Equity and Inclusion in Indian STI: Insights from a Symposium Series

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Introduction

The draft Science, Technology and Innovation Policy (STIP) 2020 underscores the importance of equity and inclusion within India's science, technology, and innovation (STI) sectors. This topic received widespread international attention, particularly during India's G20 Presidency in 2023. At the second meeting of the G20-Chief Science Adviser's Roundtable (G20-CSAR), centred around the theme of 'Diversity, Equity, Inclusion, and Accessibility (DEI&A)', attendees acknowledged the significance of lingual diversity and the inclusion of traditional indigenous knowledge systems in policy discussions. An integral aspect of DEI&A is ensuring the involvement of socially and historically marginalised sections in the STI sectors. Marginalisation may stem from various factors, including gender, race/ethnicity, caste, disability, culture, language, region, religion and political leanings.

Despite ongoing scholarly and policymaker interest, the Science, Technology, Engineering, Mathematics and Medicine (STEMM) field remains non-inclusive for individuals from different backgrounds, a situation prevalent worldwide. This is exacerbated by binary frameworks, such as gender (female and male), race (black and white), and caste (upper and lower caste), which often limit scholarly discourse. Similarly, policymakers



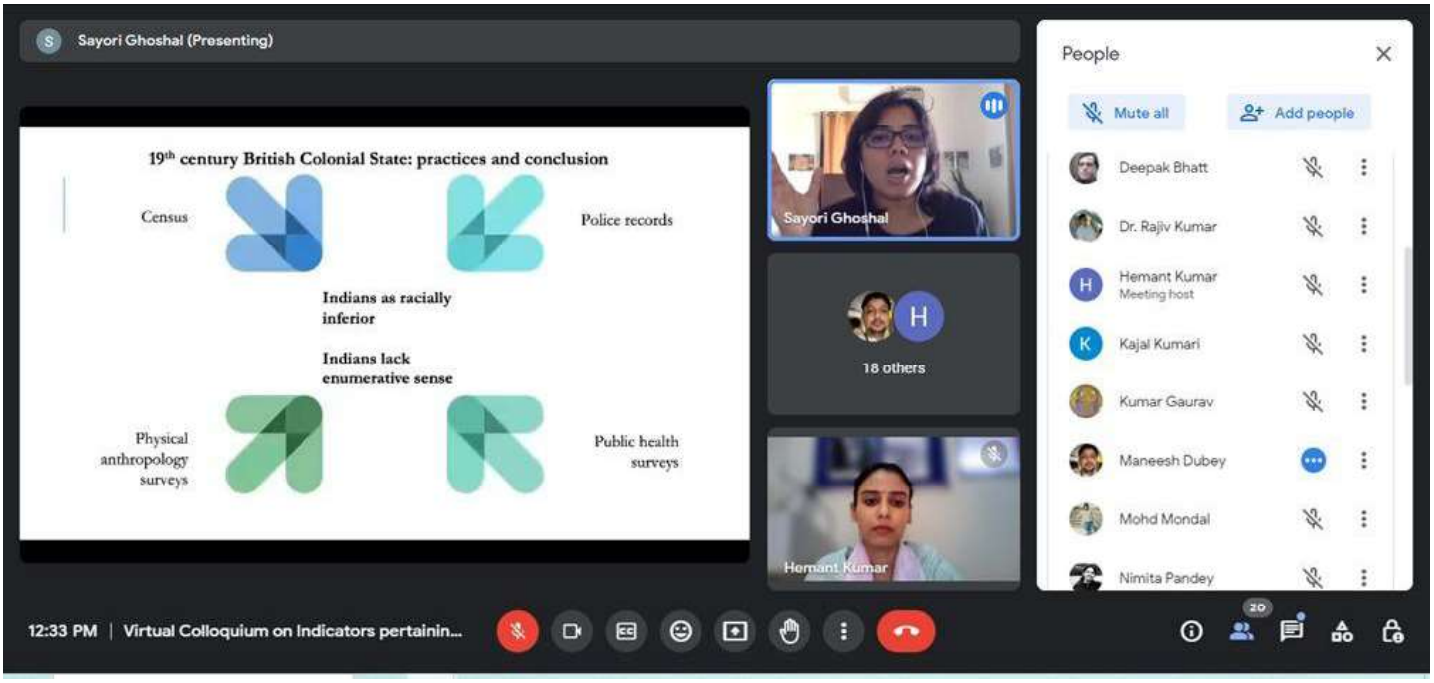
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tend to adopt a top-down approach based on quantitative data to address issues related to marginalisation, especially in India. There is a lack of policy measures that are grounded on qualitative data or the lived experiences of marginalised groups. With this context in mind, the Department of Science and Technology-Centre for Policy Research (DST-CPR) was established in April 2023 at the Department of Studies in Science, Technology and Innovation Policy (DSSTIP), School of Social Sciences at the Central University of Gujarat (CUG), India. Its research focuses on developing indicators, using both quantitative and qualitative measures, to assess marginalisation levels and formulate evidence-based policies for India's STI sector.

This report compiles discussions held during a symposium series organised by DST-CPR. The series comprised three events held in December 2023, January and February 2024, featuring academics and researchers from diverse institutions of higher learning and civil society organisations across India. These speakers provided insights into various forms of marginalisation in the STI sector, offering diverse perspectives to address challenges related to access and equity.

Prof. Pranav Desai, former Professor, Centre for Studies in Science Policy, Jawaharlal Nehru University, New Delhi, emphasised the significance of developing relevant indicators in general and specifically for mapping marginalisation in the STI sector. In addition, he contextualised the narrative of measurements in STI by placing it within its historical framework and chronicled the development of different widely used STI indicators while providing insights on what may be gleaned from them. Furthermore, he contended that instead of replicating these measures formulated in a Western framework, our attention should be directed towards creating indicators appropriate for the Indian context. It is necessary to incorporate the informal sector, such as grassroots innovations and social audit of STI, focusing on proper indicators that accurately represent evolving patterns and encourage diversity.

Prof. Geeta Chadha, Obaid Siddiqi Chair at National Centre for Biological Sciences, Bengaluru, identified gender marginalisation as a critical factor in addressing issues of access and equity in STI sectors. She pointed out that the feminist distinction between 'gender' and 'sex' has led to the 'naturalisation of femininity'. She further stated that it is necessary to acknowledge the existence of gendered marginalisation in the STI sector, which encompasses a range of various genders rather than just the binary categorisation of female and male.



Dr Sayori Ghoshal, Post-Doctoral Fellow, Krea University, looked at the gender bias in STI from the post-colonial perspective and highlighted how the colonisers looked at Indians as an inferior race. Further, Dr Namita Pandey, faculty at Entrepreneurship Development Institute of India, Ahmedabad, stressed that the field of science is not value-neutral and factors, including social, cultural, economic, and institutional, lead to a bias against women in the STI sector. She also highlighted the importance of gender and suggested that promoting gender equity in STEMM education, workforce, and leadership ensures a richer talent pool and a broader range of perspectives.

Dr Astha Jaiswal, Project Manager, Shri Rang Foundation, Vadodara, Gujarat, raised concerns towards the working environment in STI, which is highly biased towards women. Beginning with the fundamental difference between sex and gender, she elevated to equity issues, gender ratio, underrepresentation of women in the STEMM field/ scientific profession, leaky pipeline, meritocracy, and above all, how women have the double burden of managing home and workplace. To address the issues related to women, she emphasised exploring these issues through lived experiences or phenomenological methods rather than using quantitative measures.

Dr Pawan Kumar, Assistant Professor, SRM University, Sonepat, argued that gender exclusion is rooted in neo-liberal capitalism, and there is a need to underline the critical importance of understanding the relationship between capitalism, democracy, and gender dynamics. He proposed structural changes and advocated for a nuanced approach that not only addresses historical and immediate crises but also challenges the underlying structures of exclusion within the neo-liberal framework.

Dr Sherin Sabu, Assistant Professor, Indian Institute of Technology (IIT) Jodhpur, discussed the sociological evaluation of indicators related to gender equity and inclusion within the IITs, with a focus on insights derived from the Gender Advancement for Transforming Institutions (GATI) pilot project conducted at IIT Bombay in 2022. The GATI project, initiated by the DST in 2021, aims to promote gender inclusivity in STEMM across higher education and research institutions in India. Concerns were raised over low percentages of women faculty hired annually, especially in STEMM fields, indicating challenges in translating increased female graduates into corresponding job opportunities.

Referring to the electronic vehicle (EV) sector, Dr Rajeev Kumar, Post-Doctoral Fellow, DSSTIP, CUG, urged to establish a thorough framework to cultivate an inclusive environment for innovation. He further emphasised that collaboration with diverse stakeholders, including researchers, policymakers, industry experts, community representatives, and advocacy groups, is essential for obtaining an impartial perspective



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in merging areas of STI, such as EV. Dr Manish Dubey, faculty at Dr Babasaheb Ambedkar Open University, Ahmedabad, raised his concern over marginalisation in the education sector and suggested inclusiveness of educational technologies among users.

Another aspect of marginalisation during the discussions was related to disabilities, which has not been largely emphasised thus far. Dr Zarana Maheshwary, Assistant Professor, Department of Comparative Literature and Translation Studies, CUG, pointed out that individuals from historically marginalised groups, particularly those with disabilities, frequently encounter systematic exclusion, leading to a lack of varied viewpoints and untapped resources. Moreover, mental disability can potentially manifest alongside physical disability, and both can affect anyone at any given moment.

Prof. Anita Ghai, Former Professor, Ambedkar University, New Delhi, highlighted three key points. Firstly, she addressed the challenges posed by a lack of knowledge and understanding regarding disability in terms of epistemology and ontology. Secondly, she pointed out the oversight in the advancement of STI research, which fails to prioritise individuals with disabilities as beneficiaries. Lastly, she asserted the potential benefits of adopting a post-humanist approach to comprehend disability better and develop a more inclusive knowledge system.

Prof. Chandri Raghava Reddy, Department of Sociology, University of Hyderabad, spoke about well-known models like the Person Assistive Technology Model (MPT Model) and Human Activity Assistive Technology Model (HAAT) that propose ways to address the needs of persons with disabilities and create an inclusive environment. Dr Priya Ranjan Kumar, Assistant Professor, Department of Studies in Gandhian Thought and Peace Studies, CUG, emphasised seven principles, namely *Equitable use, Flexibility in use, Simple and intuitive use, Perceptible information, Tolerance for error, Low physical effort, Guidelines, and Size and space for approach and use* of Universal Design for Learning (UDL), a framework developed by North Carolina University. Citing various lived experiences, he emphasised the behavioural issues of marginalisation towards persons with disabilities in higher education and research institutions.

Conclusion

The symposium series provided a platform for stakeholders to voice concerns and propose solutions regarding marginalisation in India's STI sector. The deliberations proved helpful in identifying challenges to equity and inclusion in the dynamic STI landscape, particularly in the Indian context. A key highlight of the three-part discussion series was Prof. Chadha's intervention on the need to develop a better methodology for studying marginalisation, mainly by applying the concept of 'intersectionality'. A concurrent view was that rather than using the 'one size fits all' approach, policy solutions should be designed based on the needs of different STI sectors for strengthening diversity, equity and inclusion.

Acknowledgement

The authors thank the Department of Science and Technology (DST), New Delhi, for funding DST-CPR at DSSTIP, SSS, CUG.