Strengthening Women's Leadership in Indian Science: A Pathway to Inclusive Innovation

Sneha Sinha (Consultant, RIS)

Karina Kumari Biswal (Student, XIM University, Bhubaneswar)

The International Day of Women and Girls in Science is both a moment of celebration and a call for reflection. For India, where scientific capacity underpins economic growth, technological sovereignty and global competitiveness, the conversation has evolved. The question is no longer whether women are entering science, but whether they are able to advance, lead and shape the country's research and innovation priorities.

India has made significant progress in expanding women's access to science education. Women today account for approximately 43 per cent of enrolment in Science, Technology, Engineering, Mathematics and Medicine (STEMM) disciplines across higher education institutions. In absolute terms, this represents millions of women acquiring scientific training each year, creating a substantial reservoir of talent for research, industry and policy. At the level of entry, the gender gap has narrowed considerably, reflecting sustained policy efforts and a broader societal shift.

However, this trajectory changes sharply beyond graduation. Despite near parity in enrolment, women constitute only about 18-19 per cent of India's research and development (R&D) workforce. They remain underrepresented in senior academic positions, scientific advisory bodies and institutional leadership roles.

This pattern is often described as a "leaky pipeline," but the metaphor only partially captures the structural nature of the challenge. Women's attrition is most visible at mid-career stages, when caregiving responsibilities, career breaks and rigid tenure timelines intersect. Evaluation systems that prioritise uninterrupted trajectories, conventional productivity metrics and informal professional networks further constrain advancement. These constraints are institutional rather than individual, and addressing them requires systemic reform.

India’s policy framework has recognised several dimensions of this issue. The Department of Science and Technology’s Women in Science and Engineering initiatives, including re-entry fellowships, have enabled many women to resume research careers. Complementary schemes such as SERB-POWER, Vigyan Jyoti, BioCare, CURIE and GATI seek to strengthen institutional infrastructure and promote gender-responsive policies. Ministries and agencies including the UGC, DBT, CSIR, AICTE and MeitY have introduced scholarships, mentorship programmes and targeted fellowships to support women across career stages. Together, these initiatives reflect a clear commitment to mitigating structural barriers.

Yet targeted programmes alone cannot fully resolve systemic imbalance. Re-entry fellowships address interruptions after they occur but do not fundamentally alter recruitment norms, tenure expectations or leadership pathways. Embedding gender responsiveness within core institutional processes such as evaluation frameworks, promotion systems and funding criteria is essential for sustained change. Accountability mechanisms, gender-disaggregated reporting and leadership targets can strengthen this transition from participation to authority.

The broader policy context reinforces this urgency. Recent Union Budgets have reiterated commitments to gender-responsive development and expanded investments in future-oriented sectors such as artificial intelligence, biotechnology, digital technologies and advanced manufacturing. While these allocations signal ambition, they largely remain gender-neutral in design. In rapidly evolving technological domains, neutrality can inadvertently perpetuate existing disparities. Integrating gender-linked outcomes into science funding and monitoring frameworks is therefore critical to ensure that women not only enter emerging fields but also shape their direction.

Ensuring women’s sustained participation in science is not merely an equity concern. Diverse research teams contribute to more inclusive problem-solving, improved risk assessment and socially responsive innovation. As India strengthens its scientific ecosystem, the focus must shift from access to influence. Expanding women’s participation in education has laid the foundation; the next step is enabling their leadership. Doing so will enhance not only fairness, but also the quality, resilience and global competitiveness of India’s knowledge economy.