

SciComm ThinkLabs

**Towards Strengthening Science and
Society Connect in India**

FINAL REPORT
2024

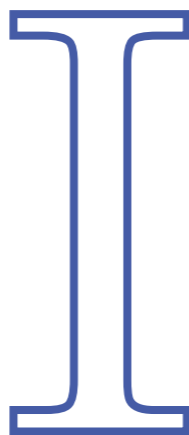




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Executive Summary



The **SciComm ThinkLabs** initiative, launched by **Foundation for Advancing Science and Technology (FAST India)** in July 2023, brought together 16 science communicators and researchers from across India to study and develop recommendations to strengthen the Science Communication (SciComm) ecosystem in the country. Through a six-month collaborative effort, four Working Groups (WGs) were formed to explore key themes: **Landscape of SciComm and Public Engagement (PE), Scope and Function of Institutional SciComm and PE, Capacity Building in SciComm, and Science and Media Connect**. The WGs presented the findings and recommendations at SciComm Huddle 2024, preceding FAST India's **India Science Festival** at IISER Pune on 20 January, 2024.

The recommendations emerging from SciComm ThinkLabs and the subsequent SciCommHuddle are directed towards various stakeholders involved in SciComm / PE in India. In addition to these recommendations, the report includes resources developed by the WGs, such as the **SciComm Readiness Tool** for scientific institutions, a **Customisable Modular Framework for SciComm Training**

Courses, and a Framework for a Science Journalist Residency Programme. Each chapter provides an in-depth understanding of the recommendations and their implications.

Overall, this report provides a first-of-its-kind analysis of SciComm as well as recommendations and resources for streamlining and strengthening public engagement with science in India, emphasising collaboration, innovation, and inclusivity across all stakeholders.

This report can be cited as:
SciComm ThinkLabs Report, FAST India, May 2024.

ABOUT FAST INDIA

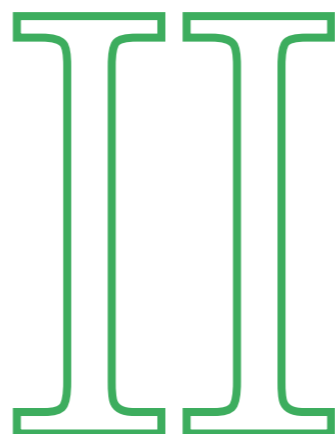
FAST India is a non-profit institution of excellence dedicated to building capacity and advancing policy solutions that foster scientific enquiry and research, and facilitate the creation, dissemination, and translation of new scientific knowledge. The foundation works with a variety of stakeholders to develop and strengthen the science ecosystem in India in order to advance scientific research and its translation into economic value and social good. FAST India has five key verticals – policy and research, government support, institutional strengthening, corporate sector engagement, and science communication.

ABOUT INDIA SCIENCE FESTIVAL

FAST India's annual flagship event, India Science Festival, is the largest non-governmental platform for public celebration of science. ISF was launched in 2020 with the aim to inspire and engage youth to experience the joy of doing science, close the gap between science practitioners (scientists, science institutions, policy and industry) and the wider community, and conduct serious deliberations on how to make India a top three Science & Technology nation.



Introduction



Science Communication or SciComm, a term more commonly used in India compared to Public Engagement (PE) or Science Engagement, to describe the process of communicating scientific information and engaging with the public has garnered significant attention over the past decade in India and globally. SciComm is seen as a crucial bridge between science, policy and society.

With over 22 official languages, a rapidly growing economy, and a vast and diverse youth population, SciComm in India presents a unique and complex challenge to its practitioners. Although SciComm itself isn't novel¹ in our country, it is currently undergoing a transformation, adopting a fresh perspective and sensibility in a technologically advanced and globally connected world. The Indian government has issued guidelines for Scientific Social Responsibility (SSR)² and included a chapter on SciComm and PE in the draft Science, Technology, and Innovation Policy (STIP) 2020³ for the first time. This signals a growing recognition of the importance of SciComm, as also evidenced by the increasing number of individuals pursuing it as a full-time

profession. Indian universities, research institutions, industry, and government departments are now actively seeking to employ SciComm professionals. This trend is further supported by the emergence of new organisations dedicated to promoting SciComm, along with the rise of innovative public events and festivals aimed at engaging the broader community³.

Despite these strides, however, the field of SciComm in India remains amateurish, fragmented, and lacks clear aims and benchmarks, especially when compared to more developed S&T and SciComm ecosystems. While informal science education initiatives targeted at schools and colleges have been a strong goal of SciComm in our country, we have not yet fully utilised the potential of SciComm as a tool for public awareness, dialogue, and action. For instance, there are barely any popular Indian social media channels, books, TV shows or films on science, or for that matter, world-class science centres and museums, or notable citizen science initiatives.

India has over 1000 universities and more than 500 research institutions but the work

they produce is not only underrepresented in mainstream media but often lacks promotion from the institutions themselves. SciComm, much like research in India, relies heavily on government funding, although there are a few exceptions. This limits its scope and impact.

SciComm also struggles to gain recognition as a professional field, lacking clear job profiles, incentives, dedicated training opportunities, and funding. Due to these challenges, scientists interested in undertaking SciComm and individuals opting for it as a career feel discouraged.

These challenges prompt the question of whether the current state of SciComm in our country is a classic chicken-and-egg problem. To show impact and potential, you need to first allocate adequate resources and support, which the field doesn't seem to be receiving as the impact or value is not apparent. It is also important to recognise that SciComm is a long-haul endeavour that requires sustained commitment and investments to realise its full potential and impact on society. Take the UK for instance. It has been nearly 40 years since the Royal Society released the Bodmer Report (1985), which positively changed the way science engaged with society

and influenced how science and SciComm are funded and evaluated in the UK today.

The absence of dedicated platforms for strategic discussions and research on SciComm to develop resources, benchmarks, and best practices further exacerbates these challenges, limiting the growth of this field.

SCICOMM THINKLABS

To address this lacuna, FAST India launched **SciComm ThinkLabs** in July 2023, which brought together about 16 science communicators and researchers at various career stages and scientific institutions nationwide. Their objective: to collaborate, brainstorm, and devise actionable recommendations and resources to enhance and streamline SciComm in our country. A panel of SciComm ThinkLabs advisers, consisting of SciComm researchers, journalists, and policymakers, provided expert advice and guidance throughout the process. Additionally, the platform facilitated face-to-face discussions during the day-long **SciComm Huddle 2024**, organised a day before FAST India's **India Science Festival 2024** at IISER Pune, to help foster a sense of community and shared problem-solving.



OUR APPROACH

To carry out a preliminary analysis of the state of the sector, four broad themes were identified, given their relevance in the context of India:

- 1) **Landscape of SciComm and PE;**
- 2) **Scope and function of Institutional SciComm and PE;**
- 3) **Capacity Building in SciComm;**
- 4) **Science and Media Connect.**

Subsequently, four Working Groups (WGs) were established, each dedicated to one theme, with guidance from two ThinkLabs advisors. The WG members investigated these themes over a period of 6 months and presented their preliminary findings and

recommendations at the **SciComm Huddle**. The SciComm Huddle brought together 39 participants from the SciComm ThinkLabs and other experts in SciComm and PE, primarily from Indian scientific institutions but also including international SciComm professionals. The Huddle facilitated discussions on the findings and outcomes derived from the ThinkLabs, as well as addressed broader themes within the realm of SciComm and PE in India.

Since this was the first time that many of the ThinkLabs participants were collaborating with each other, as well as across different cities and countries on a research project, guidelines and resources were provided to ensure smooth and efficient teamwork.

REFLECTIONS AND WAY FORWARD

The deliberations during ThinkLabs and at the Huddle highlighted the necessity for a strategic approach to fully leverage SciComm and PE in a country as diverse and complex as ours. To achieve this, we must focus on creating a robust ‘ecosystem for SciComm’ that includes a wide array of actors (Figure 1). These actors must work together synergistically to cultivate a culture of science, engagement, and dialogue. While the components of this ecosystem may be distinct, their collective efforts should produce tangible impacts that are noticeable and beneficial to everyone. For this to happen, it’s crucial to foster a shared understanding and appreciation of the significance, methodologies, and outcomes of SciComm.

The ThinkLabs final report outlines specific initiatives and tools designed to bolster the SciComm ecosystem. Each chapter offers a preliminary overview of SciComm practices, policies and governance, as well as targeted recommendations to address existing gaps and challenges. The working groups have developed essential resources tailored for diverse stakeholders—including the **SciComm Readiness Tool for scientific institutions, a Modular Customisable Framework for SciComm Training Courses, and a Framework for a Science Journalist Residency Program**. These tools and insights serve as a foundation for conducting deeper research and fostering a more engaged and streamlined SciComm ecosystem.

SciComm ThinkLabs benefited greatly from the selfless contributions of science communicators who recognised the critical importance of addressing SciComm challenges at this critical juncture of India’s S&T journey. They felt this was a pivotal moment to reflect on SciComm practices and forge innovative solutions to enhance

public engagement with science and research.

It is crucial to recognise here that although ThinkLabs was facilitated by an organisation, the relevance of its insights and outputs comes from individuals deeply engaged in the SciComm ecosystem and informed by their lived experiences. This underscores the importance of creating and supporting community of practice that generate actionable knowledge and facilitate collective problem-solving. We are also grateful to the other science communicators and engagers who joined us at the SciComm Huddle to provide the much needed thought partnership for this initiative, as well as those who contributed critical feedback at various stages of ThinkLabs.

We hope that SciComm ThinkLabs will serve as a catalyst for productive discussions, collaborations, and advancements in the field, strengthening the essential connection between science, society and policy.

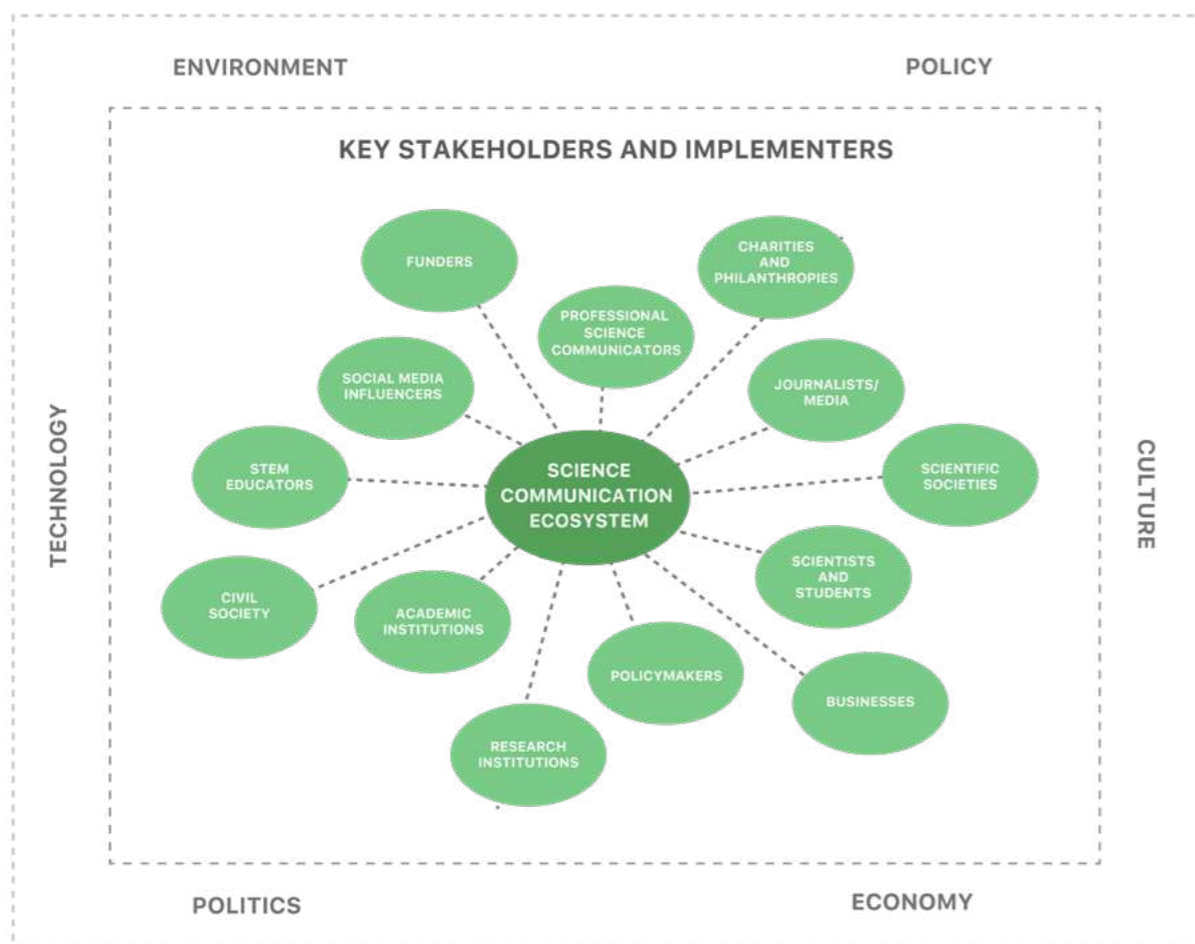


Figure 1: The SciComm ecosystem comprises diverse actors and organisations whose contributions and interactions are shaped by macro factors including culture, economy, politics, and policy. These elements have a collective impact on the dynamics and evolution of the SciComm landscape, as well as how it shapes interactions between science, society, and policy. and their outcomes.



SARAH HYDER IQBAL
Consultant, FAST India
Convenor, SciComm ThinkLabs

¹ Tracing science communication in independent India. Anwesha Chakraborty, Usha Raman and Poojraj Thirumal. 2020. DOI:10.22459/CS.2020.16
² Scientific Social Responsibility (SSR) Guidelines 2022
³ Dhvani – A compilation of resources for science outreach in India. IndiaBioscience. 2023.
⁴ The Public Understand of Science. The Royal Society. 1985
⁵ SciComm Huddle 2024: Bringing India's science communicators' together. IndiaBioscience. 2024
⁶ India Science Festival.

SciComm ThinkLabs Advisors

FAST India and the SciComm ThinkLabs Working Groups are deeply grateful to the advisors for their invaluable support and guidance through this process.



DR ARABINDA MITRA
Hon. Distinguished Fellow & former Scientific Secretary, Office of the Principal Scientific Adviser to the Government of India



BRIAN LIN
Editorial Content Strategy, EurekAlert! at American Association for the Advancement of Science (AAAS), USA



HASAN JAWAID KHAN
Chief Scientist, CSIR-NIScPR, Editor, Science Reporter, India



PROF MARINA JO UBERT
Science communication researcher, The Centre for Research on Evaluation, Science and Technology at Stellenbosch University, South Africa



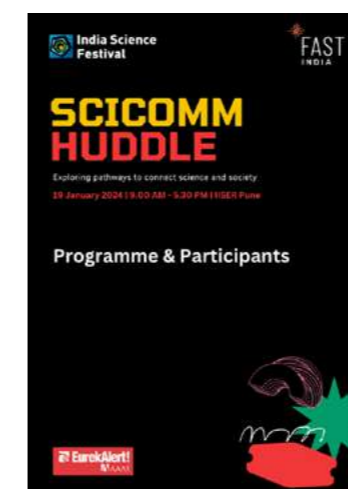
SUBHRA PRIYADARSHINI
Chief Editor, Nature India & Global Supported Projects, Nature Portfolio, India & UK



PROF USHA RAMAN
Professor, Department of Communication, University of Hyderabad, India

SciComm Huddle Participants

FAST India would like to thank the participants of SciComm Huddle who greatly enriched the discussions and recommendations presented by the Working Groups. The day-long SciComm Huddle a day before ISF 2024 facilitated discussions on the findings and outcomes derived from the SciComm ThinkLabs, as well as addressed emerging themes within the fields of SciComm and PE in India and globally.



SCICOMM HUDDLE PROGRAMME AGENDA & PARTICIPANTS

https://bit.ly/scicomm_huddle2024



"Absolutely fantastic one. Some of us have been into SciComm for nearly a decade, and have indeed attended meetings/workshops on SciComm listening to what others are doing. But here, it was more like a collective thinking together to see where we are and perhaps figure out the next steps together. Kudos to the organisers for thinking this through and facilitating this."

SciComm Huddle participant

Working Group 1

Current Landscape of Indian Science Communication Efforts

01

INTRODUCTION

Science Communication (SciComm) and Public Engagement (PE) efforts have been fast gaining traction as a form of practice, a professional career, as well as a field of research across the world, and India has been no exception¹. In the last few decades, SciComm and PE efforts have been increasingly recognised as being critical for communicating with and engaging non-expert audiences on various aspects of science, research, and its applications; informing the direction and pace of technoscientific development; tackling misinformation; and equipping citizens with critical skills for navigating a post-truth world. Consequently, various academic, research, government, policy, citizen-led and funding organisations globally are fast prioritising and investing time, energy, and funds into deploying SciComm and PE as tools for improving the impact of science on society².

In India, particularly, while SciComm and PE efforts have rapidly gained momentum in the past decade or so, several aspects of the practice, research, and teaching of SciComm

and PE remain underdeveloped and exhibit various kinds of lacunae. Examples of such gaps include a deficit in systematic research about such efforts, lukewarm attitudes of researchers and scientists about the need and importance of such efforts, and patchy documentation of the existing diversity of SciComm and PE efforts in the country³. Despite a rich and diverse ensemble of efforts spanning across the boundaries of geography, stakeholders, languages, formats, and approaches to science communication and public engagement in the country, Indian SciComm and PE efforts face several challenges in terms of underdeveloped strategy, benchmarks, evaluation metrics, and reflexivity. Moreover, our knowledge of the history, frameworks, strategies, and best practices in these fields is often directly derived from studies conducted in Global North countries and settings, and translating them into Global South (and specifically Indian) contexts often comes with its own set of challenges and limitations⁴.

Specifically, there are unique intersectional complexities of doing SciComm in Indian contexts given its vast diversity of languages,

"SciComm ThinkLabs has opened up some new ways to understand and respond to the complex demand for better and more diverse approaches to building a more scientifically aware, critical public. This report gives us much to think with, and much to begin acting from--in terms of building networks, creating resources, and nurturing systems of better science communication."

Prof Usha Raman

geographies, ethnicities, and cultural practices. All of these factors necessitate the development of our own specific baselines for strategies, frameworks, guides, and best practices for doing science communication in country⁵.

To address these specific gaps in knowledge and to better document the diversity of Indian science communication efforts, our working group embarked on conducting a landscaping survey of SciComm and PE efforts currently being carried out across the country, along with their specific functions, contexts, and impacts, as well as how well tailored they were for their intended audiences. Systematically collecting and analysing such country-wide data could be really beneficial for not only documenting existing efforts, but also generating more standardised frameworks, strategies and approaches for these fields, and eventually professionalising the field of SC and PE for Indian contexts. We hope to use the data collected to reflect on the current state of SciComm and PE in India and eventually develop actionable roadmaps, frameworks, and recommendations for professionalising and advancing this field in the country. Our ultimate goal is to enable decision makers and policymakers to make evidence-based and informed decisions on how to effectively communicate and engage with the public about science.

OBJECTIVES

As part of the study, we wanted to collect data about the following major verticals or aspects of the Indian SciComm and PE ecosystem:

- Function:** To demarcate the various (often overlapping) aims, objectives, and/or functions of science communication and public engagement in the Indian context.
- Audience’s context:** To gauge the various kinds of audiences as well as the contexts and scenarios within which science commu-

nication is deployed for various Indian audiences, with the intent of better informing the design and implementation of future science engagement efforts.

- Content:** To identify areas, topics and competencies within STEM subjects that different audiences most urgently require communication and engagement in different Indian languages.
- Channels:** To understand the most appropriate channels, formats and languages to use for specific kinds of science communication efforts within specific contexts.
- Assessment:** To measure the impact and adequacy of the existing science communication efforts to help improve current and future endeavours
- Training:** To understand the scope and extent of existing training resources and interventions in the Indian SciComm ecosystem, as well as the gaps and needs for future training opportunities.

METHODS

In order to collect data about the above 6 verticals, we developed a pilot survey⁶ containing a mix of both quantitative and qualitative questions. The survey was circulated through various Indian SciComm and PE networks and was made open to Science Communicators, Scientists, Freelance SciComm Practitioners, Science Journalists, or anyone else who self-identified as a SC/PE practitioner. The pilot survey responses were analysed for preliminary findings and insights discussed below.

FINDINGS

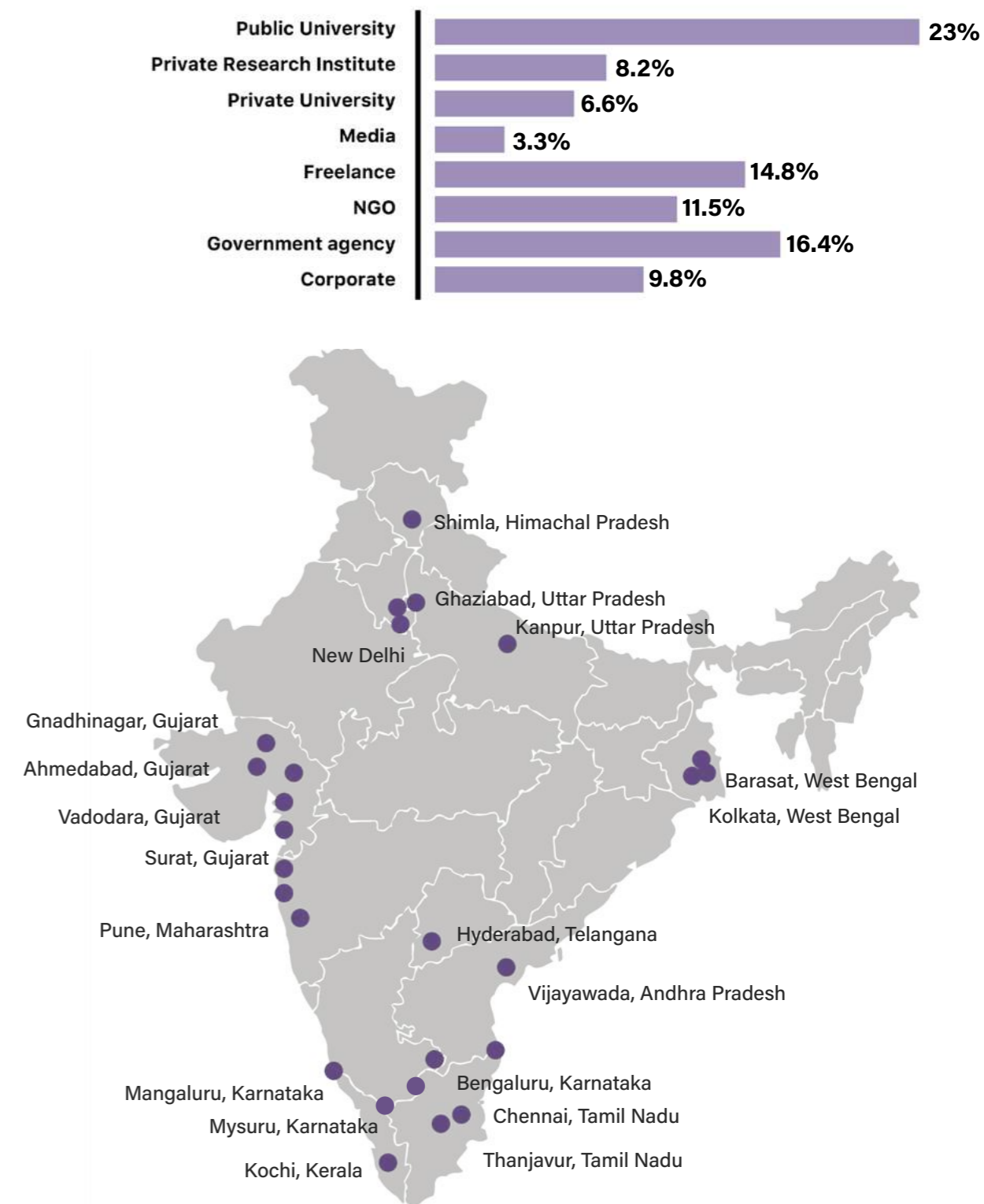
I. Survey Respondents

The first section of the survey was designed to map the constitution of the SciComm and PE community in India. The survey received

61 responses, with the majority of the respondents being in the age groups of 25-34 and 35-44 years and located primarily in the North, South, and West of India. Around 67% of the respondents self-identified themselves as SciComm and PE practitioners

(with 26% sometimes identifying as SciComm and PE practitioners and 7% not being sure). It was interesting to note that comparable percentages of the respondents took up SciComm and PE as their primary work and tertiary/secondary work (39% primary work,

FIGURE 1 : DISTRIBUTION OF SURVEY RESPONDENTS



38% secondary or tertiary work). Among the respondents of the survey, 23% work at public universities, 16% at government agencies, and 12% at NGOs, 10% at corporations, 8% at private research institutes, and 7% at private universities. Around 15% work as freelancers.

More than half of the respondents (54%) had no formal training in SciComm and PE and had mostly learnt on the job. Only 16% of the respondents had formal training. The time spent per week doing SciComm and PE showed an almost proportionate distribution in the range of 2 to 40 hours, with 70% of respondents wishing to spend more time doing SciComm.

II. Functions of SciComm and Public Engagement

The second section of the survey explored the various (often overlapping) aims, objectives, and/or functions of SciComm and PE in the Indian context. Questions were included to elucidate a snapshot of the functions currently fulfilled by the SciComm roles undertaken by the respondents and the functions that they think SciComm should fulfil. Spreading awareness about STEM, making STEM more enjoyable/accessible and scientific literacy received the highest responses for what is currently being fulfilled.

Countering misinformation, facilitating behavioural change via evidence and questioning science actors are functions that respondents indicated they would like SciComm to fulfil more (Figure 3).

The respondents identified a **lack of training, funding, and clear institutional policies with reduced priority for SciComm and PE** work as the major barriers to SciComm in India. Although the finding is in line with the findings of a previously published survey of biomedical and health researchers in India, a large-scale, wider survey would be necessary to conclusively recommend interventions/policies based on these findings.

III. Audience of SciComm and Public Engagement

A section of the survey had questions to gauge the various kinds of audiences as well as the contexts and scenarios within which science communication is deployed for various Indian audiences. Around 36% of respondents felt the level of public understanding of STEM issues in India was moderate, 39% felt it was low, and 21% felt it was very low. The top 5 target audiences that the respondents worked with include University students, School students, Researchers, Citizens, and Teachers.

IV. Content of SciComm and Public Engagement Initiatives

This section of the survey aims to investigate the topics and disciplines that the respondents covered in their work and the interests of their audiences (represented on page 19). Additionally, it examines

the sources and aspects of science that they used in their science communication activities. In terms of content, the top five domains were new research publications, experiences of people involved in science, the positive societal impact of science, the process of doing science/research, and technological advancements.

FIGURE 3 : FUNCTIONS OF SCICOMM IN INDIA

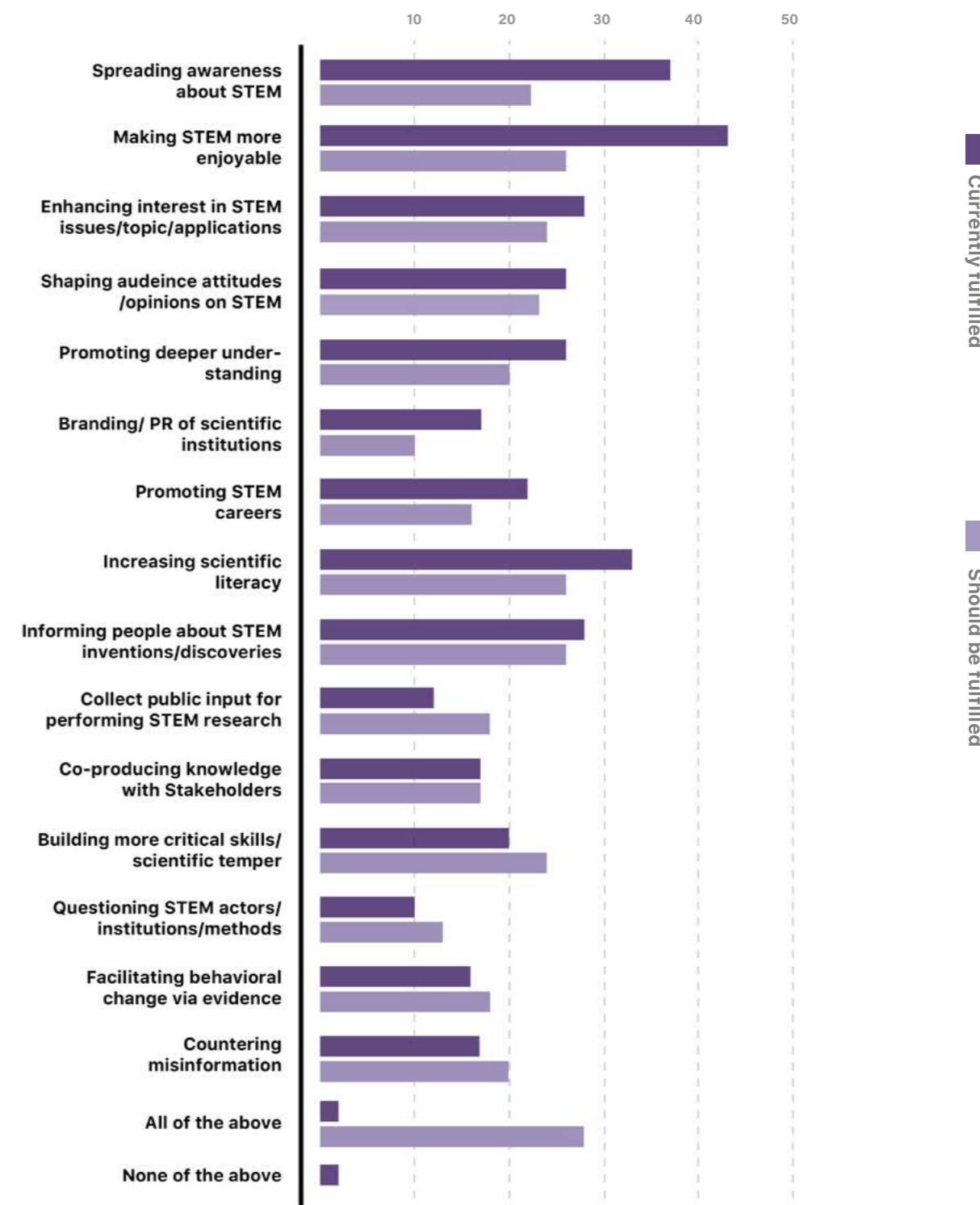


FIGURE 2 : IN WHAT CAPACITY DO PARTICIPANTS PERFORM SCICOMM/PE

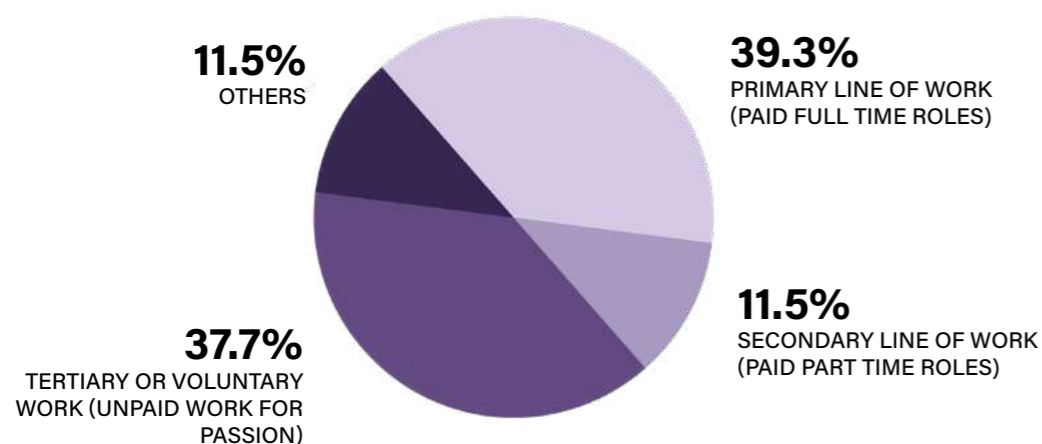


FIGURE 4 : BARRIERS IN SCICOMM/PE

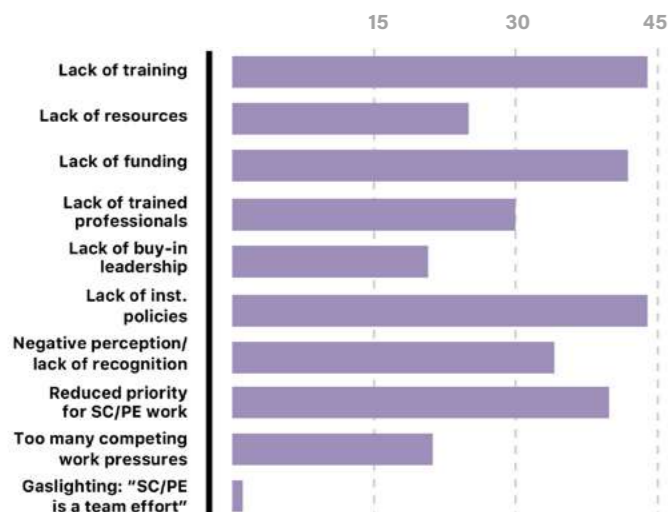


FIGURE 5 : WHAT IS THE LEVEL OF UNDERSTANDING OF STEM ISSUES IN INDIA?

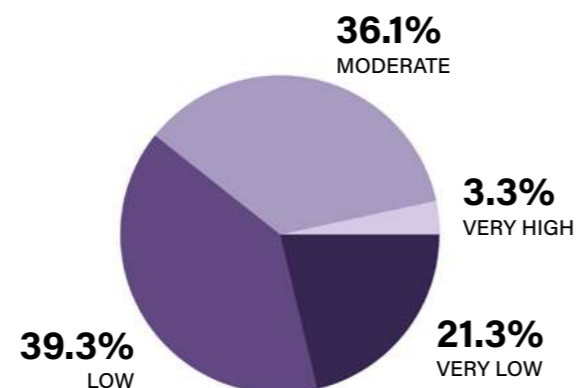


FIGURE 6 : SCICOMM/PE TARGET AUDIENCES

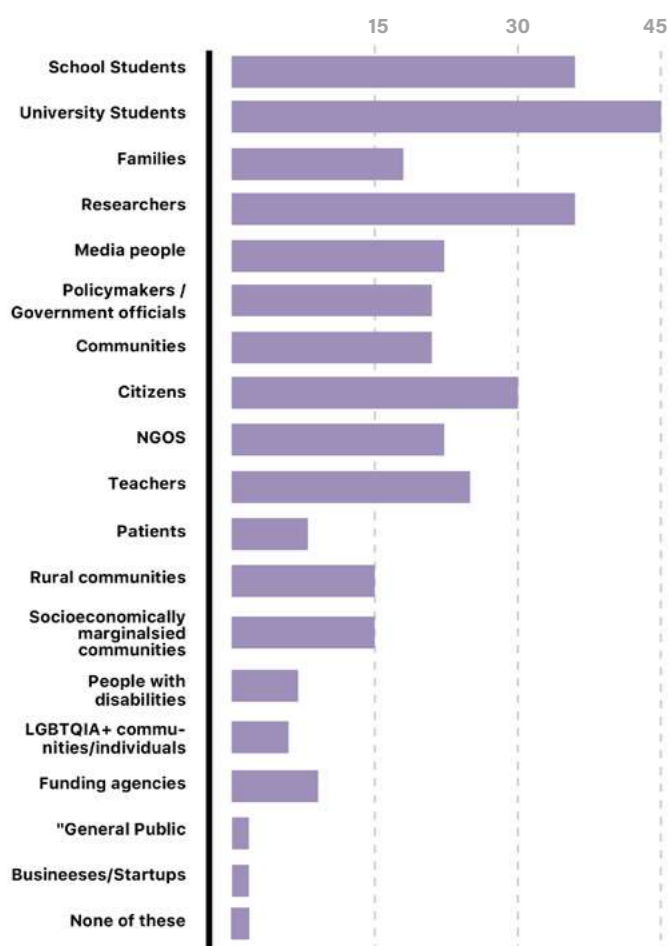
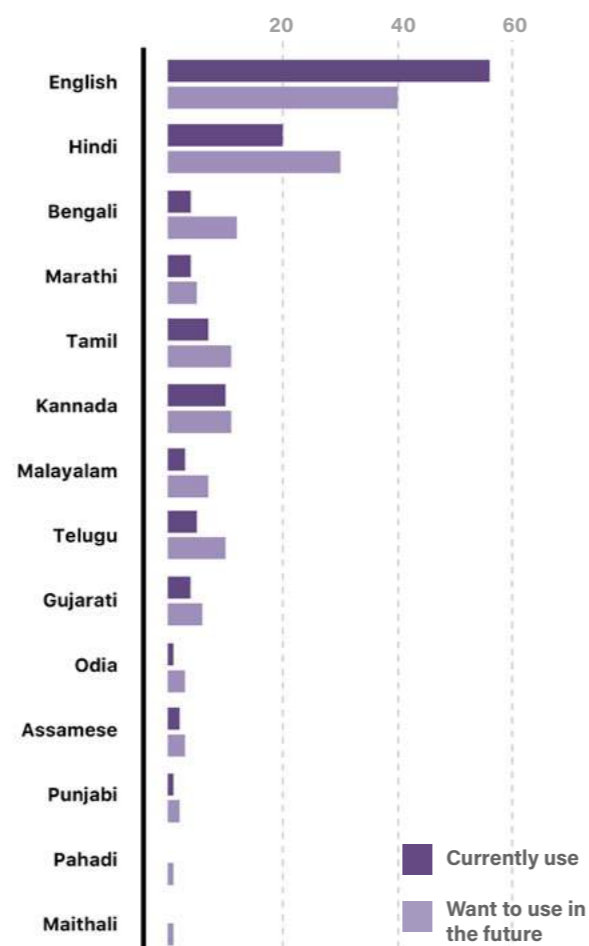


FIGURE 7 : LANGUAGES USED FOR SCICOMM/PE



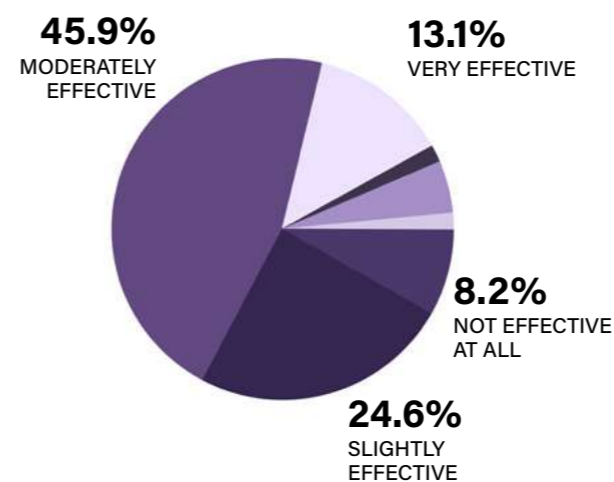
V. Channels of SciComm and Public Engagement

To effectively communicate science, it's important to consider the context, target audience, and appropriate channels, formats, and languages to use. Popular science writing stood out as the format most used by respondents to the survey, followed by social media/digital platforms, and scientific illustrations/infographics/comics. 95% of the respondents currently use English but many want to communicate more in Indian languages going forward. The visual mapping shows the languages currently used by the respondents versus the languages they want to use more for their SciComm activities in the future. The majority of respondents rely on practitioner insights followed by research papers in terms of research or evidence-based insights in SciComm/PE or allied areas, according to the survey.

VI. Assessment of SciComm and Public Engagement

According to the survey, 46% of respondents feel their SciComm activities are moderately effective. However, a majority have never used any assessment tools for their

FIGURE 8 : HOW IMPACTFUL DO YOU THINK CURRENT SCICOMM/PE ACTIVITIES HAVE BEEN?



activities. A majority of respondents, nearly 75%, expressed a desire for more formal training and opportunities to learn about evaluation and impact measurement for their SciComm/PE activities.

VII. Training in SciComm and Public Engagement

74% of respondents believe that professional training in SciComm and PE can improve their ability to carry out current and future responsibilities. Digital content creation, science writing, and monitoring and evaluation of SciComm practices emerged as the top three areas for training.

RECOMMENDATIONS

We conducted this pilot survey to derive preliminary insights into the current state of the Indian SciComm ecosystem. At the outset, although the current study is a snapshot, it serves as a baseline, capturing the key aspects related to the state of SciComm in India. Since such a systematic effort was carried out for the first time, it does provide insight into the various aspects gathered through the survey. Given this was an initial effort, the sampling size may be limited to spell out the findings conclusively. Hence, it may be critical to undertake a broader survey, gathering responses from a larger number of respondents representing various groups. Despite the limited sampling size, the pilot survey has some useful takeaways. The broad takeaways from the findings of the pilot are:

I. Training and Capacity Building

The preliminary findings from the survey indicate that training and capacity building in SciComm and PE are critical to professionalising and furthering the field in India. Considering that more than half of the survey respondents had no formal training and had mostly learnt on the job, a considerable

section of the respondents (74%) believed that professional training could improve their ability to engage in SciComm and PE activities. This points to a need to develop and introduce courses on SciComm and PE in the education system of the country.

II. Diversifying Practice of Science Communication

The pilot revealed that the majority of the respondents had worked in English and also wanted to continue working in English, perhaps also limited by the sampling size. English and Hindi seemed to be the two major languages used for SciComm and PE in India, which again could be due to the limited reach of the survey (limited sampling size). Further, popular science writing stood out as the most used means of communicating science. If SciComm has to work for the public in India, there is a need to diversify the practice, taking into account the diversity in language, beliefs, and cultural practices.

Furthermore, it is important to recognise that traditional science communication often relies on an "information deficit model." However, there's a growing need to shift towards a dialogue-based approach, fostering inclusive conversations among stakeholders. This aligns with the idea put forth by Nisbet and Scheufele, advocating for a move away from top-down communication towards engaging discussions that embrace diverse knowledge, values, perspectives, and goals.

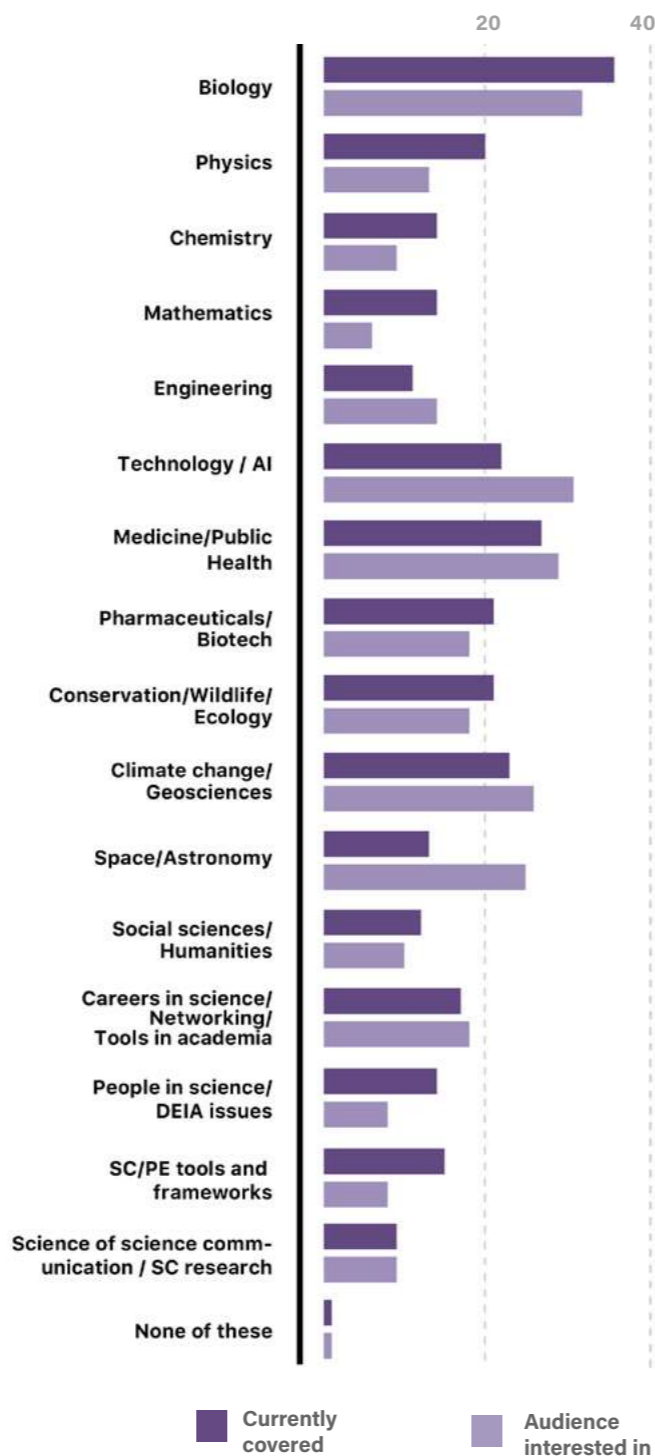
We understand that such diverse practices and initiatives could already be happening in different parts of India that the survey has not been able to capture because of its limited reach in the pilot phase.

III. Measuring Impact

On one hand, the majority of the respondents had never used any assessment tools for their SciComm activities and on the other, the majority felt their initiatives to

be effective. This mismatch highlights the importance of streamlining the process of doing SciComm with a shared understanding of global best practices. Not surprisingly, nearly 75%, expressed a desire for more formal training and opportunities to learn about evaluation and impact measurement for their SciComm/PE activities.

FIGURE 9 : TOPICS COVERED WITHIN INDIAN SCICOMM/PE



CONCLUSIONS

In our study, we aimed to document the diverse practices and map the community along with its needs, challenges, and aspirations. However, we understand that the perspectives shared by a small subset of Indian SciComm and PE practitioners might not be representative of the entire community. Therefore, building recommendations solely based on these findings could be misleading.

As our next step, we plan to expand the reach of the survey to obtain data that represents all subsets and sectors involved in SciComm/PE activities in India. We believe that while the overall philosophy, purpose, and practice of SciComm and PE should be in line with global standards, the framework and roadmap to professionalise the field should be designed and implemented in a way that addresses critical gaps and issues specific to India.

Acknowledgements:

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Landscaping Survey Questionnaire to Assess Indian SciComm Efforts

https://bit.ly/WG1_Survey



SUDHIRA H.S.
Director, Gubbi Labs, Bengaluru



BANYA KAR
Public Relations, Outreach, National Institute of Immunology, New Delhi



SIDDHARTH KANKARIA
Communications & Program Coordinator, NCBS, Bengaluru



JANET ORLENE
Science Communicator (Independent), Bengaluru



PRIYAMVADA CHUGH
Senior Communications Manager, India Health Fund, Mumbai



PARAMANANDA BARMAN
Scientist, CSIR-NIScPR, New Delhi

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Working Group 2

Finding a Place for Science Communication at Indian Institutions

02

INTRODUCTION

SciComm refers to a wide range of activities that help connect science with various stakeholders in society. In institutional settings such as research organisations and universities, SciComm serves both utilitarian and social responsibility goals for the scientists and the institutions.

The utilitarian roles involve being accountable for research developments or being visible among the scientific community and funders, highlighting the different focus areas of the organisation and attracting the best talents to study and work. The social responsibility roles entail opening up the avenues of science at personal and professional levels for diverse kinds of citizens to participate in S&T development and helping them understand the world better by demystifying the scientific process and resulting knowledge. Both sets of goals help scientific institutions and scientists gain trust among their benefactors and beneficiaries and visibility for more active collaborations, technology transfer, and shaping science-driven policies.

The stakeholders in institutional SciComm are diverse, ranging from those funding

the research to those using the resulting research products or those wanting to pursue science educationally and professionally. These stakeholders have varied training, involvement, and investment in S&T research and development. The common stakeholders that scientific organisations need to stay connected with are their funders, the scientific community, industry, citizens, and young people.

SciComm in India has been traditionally carried out by scientists themselves to instill scientific thinking as well as an interest in STEM careers. Institutions have only recently begun hiring professionals for SciComm. These SciComm efforts, however, are limited to a few stakeholders and audiences; there are few resources for experimenting with different modes and formats of communication, and SciComm is generally done in a reactive rather than strategic manner.

While organisations like FAST India¹ have developed resources to enable institutions to better understand the requirements of the institutional SciComm function, a more systematic approach is needed to embed SciComm at scientific institutions in our country.

"Initiatives like SciComm ThinkLabs and the SciComm Huddle during the India Science Festival are crucial to the development and sustainability of science communication efforts for a country like India, where an enormous amount of science is taking place that the world wants - and needs to know about. I was tremendously inspired by the hardworking, talented, and passionate science communicators I encountered during my participation in these initiatives and look forward to witnessing these seeds grow and blossom."

Brian Lin

OBJECTIVES

Our working group aimed to understand the current state of SciComm at academic and research institutions across the country in order to develop recommendations and resources to assist science communicators, institutional leadership, funders, and other decision-makers in better understanding the roles, scope, and requirements of institutional SciComm in order to make more informed decisions about establishing science communication capabilities in scientific institutions in India.

METHODS

This working group developed the recommendations in this report based on their own professional experience working as institutional science communicators in well-established science organisations in India.

The group also consulted with professionals in the USA and Canada and reached out to other professionals in India through two surveys done by FAST India's SciComm ThinkLabs (see Working Group 1 and 4 surveys) to both widen and deepen their understanding of the field. They also derived from the findings of a paper from DST-Centre for Policy Research at IISc, Bengaluru, and existing literature from FAST India.

FINDINGS

I. How does SciComm operate in the Indian institutional ecosystem?

The DST-CPR 2022³ report and our own observations tell us that scientific institutions working in natural sciences, engineering and technology, medical and health sciences, environmental sciences, agriculture, and forestry funded by the Department of Science and Technology (DST), Department of Biotechnology (DBT), Department of Atomic Energy (DAE), Council of Scientific & Industrial Research (CSIR), Department of Space (DoS) and Ministry of Education (MoE)⁴ have officially appointed employees with the roles of SciComm, public outreach, or public relations. These roles are shaped primarily by the priorities of their organisations and the overarching mandate of the Government of India and the Ministry of Science and Technology. In addition, the aforementioned funding bodies and ministries have also appointed science communicators (though we have not been able to reach them through our surveys). These appointments are done as associates, coordinators, scientific/technical officers, and SciComm head positions. In some places, the role of SciComm has been added to the portfolio of existing staff members.

The Indian scientific institutions can be broadly divided into two categories:

i) **universities**, IISc, IITs and IISERs, where teaching undergraduate students is a core

responsibility and they research on a wide variety of topics; and

ii) **research institutes**, many of which work on thematic areas and engage PhD students and scientists.

So, generally, the former category of organisations focuses a great deal on attracting a large number of students and staff across academic levels, while the latter's focus is on a much narrower set of students who are looking to do their PhDs. Also, the number of departments and researchers in the former category is much larger than the latter. These differences shape hiring decisions for SciComm in these organisations.

Institutions with an undergraduate education focus require a larger team of people to work together than smaller organisations. There are examples of a multi-person team in the Communications Office at IISc or multiple offices looking at 'Research Communication' and 'Science Education' at IISER Pune. But lack of resources in most other cases has meant

that they have stayed limited to appointing only a Public Relations Officer, if at all (see the table for the definition of these terms).

On the contrary, research institutes hire 1-2 people who take care of a much broader range of responsibilities. Our survey captured many of these science communicators in research institute settings and found that they are responsible for outreach event organisation, writing research news and covering social media handles and website content management, conducting educational training programmes, and teaching SciComm to others in their institutes.

In addition to these roles, many science communicators have shared that they have to also deliver roles that are meant for Academic Cell, Planning, Monitoring and Evaluation Cell, Research and Grants Office, or Business Development Office. These expectations do not leave them with much time and resources to work on their supposed primary role of SciComm.



Figure 1: Adapted from Public Engagement with Research (PER) Daisy developed by Oxford University, UK, shows various overlapping aspects and objectives of the University's communications and engagement activities. ²



'SCIENCE COMMUNICATION' TERMS COMMONLY USED AT SCIENTIFIC INSTITUTIONS

SCIENCE COMMUNICATION

The process of communicating scientific knowledge and concepts to various audiences in a clear, accessible, and engaging manner, often through different media channels such as written articles, presentations, outreach activities, or digital content. It is an all encompassing term that includes the terms mentioned here.

RESEARCH COMMUNICATION

Specifically focuses on disseminating the findings and outcomes of research projects to relevant stakeholders, including other researchers, policymakers, industry professionals, and the public, through write-ups, publications, conferences, and other media formats and platforms.

ACADEMIC COMMUNICATION

Specifically aims to increase the impact of research and education initiatives of the institution. The primary focus is on strengthening ties between the research, business, and outreach offices to facilitate fundraising and partnership-building activities. Additionally, this function entails supervising research communication and public engagement activities.

SCIENCE EDUCATION

The formal and informal processes of teaching and learning about scientific principles, theories, and methodologies, typically occur in academic settings (such as schools, colleges, and universities) as well as through informal education programmes in academic/research institutions, museums, science centres, and outreach activities.

SCIENCE OUTREACH

Initiatives aimed at connecting scientists and scientific institutions with the broader community, often targeting specific demographics or communities, foster interest in science, promote understanding, and inspire curiosity through activities like workshops, public lectures, or hands-on demonstrations.

PUBLIC ENGAGEMENT

Involves actively involving members of the public in scientific endeavours, seeking their input, feedback, or collaboration in research projects, policy-making processes, or other activities, with the goal of fostering dialogue, mutual understanding, and shared decision-making.

PUBLIC RELATIONS

The strategic communication efforts of an organisation, including scientific institutions, are aimed at managing and shaping its public image, reputation, and relationships with various stakeholders, which may include the media, government agencies, funding bodies, industry partners, and the general public. In scientific institutions, PR activities often involve highlighting achievements, promoting initiatives, and managing crisis communications.

II. Structuring SciComm in Indian Institutions

Through discussions with experienced SciComm professionals in North American institutional settings, we discovered that Indian institutions hold a distinctive position. The variations don't solely stem from the delayed establishment of formal SciComm offices in Indian institutions, but are also deeply tied to the historical development of SciComm in India. Institutions in India that have embraced SciComm have done so with the aim of dispelling superstitions by rendering scientific evidence comprehensible and nurturing a scientific mindset among younger generations. This initiative has been largely propelled by the leadership within these institutions, contributing significantly to embedding this ethos into their respective institutional cultures.

This objective of SciComm still prevails in Indian institutions and among Indian scientists when they invest in SciComm and has been augmented now by newer institutional objectives of increased visibility to attract talent, funds, and collaborations. This has meant that the institutions now work with a variety of stakeholders. Our survey

with the science communicators showed that students, educators, journalists, and the general public are the top stakeholders they work with, using multiple formats of content requiring skills in writing and audio-visual making for people with different levels of understanding of science.

More mature institutions have team members among whom the responsibilities of education, press communications, multimedia content creation, brand building, and outreach are distributed. Most Indian institutions are far away from such a scenario. Hence, we have brought together examples from some of the Indian institutions on how they have worked around their teething challenges of institutional SciComm:

a) Forming teams

Institutions with undergraduate students like Ashoka University and IIT Gandhinagar have separate personnel for communication, brand building, and SciComm. Incorporating SciComm into their communications work helps them explain the scientific research to their funders. For example, at Ashoka University, the SciComm staff benefits from a dedicated institutional media team skilled in brand building, public relations, and communications. Collaborating closely, they offer strategic insights, digital and social media support, and media relations to the SciComm staff. Additionally, the SciComm staff collaborates with the institution's outreach team, which engages prospective students and parents, in effectively communicating diverse research to this audience. With robust support from media, outreach, and development teams, SciComm function extends to fundraising, partnership building, and talent recruitment, ensuring broad engagement. This division of labour optimises efficiency, streamlines processes, and fosters collaboration, allowing the SciComm staff to focus on core duties while specialised public relations and logistical support provided by other teams.

b) Making SciComm an institutional activity

Research institutions such as TIFR-Hyderabad and CSIR-CCMB have hired permanent staff members to lead the SciComm initiatives. This helps keep the activities continuous and the goals longer-term, despite changes in institutional leadership. It allows the possibility of growing a diversified team with the necessary skills as needed by the organisation. They also train the PhD students in basic SciComm as part of their PhD training credits, involve students and scientists in their different SciComm activities and avail help from institutional departments such as IT and housekeeping for organising different events. This helps in co-designing programmes with the scientists and prevents the SciComm team from working in silos with the other members of the organisation.

c) SciComm for more than individual goals

The astronomy community of India has exemplified how different institutes have come together to work towards a common goal of making astronomy exciting and available to the public. Not only within academic spaces, they have worked with and inspired many museums, planetariums, and space educational initiatives.

d) Funding for SciComm

Most public or private scientific institutions fund their communication activities, including SciComm, through their core funds. But there are external funds available for SciComm, education, and public engagement that science communicators and scientists can apply for. In India, such grants are given by DST (up to ~ INR 80 lakhs/grant through NCSTC), IndiaBioscience (up to INR 1 lakh/grant), and DBT/Wellcome Trust India Alliance (up to INR 15 lakhs/grant). CSIR also provides grants to its institutes to support school-centered SciComm and education programmes under its Jigyasa programme (has allotted INR 98 cr

among all its research institutes from 2021-26). Furthermore, international and CSR funds are yet to be fully explored and tapped in India.

RECOMMENDATIONS

Based on this brief study, it is clear that scientific institutions in India are at various stages of recognising and developing their SciComm capabilities. To enable this process of evolution, our group has developed the **SciComm Readiness Tool** to help institutions assess their current commitment and capacity for SciComm/PE. The tool also indicates measures the institutions can take to improve their ability in SciComm/PE in line with the growing demands and trends in science. Funders can also use the tool to review an institution's commitment and capability to engage the public with science.

Scientific institutions play a critical role in establishing and maintaining a robust SciComm ecosystem. We recommend that institutions be evaluated and incentivised on a regular basis for their SciComm initiatives, and that funders actively support the implementation of impactful SciComm activities. Institutions, particularly public-funded institutions, should not only allocate adequate funds for SciComm but also create mechanisms to allow SciComm staff to raise funds externally through grants similar to research. Finally, institutions should also clearly distinguish between 'SciComm' and 'PR' in order to hire more effectively and communicate science rigorously and timely.

CONCLUSION

SciComm is a useful tool for scientific institutions to promote scientific knowledge and research. It not only helps highlight the work done by the scientists but also helps initiate dialogue with the stakeholders of S&T, ranging from the funders to the users, like the public. But to achieve these goals, it

is important to use SciComm proactively and strategically. This requires the leadership to set institutional goals and SciComm goals in alignment with them. And depending on how their goals mature, the institution should focus on growing their capabilities by means of training or specialised hirings.

We hope that the examples provided in this report, as well as the checklists, will be useful for Indian academic and research institutions seeking to hire science communicators in terms of job expectations, the necessary skills, and the environment required to foster a sustainable new vertical in their organisation. We also hope that organisations that have already implemented SciComm will be inspired to align it with their core institutional goals. While creating content is only the first step, SciComm's ultimate goal is to make science more accessible to stakeholders in order to encourage dialogue and collaboration in scientific pursuits.

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¹ FAQs: Building a Communications team at Scientific Institutions in India. FAST India. 2023

² Working paper: Public Communication by Scientific Institutions in India: A Case for Change. FAST India. 2022

³ Mapping & Understanding the practice of SciComm & Outreach Activities (SC&OA) undertaken by R&D institutions in India. Fahmida Khan. DST-CPR, Bengaluru. 2022

⁴ Mapping the S&T Ecosystem at the Central Government Level in India: Key Ministries. FAST India. 2023



SciComm Readiness Tools for Scientific Institutions

https://bit.ly/scicomm_readiness_tool



SOMDATTA KARAK
Science Communication and Public Outreach Officer, CCMB, Hyderabad



YUKTI ARORA
Senior Manager, Academic Communications, Ashoka University, Sonapat



BANYA KAR
Public Relations, SciComm & Outreach, National Institute of Immunology, New Delhi



ANUSHEELA CHATTERJEE
Programme Head, Science Media Centre – TIFR, Hyderabad



VARUNI P
Outreach Associate, The Institute of Mathematical Sciences, Chennai



NIRUJ MOHAN RAMANUJAM
Head of SCOPE Section, Indian Institute of Astrophysics, Bengaluru



SHRIYA NAIDU
Program Associate, FAST India



"I have been impressed and inspired by the passion for advancing science communication in India, visible amongst the professionals who have initiated and organised the "SciComm ThinkLabs" since its launch. In a short period, they have made considerable progress toward their goals of 'actionable roadmaps, frameworks, and recommendations to professionalise and advance the field in India'. Seeing how they have communicated and shared progress in formats that allow others to benefit from the work is incredibly encouraging. As outlined in this report, the working groups' activities provide a solid basis for further research and evidence-based practice when tackling contemporary challenges in the relationship between science and society, including science PR, societal trust in science, inclusion and more! I also see tremendous value and potential in the network of science communicators they have created. Networks of science communicators in other countries could benefit hugely from following this example."

Dr Marina Joubert

Working Group 3

Elevating Indian Science Communication Through Training

03

INTRODUCTION

Science Communication and Public Engagement (SciComm/PE) in India is being rapidly shaped by emerging trends in science, technology, education, and communication, prompting academic and research-performing institutions to develop and nurture a cadre of professionals trained to effectively communicate science. With key STI policies recognising the importance of strengthening the science-society link, capacity building in science communication and public engagement emerged as critical for both institutions (government and non-government) and individuals (at various career levels) (Figure 1).

Effective SciComm/PE is crucial as it promotes scientific literacy, enhances public trust in science and scientists, facilitates dialogue and collaboration between scientists, policymakers, and the public, and plays an important role in inspiring the next generation of scientists while fostering a culture of curiosity and inquiry^{3,4}. The community of SciComm/PE practitioners and researchers in India and globally comprises professionals who have undergone either formal or informal or both kinds of training,

with practitioners in India increasingly recognising the value of formal training. The profession, like any other, requires one to undergo training for career growth and specialisations to effectively communicate science or engage with a larger society. With this in mind, capacity building in SciComm/PE was acknowledged as one of the key areas of investigation for SciComm ThinkLabs.

FIGURE 1 : TOP 10 FUNCTIONAL COMPETENCIES

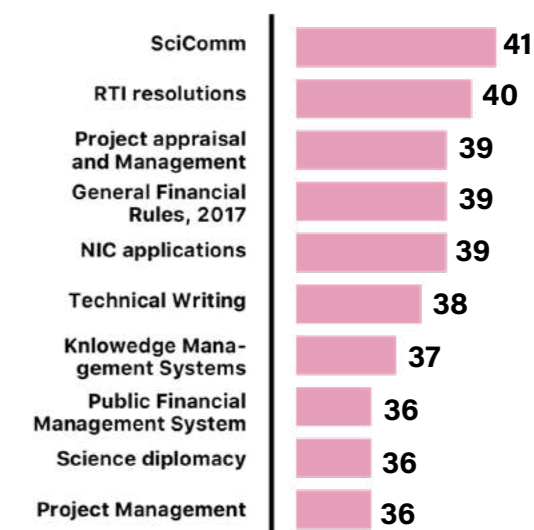


Figure 1: Science Communication emerged as the top functional competency during a Competency Needs Analysis survey for officials of the Department of Biotechnology, Ministry of Science and Technology, Government of India².

Internationally, there has been a growing recognition of the importance of SciComm education and training. Academic institutions, associations of SciComm practitioners, and other government and non-government bodies from across the world have taken cognizance of this and developed and anchored degree programmes and short-term courses to meet local needs. Institutions in different countries have developed degree programmes, workshops, and professional development initiatives to cultivate a skilled workforce of science communicators.

In the United States, the **Alan Alda Centre for Communicating Science** offers graduate-level courses and workshops designed to equip scientists with skills to foster interdisciplinary partnerships, attract funds for research and inspire the next generation of researchers⁵. The Science Communication Unit at the University of the West of England in the United Kingdom offers a postgraduate programme in science communication, focusing on building a theoretical foundation, specialisation in skills based on current needs and practical assignments⁶. The University of Edinburgh offers a postgraduate course that offers practical exposure through seminars, small-group activities, and practice-based sessions, culminating in a final semester

choice of research or practice-based project⁷.

In addition to academic programs, there are numerous professional associations and networks dedicated to advancing science communication worldwide. These include organisations like the **National Association of Science Writers (NASW)** in the United States, the **Australian Science Communicators (ASC)**, and the **European Science Communication Network (ESConet)**, among others. Some discussion forums provided deeper insights into the global trends in SciComm/PE training.

The **Public Communication of Science and Technology (PCST)** conferences have provided a powerful platform for practitioners of SciComm/PE and training in these areas has been a common thread in these discussions. The topics ranged from course structure to the importance of developing specific competencies and skills, reflections on best practices and adaptation to the changing needs of the world⁸.

During 2020-2021, **Factory Wisskomm**⁹ in Germany collaborated with the country's Federal Ministry of Education and Research, universities, and research organisations. Their deliberations indicated that SciComm training priorities differed across undergraduate, postgraduate, and scientific levels. Notably, professional communicators within scientific institutions were identified as potential educators or coordinators for such programs.

The **Quality and Effectiveness in Science and Technology Communication (QUEST)** project¹⁰ funded by the European Union under **Horizon 2020**, created the QUEST tool to evaluate science communication and more recently, its efficacy was assessed as a training tool in a PhD program¹¹. The study found that while the model aided students in analysing their communication activities in retrospect, it was not utilised effectively during the planning stages of a communication

task. The authors argued for the tool's applicability at other levels of training.

A large-scale survey by project **RETHINK**¹² engaged 459 science communicators from seven countries in Europe to redefine competence development in science communication. Participants, primarily from STEM backgrounds, and a few of them with degrees in journalism or science communication, highlighted a lack of formal training among participants. Visual communication, video/podcast production, storytelling, public engagement, media training, and social media outreach were crucial.

These deliberations have provided resources, training opportunities, and forums to facilitate collaboration and knowledge exchange among science communicators about SciComm/PE training alongside other focus areas. However, there remains a need for SciComm/PE training that is responsive to the realities and needs of Indian students, researchers, and practitioners.

OBJECTIVES

The SciComm ThinkLabs Working Group 3 aimed to landscape SciComm/PE training in India and identify the current gaps and opportunities. As part of our work, we discussed the rationale, methods, and objectives of such training programmes, identified commonalities and differences, and, based on the findings, developed a broader framework for SciComm/PE training in India. We believe that a broader and more scalable framework can be adapted by scientific institutions with diverse training needs (learning goals and outcomes, training duration, etc.).

This report presents information on existing programmes, resources, and initiatives, as well as a survey's findings on strengths, challenges, and opportunities in the field. Furthermore, a modular version of the framework is appended

to serve as a guiding blueprint for enhancing training in science communication across the country by different science agencies.

METHODS

Our working group conducted a landscaping study over six months that covered (i) an examination of academic and research institutions' websites offering SciComm and related courses globally and nationally, (ii) a review of recently concluded or ongoing global SciComm projects that focus on SciComm training; (iii) a survey involving 59 science communicators (as of January 5, 2024); and (iv) email interviews with trainers of SciComm/PE courses in India (see Survey link).

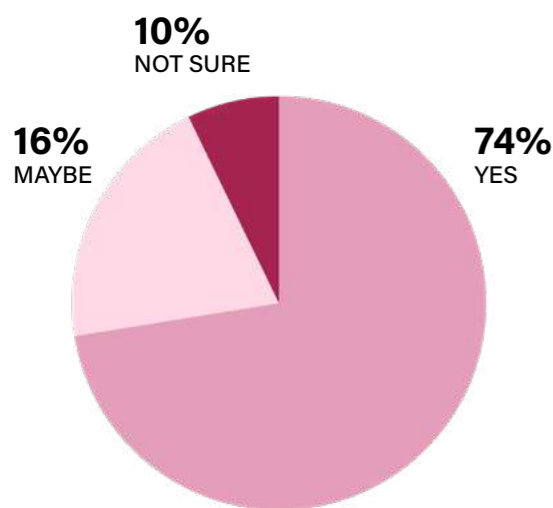
FINDINGS

A multifaceted approach provided insights into the landscape of SciComm/PE training, aiding in the formulation of informed recommendations for enhancing these initiatives in India.

I. Landscaping SciComm training in India^{13,14}

It is evident from mapping the landscape of SciComm/PE training in India that the majority of programs receive support from the government, with universities offering degree programmes and research institutes providing shorter courses (*Table 1*). The content of these programmes emphasises practical skills, including journalism focused on science, environment, health, and agriculture. The duration and fees vary widely, ranging from very short courses to multi-year degree programmes, with most courses requiring payment. Trainers typically come from backgrounds in journalism or mass communication, supplemented by practitioners in SciComm. The student demographic spans undergraduate to postgraduate (including doctoral) levels, as well as early-career researchers

FIGURE 2 : DOES PROFESSIONAL TRAINING HELP?



ORGANISER	CONTENT/THEME OF SCICOMM TRAINING	TRAINERS	BENEFICIARIES	DURATION	YEAR OF LAST EVENT
Government(21)	<ul style="list-style-type: none"> • Science writing (popular) in English and regional languages (technical and popular) • Fundraising • Science Journalism • Oral Presentations at conferences and seminars • Digital Media 	<ul style="list-style-type: none"> • Scientists and SciComm experts, Science journalists 	<ul style="list-style-type: none"> • Scientists (especially early career researchers) • Other researchers • UG and PG students of STEM and non-STEM courses • SciComm professionals • Media professionals 	1 day Training program to 1 year Certification course	2021
Non-Government(6)	<ul style="list-style-type: none"> • Science writing (popular) • Science Journalism • Oral and Written communication 	<ul style="list-style-type: none"> • SciComm experts, Science journalists 	<ul style="list-style-type: none"> • Early Career Researchers • UG and PG students of STEM and non-STEM courses 	1 day Training program - 4 month course	2023

Table 1: An overview of SciComm/PE training programs in India showing the source of funding (government and non-government), course content, trainers, students, duration of courses, and the year the last edition of the course was held. Data compiled from the GlobalSCAPE database (Asia).

and journalists/practitioners in SciComm/PE. A deeper look at SciComm/PE training initiatives at research and non-research organisations showcases diverse offerings. For instance, the CSIR - Centre for Cellular & Molecular Biology, Hyderabad, offers a credit course on popular science communication for PhD students, while the DBT/Wellcome Trust India Alliance organised workshops integrating science communication and public engagement modules. The Government of India's Capacity Building Commission (CBC) organized workshops tailored for scientists, science administrators, and managers, while non-governmental entities like CACTUS Communications Pvt. Ltd. continue to conduct workshops targeting students and early-career researchers at academic and research institutions.

II. Professional roles

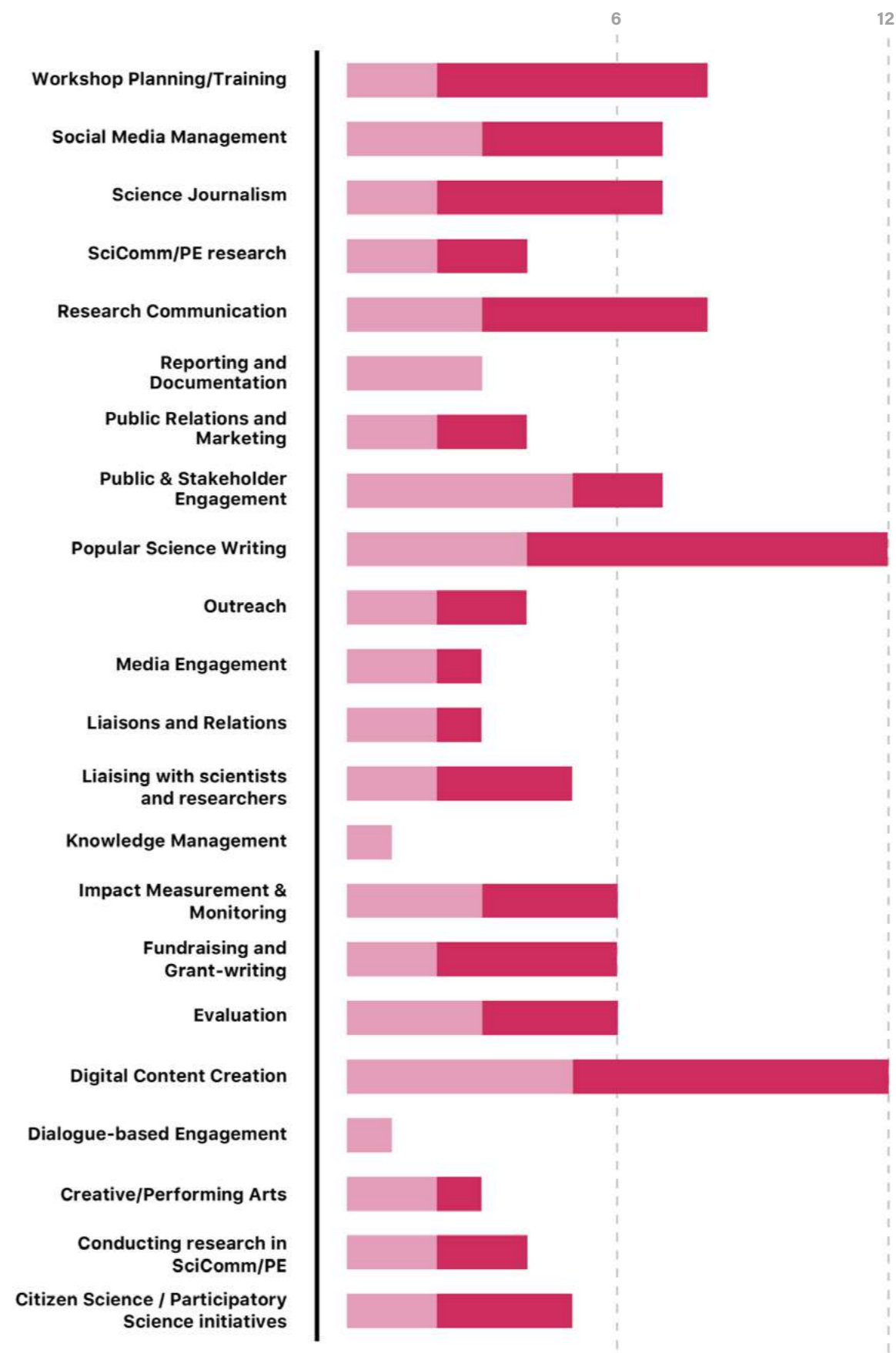
An analysis of SciComm training in India revealed a diverse range of professional roles among participants. The majority identified themselves as SciComm/PE professionals, with students and scientists also represented. While many were employed by organisations

such as government agencies, research institutes, academic institutions, or non-profits, a small percentage worked as freelancers. Additionally, a noteworthy portion comprised citizens driven by a passion for science. A minority of respondents were involved in research, and a smaller fraction served as teachers, trainers, or facilitators in SciComm/PE endeavours.

III. Mapping training needs for students & scientists

Identifying the training needs of students and scientists (the two primary beneficiaries of the proposed SciComm/PE training framework) revealed a preference for popular science writing and digital content creation in our survey. However, the needs of scientists are more varied compared to those of students, with a significant emphasis on public and stakeholder engagement. Current roles and responsibilities align closely with identified training needs, underscoring the importance of tailoring science communication training programmes to meet the diverse needs of both students and scientists in India's scientific community.

FIGURE 3 : DIVERSITY OF TRAINING NEEDS OF STUDENTS AND SCIENTISTS WHO COMMUNICATE SCIENCE



IV. Conversations with the community (Emerging themes)

The conversations with SciComm/PE trainers and students in India revealed several key themes.

1. Host organisations' mandates and interests significantly influence the implementation of SciComm courses by influencing the focus, structure, and priorities. For instance, research institutions with strong ties to government departments may prioritise training that emphasises the communication of research findings with policymakers.

2. The presence of trained and diverse faculty members was emphasised, with both trainers and students expressing concern about the need for exposure to various perspectives and experiences in science communication.

3. The unique Indian context poses challenges such as communication in regional languages, navigating cultural sensitivities, and fostering interdisciplinary collaborations.

4. Funding and sustainability emerged as critical issues, with concerns raised about securing funding for scaling up initiatives, ensuring the longevity of workshops, and overcoming disinterest from the research community, particularly faculty members, which can demotivate students.

Addressing these themes is essential for the development and sustainability of SciComm/PE training programmes in India.

RECOMMENDATIONS

I. Curriculum Development

A comprehensive framework that promotes an interdisciplinary curriculum, combining theory and practical application and is formulated based on the experiences of the community of science communicators in India is needed. It should emphasise integrating communication skills, specialisation in multimedia techniques, and ethical considerations in the Indian

context. Additionally, experiential learning opportunities and case studies should be integral to the curriculum to nurture hands-on engagement and critical thinking among learners.

II. Accreditation and Certification

Establishing accreditation standards is vital to ensuring the quality and credibility of science communication programmes. Recognition of professional certifications further enhances the legitimacy of practitioners in the field, fostering trust and competence among stakeholders.

III. Institutionalisation of Capacity Building in SciComm

Institutionalising capacity building in science communication should be done by integrating dedicated training into academic curricula and establishing specialised departments or centres within educational institutions.

IV. Proposed framework for SciComm-PE training in India and implementation

A customisable modular framework for science communication training in India developed by this working group aims to address the diverse needs of stakeholders in SciComm in India. The framework can be tailored to undergraduates, postgraduate students, and early career researchers by academic and research institutions supported by both government and non-government agencies.

The successful implementation of the framework requires a strategic approach. Firstly, **the establishment of a governing body or consortium dedicated to science communication education** is imperative to oversee the development, implementation, and evaluation of standardised guidelines and accreditation standards. Secondly, **effective coordination with academic institutions, government agencies, and industry partners** is crucial to facilitate the integration of science communication courses into existing

academic curricula, leverage government support for initiatives, and tap into industry expertise and resources. Lastly, **ensuring the sustainability of the framework requires the allocation of adequate resources and the establishment of funding mechanisms.** Securing funding from both public and private sources, as well as exploring innovative financing models, would enable long-term viability and scalability. Additionally, **continuous investment in infrastructure, technology, and human capital** is essential for maintaining the quality and relevance of SciComm/PE training.

CONCLUSION

The intended outcome for this working group has been to ensure the creation of a comprehensive framework for SciComm/PE training that is relevant to the Indian context and promote the institutionalisation of this framework for a more sustainable and systemic training mechanism for practitioners in the country. The major output, the modular framework, was also designed for professionals responsible for communicating science, to build upon the individual capacities for various roles and responsibilities.

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³ Models of public communication of science and technology. Bruce Lewenstein, 2003.

⁴ What Science Communication Scholars Think About Training Scientists to Communicate. John C Besley, and Andrew H Tanner, 2011.

⁵ Professional Development vertical of the Alan Alda Centre for Communicating Science.

⁶ MSc/Postgraduate Diploma, Science Communication, University of West of England, Bristol, United Kingdom.

⁷ MSc, Science Communication and Public Engagement, University of Edinburgh, United Kingdom.



Modular framework for Science Communication training

https://bit.ly/scicomm_training_framework



SIULI MITRA
Consultant, Christian Medical College, Vellore



SUCHITHA CHAMPAK
Founder, SciRio



SHRUTI SUNDERESAN
Science Communicator and Public Engagement Practitioner



SHRIYA NAIDU
Program Associate, FAST India



SHREYA GHOSH
Communications Editor, European Molecular Biology Laboratory (EMBL), Germany



MOHIT KUMAR JOLLY
Assistant Professor, Indian Institute of Science, Bengaluru

⁸ The PCST repository

⁹ FactoryWisskomm, Handlungsperspektiven für die Wissenschaftskommunikation, Berlin 2021 (Last updated in June 2022)

¹⁰ Science Communication Education and Training across Europe (2.0) Updated on 22/02/2020

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¹³ GlobalSCAPE Survey database (Asia)

¹⁴ Survey by this Working Group

Working Group 4

Breaking Barriers: Connecting Science, Media and the Public

04

INTRODUCTION

In India, scientific information is predominantly disseminated to the public through broadcast media channels such as newspapers, magazines, radio, TV, OTT, and digital media. Even though scientific research primarily unfolds within institutional laboratories or industry, it is the media that serves as the conduit through which these advancements are brought to the wider public. In an era where scientific advancements impact various facets of our lives, a closer and more meaningful relationship between the scientific community and the media is imperative for the betterment of society as a whole.

Media houses, alongside independent journalists and reporters, play a critical role in ensuring the scientific information reaching public audiences is rigorous, cogent, and timely. This indispensable role became even more apparent during the COVID pandemic, wherein real-time updates and insights were relayed from the scientific community to the public through a variety of media channels, including interviews, explainers, and expert analyses. With the rapidly changing communication landscape globally and with

pseudoscience and misinformation finding new channels to spread rapidly, scientists' ability to engage more effectively with the media as well as for the media to be better informed about science has never been more important¹.

This symbiotic relationship between the scientific community and the media is essential for ensuring accurate and timely dissemination of information that could promote not only evidence-informed decision-making at all levels of society but also enhance public trust in science.

However, in India, the relationship between the scientific community, the media, and the public is a complicated one and has yet to evolve to its full potential.

Furthermore, India's vast linguistic diversity presents a challenge for the dissemination of news, especially when it comes to science and technology². While the media wields immense influence over public understanding of science, the lack of science journalists, translators, and scientific experts proficient in regional languages severely affects the distribution of science news.

"Science is too exciting to be confined to labs. SciComm ThinkLabs could help unlock doors and spark dialogue between scientists and the media, helping package science into stories everyone can understand and benefit from. Brainstorming at the ThinkLabs showed us that the most practical way to create this bridge is through a media residency programme at scientific institutes. I am very much looking forward to India's first science media residency as a tangible outcome of the SciComm ThinkLabs."

Subhra Priyadarshini



OBJECTIVES

As part of the SciComm ThinkLabs, the **Science and Media Working Group** aimed to investigate the aforementioned areas to improve science and media connect. The group identified two broad objectives as part of the study:

- i) To explore the state of interaction between scientists and the media
- ii) To understand the process of producing a science story in Indian media

METHODS

The working group deployed surveys as the primary method of both qualitative and quantitative data collection, as well as informal stakeholder consultations to supplement our landscaping work. The Survey 1 (for scientists, science communicators, and science journalists) ran for about 3 months, and Survey 2 (science journalists) ran for about 2 months. The working group members also attended the first ever Science Journalism Association of India (SJA) Conference to understand the current interplay of factors impacting science reporting in our country.

We acknowledge the limitations of the current study, including the absence of systematic interviews, a sample size that may not be entirely representative of the media and science landscape, responses by media professionals or those writing/reporting in English or Hindi, and a lack of relevant literature within the Indian context.

KEY FINDINGS

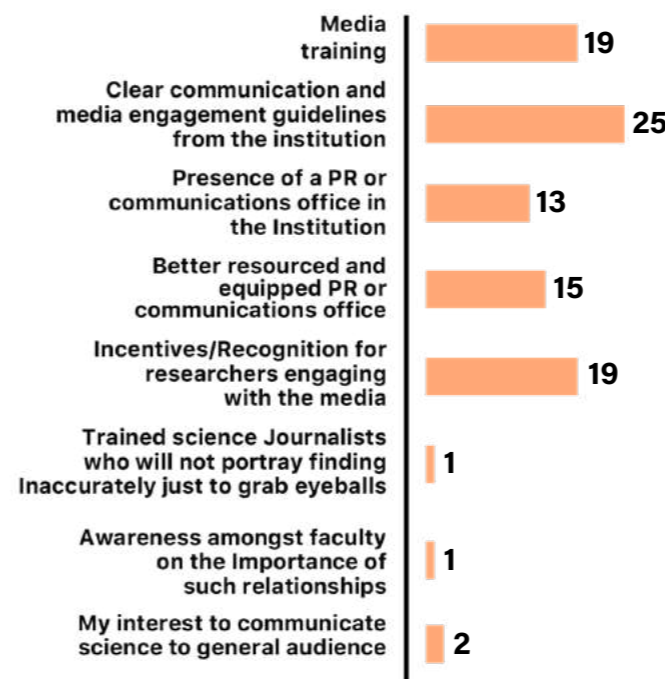
I. Interactions between the scientific community and the media:

The target audience for the first survey were scientists, science communicators, and press officers based at scientific/research

This language barrier inadvertently contributes to the science and society disconnect.

Understanding the challenges, barriers, and opportunities from both scientific and media perspectives is essential for bridging the gap between science, the media, and the public. For instance, examining the intricacies of creating a science story for the media can uncover factors that significantly impact news quality and could potentially influence public understanding of critical issues. Similarly, grasping the factors that affect scientists' ability to engage with the media is crucial for establishing effective processes and structures to facilitate such engagement. Analysing these dynamics within the Indian science and media landscapes can facilitate the development of appropriate measures to foster closer collaboration between these communities, particularly on matters of societal progress and well-being.

FIGURE 1 : FACTORS THAT WOULD ENABLE SCIENTISTS TO INTERACT WITH THE MEDIA MORE EFFECTIVELY



institutions in India. This survey, circulated in networks of scientific institutions/science communicators' channels in India, received 60 suitable responses, comprising 18 science communicators/ press officers, and 42 scientists. A separate survey of science journalists was conducted, which received 22 responses.

Some key takeaways from the survey were as follows:

- 50% scientists indicated the presence of science communication/press offices at their institution.
- When enquiring about scientists' experience interacting with the media:
 - a. 33% said that their job doesn't require them to interact with journalists
 - b. 31% of scientists indicated a largely positive (very good or good) experience interacting with the media

- c. 24% indicated that these interactions were neutral in nature - neither good, neither poor;
- d. 12% mentioned that their experience was "poor".

- All respondents mentioned that they are open to media requests for covering their research, depending on their availability, institutional permissions, and area of research.
- On factors that would enable scientists to interact with the media more effectively, the respondents indicated a need for **clear policies and guidelines, formal training, institutional structures, and incentives for media engagement.**

- On enquiring about the time a scientist source spends interacting with journalists,
 - a. 59% of the respondents were "neutral/ neither satisfied neither dissatisfied"
 - b. 32% responded as being "satisfied"
 - c. Only 1 respondent each mentioned being "dissatisfied" and "very satisfied".

- When asked about the quality of their interactions with scientists:
 - a. 63% indicated that these interactions were neutral in nature - neither good, nor poor.
 - b. 31% indicated that these interactions were good or very good.

- The **top two responses** to the question "Factors discouraging you from interacting with scientists and researchers" were as follows:
 - a. Scientists do not respond to media requests;
 - b. Scientists do not have enough time

"Journalists don't appreciate the slothfulness of scientists and scientists don't understand why journalists are always in a hurry."

"The day community engagement becomes a metric for success, scientists will automatically start communicating their research."

II. Barriers and enablers to producing science stories in media

The target audience of the second survey was science journalists (independent or employed at a media house). The survey, circulated through formal and informal networks of science journalists in India, received 22 suitable responses, comprising science journalists working as editors (5), reporters, and writers (17). The following key insights emerged from the survey:

- When asked about the impact of academic/professional training on their career as science journalists, respondents indicated that the training has been extremely useful (27%), very helpful (46%) or somewhat useful (27%).
- 50% of respondents employed with a media house in full-time capacity mentioned that their organisation has a dedicated science coverage team, while another 50% mentioned the contrary.
- 41% of respondents have come across instances of inaccurate science coverage.
- Only 27% of respondents indicated that organisations devote adequate time and effort to fact-checking. When asked about bottlenecks in the process of fact-checking, budget issues were of primary concern.
- When asked about the journalists' opinions on whether the coverage of science-related news has improved in India since the time they started in the industry,
 - a. 38% were not sure/ not equipped to answer the question.
 - b. 31% stated that the quality has improved to some extent;
 - c. 19% stated that the quality has improved significantly;
 - d. 13% stated that the quality has relatively stayed the same
- Responses to our survey demonstrate that science journalists use primarily four sources



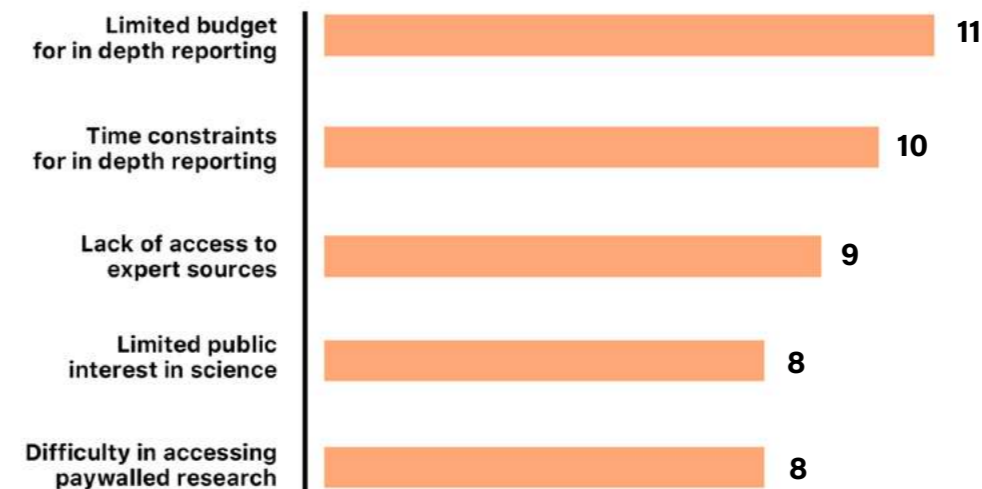
to find leads for potentially newsworthy science stories:

- a. Personal networks
- b. Press releases from publishers
- c. Press releases from science institutions
- d. Social media

The responses above reinforce the **successes of Indian science institutions hiring professional science communicators.** Further, our findings also bolster the notion that **social media is increasingly emerging as a platform for the dissemination of scientific findings.**

- The top 5 barriers to science journalism in India, as mentioned by respondents, are:
 - a. Limited budget for in-depth reporting
 - b. Time constraints for in-depth reporting
 - c. Lack of access to expert sources
 - d. Limited public interest in science
 - e. Difficulty in accessing paywalled research

FIGURE 2 : TOP BARRIERS TO SCIENCE JOURNALISM IN INDIA



Summary of survey findings:

- The relationship between science journalists and scientists in India seems to be on a positive trend.
- The prevailing concerns about lack of engagement primarily pertain to logistical aspects rather than being driven by inherent value judgements. There is potential for better engagement.
- Science communicators were recognised by both scientists and the media as a group that could help bridge the gap.
- The science-media relationship needs to be streamlined and can be better supported through formal programmes. Clear institutional guidelines, incentives, and/or professional platforms have the potential to streamline this relationship.

III. Platforms and opportunities that bring together scientists and media

In order to better understand current interventions to improve science-media engagement, we identified a few platforms that are helping strengthen the relationship

between scientists and journalists across the globe. These included the Science Media Centre (UK), the AAAS/EurekaAlert (USA), the Journalist in Residence Fellowship with the Max Planck Institute (Germany), the Journalist in Residence Fellowship with the Heidelberg Institute for Theoretical Studies (Germany), the Knight Science Journalism Fellowship with the Massachusetts Institute of Technology (USA), Science for Africa - AFJA Awards, World Federation of Science Journalists (Canada) and the British Science Association Media Fellowship (UK).

India has a limited number of platforms that strengthen the link between science and media, including the Science Journalists Association of India (SJA)³, the S&T Media Communicators Conclave (India International Science Festival), the 3CS Media Fellowship (Ashoka University), and an informal WhatsApp group that facilitates media requests and public relations for scientific beats. Without professional or formal platforms, opportunities for meaningful dialogue and collaboration between scientists, journalists, and communicators are limited.



Our hypothesis was that implementing an immersive **media residency programme** would strengthen the connections between the science and media communities. As part of both scoping surveys, we asked scientists, science communicators, and science journalists about the anticipated efficacy of a media residency programme. Notably, all respondents acknowledged the potential value of this initiative, either fully endorsing or partially recognising its benefits, indicating a positive outlook for the programme's future impact.

A programme that encourages collaborative thinking between scientists and journalists will not just help **sensitise both entities** but will also enhance public understanding of science, inspire curiosity, drive innovation, and promote informed decision-making at individual and societal levels.

RECOMMENDATIONS

To address the findings of both our objectives, this working group has produced two outputs:

I. A framework for a science journalist residency programme

This framework was prepared to enable meaningful connections between scientific and media communities, thereby fostering improved outputs. The programme, which is divided into three parts (training, residency, and outputs), aims to provide journalists with the opportunity to spend time at a scientific institution for a short duration to gain nuanced insights into how science works. This residency programme framework is adaptable to meet the needs of any institution, with the goal of cultivating nuanced reporting that accurately reflects scientific endeavours in the Indian context while also examining science from a societal perspective.

II. Findings of our scoping survey on the contours of science journalism practice in India

Our group has prepared a preliminary report⁴ that reflects opinions on barriers to effective science journalism, interactions between scientists and science journalists, and perhaps most notably, provides evidence of

an improving relationship between science journalists and scientists in India.

CONCLUSION

Our study has not only provided early insights into the relationship shared between science and media ecosystems in India but has also validated this group's hypotheses around factors influencing this relationship.

From the data collected through both our surveys and informal consultations, it is evident that there is a pressing need for systematic interventions that can enhance meaningful and timely interactions between science and the media.

The group has developed a comprehensive framework for a media residency programme tailored to science journalists in the Indian context and has produced a paper documenting our findings on the contours of science journalism practice in India. Moving forward, we encourage the dissemination, adoption and utilisation of both outputs in the interest of fostering collaboration between professionals in the scientific and media communities.

Acknowledgements:

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Survey Questionnaires & Framework for Science Journalism Residency Programme in India

https://bit.ly/science_media_resources



SHRUTI SUNDERESAN
Science Communicator and Public Engagement Practitioner



DEBDUTTA PAUL
Science Writer, International Centre for Theoretical Sciences, Bengaluru



SAYANTAN DUTTA
Faculty, Centre for Writing and Pedagogy, Krea University



UTSAV THAPLIYAL
Program Associate, FAST India



SUCHIBRATA BORAH
Program Coordinator, Mongabay, France



ANKITA RATHORE
Program Manager – Science Communication, IndiaBioscience, Bengaluru

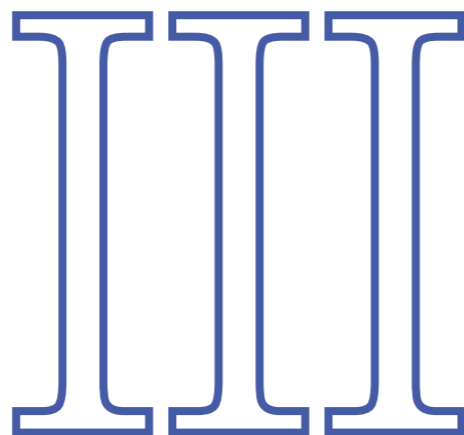
¹How Social Media Is Shaping Indian Science, The Wire, 2019

²Science Journalism in India, Pantento Press, 2004

³Report: The first conference of SJAI: Building bridges with India's scientific ecosystem, IndiaBioscience, 2024

⁴Science Journalism Practice in India: Results From a Scoping Survey. Datta, S., Sundaresan, S., & Thapliyal, U. (2024, January 19).

Summary of Recommendations



SCIENCE COMMUNICATORS

- Enhance communication skills through ongoing training aligned with national and global trends to maintain relevance and effectiveness.
- Serve as a connector, bridging diverse stakeholders to foster stronger relationships between science and society, promoting mutual understanding and collaboration.
- Utilise rigorous research methods to define and measure the scope and impact of SciComm/PE initiatives, ensuring evidence-based practices.
- Embrace innovative and culturally competent SciComm/PE approaches, targeting underrepresented audiences to broaden engagement.
- Contribute actively to the development of strategies, best practices, and benchmarks, advancing the field of SciComm/PE through shared learning and improvement.

SCIENTISTS

- Recognise the significance of effective SciComm/PE as integral to research activities, fostering broader impact and societal relevance.
- Participate in science communication training and workshops to hone communication skills and effectively convey research findings.
- Collaborate with science communicators and support outreach initiatives of your institution to bridge the gap between science and society.
- Utilise social media and other platforms to disseminate research findings and engage with the public, enhancing accessibility and understanding of scientific research.
- Proactively engage with the media to share scientific information accurately and transparently, fostering public trust and understanding.

- Prioritise diversity and inclusivity in both SciComm/PE practice and research to ensure representation and relevance across all communities.

- Advocate for SciComm/PE within your institution and across the scientific community, promoting a culture of communication and dialogue on science.

SCIENTIFIC INSTITUTIONS

- Establish dedicated SciComm/PE teams or roles, acknowledging and prioritising the necessary skill sets and expertise required.
- Ensure SciComm/PE staff receive competitive salaries and sufficient professional development opportunities.
- Develop clear SciComm/PE strategies, goals, and outcome frameworks to guide efforts effectively.
- Invest in high-quality SciComm/PE infrastructure, communication channels, and platforms for optimal outreach.
- Allocate resources and support for students and scientists to actively participate in SciComm/PE activities.
- Proactively foster collaborations with scientific institutions, communicators, media, and other stakeholders to strengthen public understanding of and engagement with science in the country.
- Embed SciComm/PE into institutional culture and governance, emphasising its importance and value.

GOVERNMENT

- Develop a long-term strategic and actionable roadmap for SciComm/PE to ensure sustainability and impact.
- Establish high-quality courses and accreditation standards for professional training in SciComm/PE in line with global standards.
- Develop and implement innovative platforms and programmes to foster meaningful engagement among science, society, and media.
- Pursue proactive policy-making initiatives to foster public engagement with science that align with evolving societal needs and priorities.
- Support SciComm/PE research and evaluation alongside practical initiatives to ensure effectiveness and impact.
- Actively facilitate innovative collaborations between scientists, institutions, and communicators to amplify the reach and impact of SciComm/PE efforts.




FUNDERS

- Support platforms fostering the exchange of ideas, knowledge, and strategies to enhance SciComm/PE and strengthen the science-society relationship.
- Develop innovative, flexible, and sustained funding mechanisms to bolster SciComm/PE initiatives.
- Prioritise funding for SciComm/PE training programmes to build capacity and expertise.
- Research funders should mandate SciComm/PE plans in grant proposals and allocate dedicated funding for implementation.
- Evaluate and incentivise effective SciComm/PE practices to ensure impact and accountability.
- Promote transparency and accountability in research through proactive communication and engagement efforts.






MEDIA

- Recognise the pivotal role in promoting public understanding of science by allocating dedicated space for science reporting, akin to other beats.
- Ensure accuracy, rigour, and balance in science reporting to uphold journalistic standards and trustworthiness.
- Collaborate effectively with scientists and scientific institutions to access and relay reliable scientific information to the public, fostering informed discourse.
- Provide platforms for diverse voices and perspectives through high-quality science journalism, enriching public discourse and engagement with science.
- Promote public understanding of scientific issues and developments through accessible and engaging storytelling techniques and new age media channels.

FAST India

-  <https://www.fast-india.org/>
-  <https://in.linkedin.com/company/fast-india>
-  <https://x.com/FASTIndiaTrust>

India Science Festival

-  <https://www.indiasciencefest.org/>
-  <https://www.linkedin.com/company/indiasciencefest/>
-  <https://x.com/IndSciFest>
-  <https://www.instagram.com/indiasciencefest/>
-  <https://www.facebook.com/indiasciencefest/>

Overall, the deliberations during ThinkLabs and Huddle resulted in the above broad recommendations for various stakeholders involved in SciComm/PE in India.

For more information and other requests, write to: info@fast-india.org



**242, Okhla Industrial
Estate, Phase 3,
Delhi – 110001,
INDIA**

**info@fast-india.org
www.fast-india.org**

