework: a five-stage process for evaluating research responsibly

The activities conducted during the workshop were designed within the SCOPE framework, a five-step responsible research evaluation approach developed by the International Network of Research Management Societies (INORMS) Research Evaluation Group (REG) (INORMS 2021). By creating a practical and feasible five-stage process that allows for the development of better value-driven research evaluation approaches, the INORMS REG has attempted to address the issue of creating a responsible research evaluation framework and effectively putting it into practice.

The five stages of the framework are as follows:

- START with what you value
- CONTEXT considerations
- OPTIONS for evaluating
- PROBE deeply
- EVALUATE your evaluation

Three basic concept that guides the five stages of SCOPE are:

- Evaluate only where necessary
- Evaluate with the evaluated.
- Draw on evaluation expertise.
- Workshop activities worksheets

Appendix B: Activity worksheets

i. Activity one

1) Who decides the assessment framework in your research program?

- Internally by funding agency
- External committee
- Both

2) How frequently are the Selection Committee and Assessment Framework revised in your research program?

- Every Year
- Every 3 Years
- Every 5 Years
- More than 5 Years

3) In your research program/organization, what do you look for as super values, values, sub-values?
4) How do you arrive at the final decision on the selection of a project proposal? (Please write the steps involved)
5) What do you specifically look for in the project applicant's profile? Please rate the following options according to their importance between 1-9, 9 being the highest and one being the lowest:

The number of publications/ patents/ research projects, Journal Impact Factors, h-index, educational background, Affiliation, Professional experiences, Research background (overall), Research background (in proposed research area), and any other (please specify).

ii. Activity two
1) What steps are taken to make the project assessment framework evolve/adaptive to changing needs?

iii. Activity three
1) In your opinion, how can the assessment framework be side-stepped by the applicants?
2) How do you accommodate risk-taking project proposals?
3) How do you encourage collaborative projects?

iv. Activity Four
1) What changes would you suggest in the existing assessment framework of your research division/organization?

Appendix C: Workshop organizers and panelists
The names and affiliations of the individuals associated with this workshop at the time of the event are included below.

i. Workshop organizers

- Dr. Akhilesh Gupta, Senior Adviser, and Head, Senior Adviser and Head, PCPM Division, Department of Science & Technology, Ministry of Science & Technology, Govt. of India
- Bhattacharjee Suchiradipta, Senior Policy Fellow, DST-Centre for Policy Research, Indian Institute of Technology, Delhi, New Delhi, India
- Moumita Koley, Post-Doctoral Fellow DST-Centre for Policy Research, Indian Institute of Science, Bengaluru, Karnataka, India
- Dr. Rabindra Panigrahy, Scientist E, PCPM Division, Department of Science & Technology, Ministry of Science & Technology, Govt. of India

ii. Panel discussion
Guest of Honor: Dr. Srivari Chandrasekhar, Secretary, Department of Science & Technology, Ministry of Science & Technology, Govt. of India

Panel chair: Dr. Akhilesh Gupta, Senior Adviser and Head, PCPM Division, Department of Science & Technology, Ministry of Science & Technology, Govt. of India

Panel members:

- Dr. Anita Gupta, Head, Technology Missions Division (Energy, Water & all Other), Department of Science & Technology, Ministry of Science & Technology, Govt. of India
- Dr. Sanjeev Varshney, Head, Division of International Cooperation, Department of Science & Technology, Ministry of Science & Technology, Govt. of India
- Dr. Nisha Mendiratta Head, Climate Change Program, Department of Science & Technology, Ministry of Science & Technology, Govt. of India
- Dr. S. K. Tiwari, Chief Scientist, CSIR-NBRI, Lucknow, Uttar Pradesh

- Dr. M. Mohanty, Scientist E, Earth & Atmospheric Sciences Division, Science and Engineering Research Board (SERB), New Delhi
- Dr. Nabendu Chatterjee, Scientist G, and Head, Basic Medical Sciences (BMS), Division, ICMR - NIIH, Mumbai
- Dr. Sarah Sabu Cherian, Scientist G, ICMR National Institute of Virology (NIV), Pune

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Bhattacharjee Suchiradipta is a social scientist with a Ph.D. in Agricultural Extension. Her work revolves around understanding what it takes to sustainably transition to better food systems in low- and middle-income economies. She focuses on theory building and providing evidence for sustainable food system transformation from an agricultural innovation systems perspective in the context of climate change.

Moumita Koley is a scientist who worked in the wet lab, synthesized new biologically active compounds, and designed novel synthetic routes using metal and enzyme as catalysts. Now, she is exploring a few questions: how to make the research ecosystem more responsible, how to make research respond to local problems, and how to drive and fund the research that matters most.

Jahnab Bharadwaj is currently engaged as a Project Intern for the DORA Community Engagement Grant funded project "Exploring current research assessment practices in Indian academia." He completed his Masters in Sociology from Delhi School of Economics in 2022.