

Ache din (good days) for Indian science

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The media, both Indian and global, was abuzz analysing the first 100 days of the new Indian Government under Prime Minister Narendra Modi. Accomplishments, achievements and shortfalls of all kinds were analysed; from foreign policy to the decision to dismantle the Planning Commission. What was missing amidst all these high-decibel discussions and debates was the emergence of a space and a resurgent regime for Indian science, to actively engage with and steer forward the nation-building policies and processes. A not-seen-before space for, trust on and encouragement to Indian science and the scientific community clearly emerges from new Prime Minister's series of engagements with the scientific and research establishments in the first 100 days.

While science as a priority was not so prominent in the 2014 election manifestos of major political parties, the ruling party was clear in terms of greater investments in and promotion of science and technology in the country¹. '*Science and technology – India innovates, India leads*' was a well thought out idea that resonated well with their overall goal of 'one India, excellent India' (*Ek Bharat Shrestha Bharat*)². It is in this background that the new Government's engagement with science and the scientific community in the country has been profound, path-breaking and pragmatic.

Carefully reading through the sequence of events and engagements since the new Government took charge of India on 26 June 2014, one would be able to understand and appreciate the fact that a new dawn of hope, optimism, ownership and enthusiasm is in the offing for Indian science. Actions and encounters from the first 100 days are clear signs of processes through which Indian science is getting influenced by and integrated into the Prime Minister's call for and inspiration of *ache din* (good days). The quantum of support, guidance, encouragement and trust that Indian science has been witnessing at this point in time is absolutely unprecedented. And given the present Prime Minister's passion for exploring new avenues of science and technology-enabled governance, these are likely to increase in volume and scale in the coming days.

The first wave of support for Indian science came through the government's budget with a 4% hike in allocation for research and development over previous years. Although for some, this allocation of US\$ 6.04 billion spelled austerity³, it was certainly a bold step the present Government took in the face of 8.3% inflation⁴. Plans to set up a series of research hubs in the areas of agricultural biotechnology, Himalayan environment and solar power were announced as part of the budget.

The new Prime Minister's strategic engagement with Indian science began with his visit to the Department of Atomic Energy (DAE), Mumbai on 21 July 2014. Since then, he has participated in functions organized by scientific institutes and establishments in the country (such as ICAR's 86th Foundation Day, dedication of INS Kolkata, Mouda Super Thermal Power Project, etc.). He has used each occasion as an opportunity to reach out to the scientific community, recognize their hard work and reiterate the trust and expectation that the country has from Indian science.

ISRO's recent historic success of the Mars Orbiter Mission (MOM) – Mangalyaan, including its cost-effectiveness (INR 450 crores only) and efficiency, has become a business case for other interplanetary missions. The Prime Minister's congratulatory words reflect both recognition and respect: 'You have made a habit of achieving the impossible'⁵. Through this he also attempted to catalyse ISRO's shining moments into a momentum for Indian science. Mangalyaan and ISRO's ingenuity were mentioned in almost all the speeches he delivered during his recent US visit.

These efforts promote a culture where science and the scientific community are respected and recognized. A recurring theme in the new Prime Minister's efforts has been a departure from the traditional notion of 'science for society' towards that of 'science and society', highlighting the symbiotic relation. This is also to help understand the embeddedness and complementarity that exist and evolve as part of this relationship. That science is a top agenda of the Government was reflected in these first 100 days.

Performance and global competitiveness of Indian science had been an issue of intense discussion. Scholars and analysts have identified a variety of underlying factors, ranging from undue bureaucratic interference⁶ to inadequate resource allocation⁷ and feudal mindset⁸. Simultaneously, India faces multiple challenges of poverty reduction, food and nutrition security, environment protection and natural disasters. Specific, coherent and result-oriented scientific strategies are required to understand these complex issues and strengthen evidence-informed decisions and policies to address them. And because of this many countries are putting forward their best efforts to support and strengthen science. Ian Chubb, Australia's Chief Scientific Advisor's recent view is a glaring example of this emerging necessity: 'If we are serious in our wish for a fair and prosperous Australia, in a better and happier world, then we will look to science to sustain us.'⁹

Prime Minister Modi has been looking to Indian science and the series of his recent visits to many scientific institutes in the country and open discussions with the scientific community reaffirm this. This certainly does not seem a gesture politics, but a true reflection of the Government's highest political will for and trust in Indian science. It also demonstrates the present Government's commitment to infuse new strength and build-up the confidence level within the scientific community. Through his bold and visionary steps, Modi also challenges the scientific community to set newer goals for themselves and for the nation as a whole.

The first 100 days of the Prime Minister send across a message, loud and clear, to Indian science. This message is one of new opportunities, openness and optimism to make science the key driver in working towards the vision of 'together with all, development for all' (*sabka saath, sabka vikas*). This flourishing interest and involvement of the Prime Minister and his Government in science and scientific enterprises pave the way for new avenues for Indian science to do the followings.

Calibrate: This is an opportunity for Indian science to (re)calibrate and

reconsider its goals and objectives to better align them with the emerging national and societal aspirations and expectations. The Prime Minister has been focusing on this, albeit indirectly, by encouraging the scientific community to think of the end-users as integral part of their scientific thought process and endeavour. This calibration has also to be at the system and institutional levels in terms of new ways of looking at things and taking up newer challenges and risks. His suggestion to decentralize the process of scientific decision making and putting in young people, below 35 years of age, at the helm of affairs is aimed at mobilizing greater participation and leadership of the youth in Indian science. The new Prime Minister's first 100 days encourage Indian science to undertake a careful, context-specific and coherent calibration of its mission and vision.

Innovate: Innovation is at the heart of economic development and societal well-being. Although the Government of India declared 2010–2020 as the Decade of Innovation and tried to facilitate a paradigm shift in the system through the Science, Technology and Innovation Policy (2013), the results are not so encouraging. India ranks 76 in the Global Innovation Index (2014)¹⁰, which measures the innovation capabilities of 143 economies in the world. India was the only country, among the BRICS, which slipped 10 places below the 2013 rankings and this categorically highlights the urgency for appropriate and effective policies for nurturing the human capital¹¹. Innovation does not take place in vacuum and requires adequate and sustained institutional and financial support. Scientific entrepreneurship is an area which is likely to gain further support through the 'Make in India' campaign and in turn enrich the culture of innovation.

Collaborate: Enriching the usability of science is a recurring theme in many political discussions and discourses. But how do we ensure that the research-based evidence and scientific inputs are used in policy making and in turn generate more demand for scientific evidence? To address this, the Prime Minister has elaborated on the need for a 'robust interface' between science and its intended end-users¹². But his vision of science–policy–practice interface is a step ahead, where

he sees the passive end-users as active contributors to the process of scientific innovation and product development. The end-user might be a soldier, farmer, industry worker or a policy maker. This new vision of collaborative research is more inclusive, need-based, adaptive and demand-driven. Secondly, inter-institutional collaboration is essential to address complex and emerging challenges such as natural disasters and public health emergencies. Such needs of greater collaboration between India Meteorological Department (IMD), the Central Water Commission (CWC) and the disaster management authorities were highlighted during the recent Kashmir floods.

Integrate: The integration of science into the larger processes of governance, development and nation-building, including foreign policy and confidence-building measures, is at the heart of the new Prime Minister's notion of and call for Indian science. Such integration is essential to better inform policy and practice and to open up new vistas of learning and action. Secondly, it is not all about science getting integrated into the systems of governance and policy making, but also science facilitating the process of integration across boundaries and borders. One such initiative is the MyGov programme¹³ with an overall objective of 'good governance with your partnership', through which the Government invites 'expert advice' on a whole range of issues that concern India.

What is required at this point in time is to identify and invest in pathways and systems which would embolden Indian science and help restore some of its lost trajectories. Identifying these pathways and priorities needs an intelligent and strategic mix of bottom-up and top-down processes. Indian science has found the much-deserved space and opportunity to grow, both in quality and quantity.

Such initiatives could be multi-level and multi-stakeholder. The Scientific Advisory Committees, both to the Prime Minister (SAC-PM) and to the Cabinet (SAC-C), in consultation with the Ministry of Science and Technology could set the ball rolling by identifying key sectors where the engagement of science needs to be thought through and revised, as and when required, in the light of new challenges and opportunities. Required

investments, as well as institutional changes, could be worked out through multi-stakeholder consultations, including the private sector and industry. Participation of the younger generation of Indian scientists and researchers would bring to the table new ideas and perspectives.

Good days (*ache din*) are certainly in the offing for Indian science. But will Indian science and the associated systems be proactive to capitalize on these emergent opportunities under the new Prime Minister's leadership?

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