Science and Diplomacy: Catalysts for India's Vision of 2047

India's journey towards becoming a developed nation by 2047, the centenary of its independence, is a defining mission of the current government. The vision of '**Viksit Bharat @ 2047**' was notably emphasised by Hon'ble Prime Minister Narendra Modi in his Independence Day speech on 15 August 2024, where he called upon the 140 crore citizens of India to collectively resolve to transform the country into the third-largest economy in the world. The role of Science, Technology, and Innovation (STI) is critical to achieving this ambitious vision, which will serve as the backbone for propelling India into a new era of growth, development, and global leadership.

A key initiative driving this transformation is the establishment of the Anusandhan National Research Foundation (ANRF), a premier body designed to promote research, development, and innovation across India's universities, research institutions, and R&D laboratories. By encouraging collaborations among industry, academia, and government, the ANRF will catalyse the creation of cutting-edge technologies and solutions that are essential for India's rise as a global power by 2047. The recently approved BioE3 (Biotechnology for Economy, Environment, and Employment) Policy is a significant step toward realising the Viksit Bharat vision. By focusing on sectors such as agriculture, healthcare, clean energy, and waste management, BioE3 aligns with the broader national objectives of innovation-driven development.

The importance of science and scientists in this Grand National vision was underscored by Hon'ble Vice-President Jagdeep Dhankhar at the 83rd CSIR Foundation Day Celebrations on 26 September 2024. He remarked, "You are the major stakeholders. You may not be that visible on the screen, but you are the driving force of it. You will have to be contributing 24X7." His words echo the sentiment that scientific innovation and ingenuity will be indispensable to India's development journey.

Guided by this vision, this special issue brings together insights from distinguished experts to explore the role of STI and science diplomacy in advancing the objectives of Viksit Bharat @ 2047. It highlights the crucial steps India must take to strengthen its global standing and ensure that STI continues to be a cornerstone of national progress.

Dr Arabinda Mitra, Former Scientific Secretary, Office of Principal Scientific Adviser to the GoI, offers a compelling vision of leveraging science diplomacy in key areas of co-development, co-investment, and co-production. His article advocates for joint research projects in frontier technologies, cross-border open innovation, and technology facilitation in sectors that serve India's national interests, including expanding market access. Science diplomacy, he argues, must be driven by collaboration and shared goals to advance both national and global priorities.

Dr Archana Sharma, Principal Scientist at CERN, discusses how India's leadership in the digital space can be further amplified through open-source collaboration, joint data sharing, and digital innovation. She emphasises the long-term benefits of assisting developing countries as they evolve and highlights the need for increased funding for R&D in science and technology. Her article makes a strong case for public-private partnerships and policy incentives to encourage innovation and the growth of India's R&D ecosystem.

Dr W. Selvamurthy, President, Amity Science, Technology & Innovation Foundation and co-author Sneha Nair, address India's challenges in science diplomacy, including resource limitations, bureaucratic complexities, and geopolitical considerations. They call for a focused effort from policymakers, scientists, and diplomats to streamline processes, enhance coordination, and prioritise international scientific cooperation in India's foreign policy agenda. Overcoming these hurdles, they argue, will require sustained commitment and innovative solutions.

Prof. V. Ramgopal Rao, Vice-Chancellor, Birla Institute of Technology and Science, Pilani and co-author Dr Arindam Kushagra, delve into India's potential to become a global leader in nanoelectronics by 2047. Their article highlights the gaps between research and innovation, particularly the need for stronger academia-industry collaboration. They advocate for an integrated approach where academia and industry work closely to develop new technologies, create jobs, and position India as a key player in semiconductor manufacturing and other high-tech sectors.

Finally, Dr Shailja Vaidya Gupta, Former Senior Adviser at the Office of Principal Scientific Adviser to GoI, explores the role of science diplomacy as a powerful yet underutilised tool in India's global influence. With the government's growing confidence in the country's scientific capabilities, she envisions that India's scientific soft power will play an increasingly significant role in shaping global affairs and advancing India's international stature.

As we present this special issue, we hope it will serve as a valuable resource for policymakers and stakeholders alike. The insights India's scientific community shares in these pages are vital to realising the vision of Viksit Bharat @ 2047. By embracing innovation, strengthening global partnerships, and fostering a culture of research and collaboration, India can indeed fulfil its destiny as a fully developed nation by its centenary year of independence.

Monika Jaggi