

PM's address at the Indian Science Congress

"As General President of the Indian Science Congress Association, it is my great honour to welcome our Chief Guest, the Hon'ble President of India, Shri Pranab Mukherjee. Our President is a distinguished statesman. His wisdom, knowledge and vast experience of public life are great national assets. I also welcome the galaxy of luminaries, practitioners, policymakers and worshippers of science who have come together today to celebrate the centenary of the Indian Science Congress.

By selecting Kolkata as the venue of this historic occasion, the Congress is celebrating its 100th Anniversary at the original home of the Association. Modern Indian science was largely nurtured here in the soil of Bengal. Kolkata's credentials in science are burnished not only by the impressive list of institutions it hosts today, but by the inquisitiveness, creativity and liberalism that have defined its residents for many generations. I thank the Government of West Bengal, particularly the Governor, Shri Narayanan, the Chief Minister, Kumari Mamata Banerjee, and the people of Kolkata for their unstinting support to the Science Congress.

I would also like to take this opportunity to felicitate the Executive Committee and Members of the Council of the Indian Science Congress Association for their work during the year and for achieving many of the initiatives I had outlined in my inception address in this very city seven months ago.

On the centenary of the Association, let us pause for a minute to recall the foresight and determination of its founding fathers – Sir Ashutosh Mukherjee, Professor J. L. Simonsen and Professor P.S. MacMahon. We also salute the genius and dedication of other stalwarts like Acharya Prafulla Chandra Ray, Sir RN Mookerjee, Sir Jagdish Chandra Bose, Sir M Visvesvaraya, Sir CV Raman, Sir SN Bose and Professor Meghnad Saha, who made this great institution a vehicle for the spread of knowledge and progress for the Indian nation. Let their commitment and social consciousness be the guiding spirit of today's scientists.

The theme of this Congress, 'Science for Shaping the Future of India', reflects the dream of every generation of Indian scientists. Faster growth over the next few decades, more sustainable development based on food and energy security, and socio-economic inclusion made possible by rapid growth of basic social services, such as education and health, are all crucial for defining India's future. Science, technology and innovation all have an important role to play in achieving these objectives.

Science and technology development have been central to the phenomenal material advancement and efficiency in the use of resources seen in the last hundred years. The pace of change has only accelerated in the last few decades, as globalization and new technology have enhanced people's access to knowledge and their ability to leverage it

through collaboration. India has benefited from this epochal transformation by embracing these trends.

Since technological changes typically emanate from established structures, they may at times re-inforce them and inhibit the advancement of equity and equality. As India seeks a sustained growth of its national income, we must endeavour to harness the tools of science to cater to the needs of the underprivileged and to bridge the gap between the haves and the have-nots.

Nearly 65 percent of our people live in rural areas. The increase in their living standards depends greatly on the growth of agricultural production and productivity. The Twelfth Five Year Plan assumes that a sustained growth of our agriculture at the rate of 4 percent per annum is essential for the achievement of food security for our country. This growth is constrained by shortages of water and also of land. We need new breakthroughs in water-saving technologies of cultivation, enhancement of land productivity and development of climate-resilient varieties. This transformation of agriculture must be the top priority concern of our public policies, including science and technology policies.

In keeping with the theme of this Congress, the question naturally arises as to what we should do to build our future through science? I would like to share a few ideas.

First, we must, as a society, enhance the spread of what Jawaharlal Nehru used to describe as the scientific temper. Our younger generations must adopt a science-based value-system in order to benefit from what science can offer and to make up for lost time. Complex issues, be they genetically modified food or nuclear energy or exploration of outer space, cannot be settled by faith, emotion and fear but by structured debate, analysis and enlightenment. A scientific approach and understanding of these issues are therefore as vital as our core scientific capabilities.

For this, we must invest in popularizing science, not only in our schools and colleges – as we are doing through the INSPIRE programme – but also in our homes, workplaces and communities through all available communication methods, like the high-speed optical fibre National Knowledge Network. Eventually, science must help in establishing an inclusive society that seeks to solve major social problems through the application of science.

Second, our scholarship and research must be informed by a keen awareness of our basic social and economic realities. Given the limited resources that we, as a nation, are able to devote to scientific research, it is imperative that we give priority to meeting those challenges which are fundamental to the transformation of our economy.

I have already referred to the need to transform India's agriculture. But there are other equally valid concerns as well which require priority attention. The quest for energy security, sanitation, provision of safe drinking water, labour intensive manufactures and universal healthcare at affordable cost are other areas of high priority concern. Our effort should be to carve out a niche for India's leadership in some of these areas. Indian industry must play an active part in this process through in-house research centres and, more importantly, through enhanced academia-industry interaction.

Third, a holistic organizational approach is essential. There was a time when science took a lonely road, driven by individual enterprise rather than collective effort. This is sub-optimal in the innovation and knowledge-intensive world that is empowering the growth process today. We need cross-fertilization of disciplines and synergy among stakeholders. Government-sponsored research must be supplemented by research in private labs. Academic and research systems must foster innovation and entrepreneurship and therefore link up with those interested in commercial development.

In the last few years, we have taken some policy measures in this direction. We have encouraged sharing of and access to Government-owned data for research. We have also created new mechanisms like Innovation Complexes, Technology Business Incubator and Innovation Universities in an effort to bring about convergence of interests among the various players in science.

Fourth, international collaboration is vital for increasingly resource-intensive modern science to progress. Economic liberalization and economic growth over the last several years have made it possible for our scientists to collaborate meaningfully and confidently in the international arena. Let me cite only two outstanding examples. There was significant Indian collaboration with the European Centre for Nuclear Research on the Large Hadron Collider, which led to the discovery of what is believed to be the elusive Higgs boson. The other example is our work with a select group of countries on the International Thermonuclear Experimental Reactor.

We must partner not only with established leaders in science and technology, but also with emerging innovation powerhouses, many of them in our region. We must also offer our expertise to our neighbours for collective prosperity and progress.

Finally, the quality of our scientific institutions will depend upon the quality of the students we can attract into science, the freedom we give them in pursuing scientific research and the human resource policies we follow in selecting leaders. We must select only the best and we must

expand our search to the many Indian scientists abroad who may wish to return to India at least for some years.

The solution of even the simplest of problems related to humanity's pressing needs often requires first-rate fundamental research. During the last eight years, we have tried to fill this gap by expanding the infrastructure of our scientific research and innovation. We have established five new Indian Institutes of Science Education and Research, eight new Indian Institutes of Technology, sixteen new Central Universities, ten new National Institutes of Technology, six new R&D institutions in the field of biotechnology and five institutions in other branches. It is my hope that all this will significantly raise the quality of scientific research in our country.

Given that science-led innovation is the key to development, the National Innovation Council has also brought the domain of innovation to the foreground, helping translation of knowledge into usable solutions.

The Science, Technology and Innovation Policy 2013 released here today aspires to position India among the top five global scientific powers by the year 2020. It is an ambitious goal. It aims to produce and nurture talent in science, to stimulate research in our universities, to develop young leaders in the field of science, to reward performance, to create a policy environment for greater private sector participation in research and innovation and to forge international alliances and collaborations to meet the national agenda. The Twelfth Five Year Plan, which was approved by the NDC a few days ago, outlines a number of initiatives which will make this possible.

An important step in this direction in the Eleventh Plan was the establishment of the National Science and Engineering Research Board as an autonomous funding body. As pointed out in the Twelfth Plan, this institution proposes to invest in researches of proven track record and establish about 200 to 250 centres based on a grant model with performance reward linkages.

I would like to conclude by recalling Gurudev Rabindranath Tagore's immortal lines in which he prayed for a future India where, among other things, a "clear stream of reason" would prevail. I am confident that, in the next five days, this confluence of leading lights of science from home and abroad will throw up useful ideas on how science will shape the future of India. As the Indian Science Congress crosses another milestone, let us pledge to keep alive the passion of its architects for truth that is eternal and beautiful and their dream to lead India to greater heights of knowledge.

Let me also take this occasion to wish all those gathered here a very Happy New Year."