

91ST INDIAN SCIENCE CONGRESS : RECOMMENDATIONS

The focal theme of the 91st Indian Science Congress was "Science & Society in the Twenty First Century : Quest for Excellence".

SOME IMPORTANT OBSERVATIONS

The Prime Minister emphasized in his address the following items from the Science and Technology Policy 2003 (presented in the 90th ISC) as the challenges for immediate action : water conservation ; recycling and desalination of sea water for use ; increased affordability and availability of reusable energy ; cure and prevention of infectious and non-infectious diseases ; improvement in the nutritional status of the poor, especially women and children ; effective use of science and technology in agriculture ; diversification of cottage and small scale industries and services in informal sector. He desired the Science Congress to annually review the progress made in implementing this policy and suggest correctives. His message was : pursue excellence, shun shoddiness, encourage public-private partnerships and streamline science administration.

Dr. Murli Manohar Joshi (the then Union Minister for Science & Technology) also put a strong emphasis on the pursuit of excellence. He stressed that for individual excellence to thrive, overall excellence of research and educational institutions is a must. Dr. Joshi recounted the steps already taken to achieve such goals. He urged the State Governments to provide financial support and infrastructure facility to educational institutions to revitalize them. Quoting figures from various Human Development Reports, Dr. Joshi expressed anguish on the socio-economic condition in the

world despite progress in many spheres. He wondered whether the reductionist approach to science was creating a mindset that resulted in the application of science to develop the society in a fragmented manner. He emphasized the need to create a cooperative world and an egalitarian and progressive society. He felt that science needs to train the mind to see and understand the "whole".

Professor Asis Datta, in his Presidential Address high lighted the promises that biotechnology holds for the society in the area of agriculture, nutrition, healthcare and environment. He advocated tapping the strength of India by blending its rich traditional knowledge with the modern science.

The Honourable President of India Dr. A P J Abdul Kalam addressed the gathering in the evening of January 5, 2004. He opened the lecture focusing on the major challenges of providing habitat, food, healthcare, education and employment to the 260 million people in India who are below the poverty line. He called attention to the economists' suggestion that to uplift the people below poverty line, our economy has to grow consistently at the rate of 10% per annum, for over a decade. Dr. Kalam elaborated on the scientific and technological tools that we have and the quality of partnership and innovation that our scientific community can provide for achieving the desired rate of growth.

The Honourable President recounted a number

of technological breakthroughs in space technology, nuclear technology, defense technology, agriculture technology, ICT and cited the setting up of world-class institutions of IITs and IIMs in the country. He emphasized that such breakthroughs can be manifold given the reservoir of knowledge that we have in every academic institute and R & D organization, if all of them aim for technology development to the stage when it is transferred, absorbed and productionised according to the needs of people. He pointed out that for development a country has to market its products in a competitive way to other countries. To succeed in competition, high quality of product, cost effectiveness and supply in time are essential. Scientists and technologists can contribute in making these happen. The fields that he specifically mentioned for such contribution are : agriculture and agro food processing, healthcare and biotechnology, stem cell research, energy production, information and communication technology.

RECOMMENDATIONS

Participants in the 91st Science Congress during their discussions and interactions rendered useful suggestions. The same are presented here.

Excellence in Education

The area that needs attention is the empowerment of young scientists working in the universities and in national institutes. If the corporate world can have young CEOs why should science be far behind? Give freedom to young ones and they will do wonders. This process is closely linked to the training that our students receive at the university level. While several universities provide excellent knowledge base, research training in terms of experimental

skills accompanied by questioning mind is inadequate. This may be nurtured through building research institutes on university campus on one-hand and having exclusive research universities on the other.

An important aspect that is less appreciated is that if one were to depict the number of students in the country enrolled from high school to university to highest doctoral degree, the picture would look rhomboidal. It should look like pyramid, with the top at Ph.D. being more selective and highly competitive. The people at the top of the pyramid should be both capable of questioning and challenging an established system on concrete basis. For achieving this, teachers should be trained to encourage a questioning mind. Teachers need to be confident about their knowledge base and understanding of science to stimulate enquiring minds. Frequent short courses and workshop for continuous up-gradation of the teachers' knowledge base is the need of the day.

-Tap the knowledge base of successful professors, technocrats and technically qualified bureaucrats. Select about 100,000 such people who have retired from their services, honour them as National Teachers. Let them choose or let the schools choose one or two such teachers. These teachers would visit the school three hours per week and transmit the excitement of their field of interest through discussion with the student of 9th and 11th standards, who are not in the immediate race for high percentage scoring. They may identify bright talents, as they are not taxed with the time bound coverage of syllabus or the examination burden. These teachers could play a role model to the students

in various schools and inculcate their knowledge in these youngsters.

-Innovation is not linked to education level, as the National Innovation Foundation has already revealed this starting fact. More such programmes need to be initiated to churn these talents.

Higher Funding for Education

-The education sector needs increased outlay in our budget and in the next five-year plan. This would go a long way to strengthen the infrastructure and provide higher salary to recruit quality teachers in schools, colleges and universities that receive federal funds. As the situation in state government-funded institutions is not healthy, legislation may be introduced that guarantees minimum outlay for education in all our forthcoming state budgets as well.

Role for Women in Scientific Excellence

-A very high priority should be accorded to the participation of women in the search for excellence in science. Only 50% of the female scientific strength of this country is currently tapped while an equal strength wait at the wings. It is seen that girls often out number boys, especially in biosciences, at the university level. A large number of girls reach the Ph.D. level. They lose out in awards and fellowships that are the measures of achievements. The age limit set for many a reward, fellowship and employment, need relaxation where women are concerned because family building, child bearing, and child rearing bring in a time lag in their career. The age limit at present results in under utilization of the trained scientific strength of the country.

Nutrition Security

-The concept of tackling deficiency through iodized salt needs to be applied in tackling malnutrition through iron fortification and protein fortification in agro-produce.

- Develop seeds with high yield capability under dearth of water and land.

- Develop crops with characters like drought and salinity resistance, fungal and viral resistance.

- Develop organic farming and food processing methods. Refine packaging storage and marketing methods. In addition crops with improved nutritional quality need developing. This will add to the nation's competitive advantage, in the short and long terms.

Science and Economic Development

The transition of products and processes from Laboratory to the people requires a close co-operation of the academia and the industries. This is an essential component to reap the fruit of biotechnology and genomics. Funding agencies like the DBT, DST, ICMR, IARI and DRDO have been extensively funding research programmes. However, in this context a concerted and coordinated effort by the funding agencies with a clear road map is required. If the funding agencies shed the partitioning and credit-sharing race among themselves, they would be doing a great help for the scientific and technological development of the country.

The Health Sector and Biotechnology

-Develop drug in the form of vaccines, medicines and develop diagnostics to provide cost effective drug therapy to the one billion Indian as well as to compete in the world market through export.