India Science Report takes shape

Countries worldwide monitor the health of their science and technological activities through 'national science reports'. In India, verbose expositions are made about the health of Indian science, especially with regard to human resource, number of scientific institutions and impact of Indian science on society and national development. The norms for estimating 'health of Indian science' are based on sporadic, outdated and scattered Indian reports, or as is generally the case, use is made of numbers from international data sources. Most of the present R&D statistics generated in India are made for very specific purposes, with no bearing on the overall situation of science in the country. A national science report, such as is envisaged in the *India Science Report* (*ISR*) would help proper decision-making processes over a range of scientific and technological issues. That it is deemed necessary for 'our very own' comprehensive database of Indian science in the public domain has taken ever so long. The idea put together by the Indian National Science Academy (INSA), New Delhi has crystallized into reality. In August 2002, the first meeting of *ISR* was sponsored by INSA with the National Council of Applied Economic Research (NCAER), New Delhi. The NCAER has been given the task of coming up with a feasibility report on *ISR* in six months, at a cost of about Rs 25 lakhs. In its overview of S&T indicators, NCAER states that these indicators serve the purpose of 'assessment of current standing against international benchmarks, evaluation of strengths and weaknesses, to focus on investment effort, and quantifying achievements for setting targets and for motivating growth in a set of postulated indicators of technological level'.

At a workshop on *ISR* organized on 8 April 2003 at INSA, the NCAER research team has laid down the objective of the feasibility study as an answer to the following: 'What would *ISR* cover and how will the S&T activities be measured, validated and monitored?' The activities of *ISR* would be in three phases, each ending with a workshop. These are as follows:

- Conceptualization of *ISR*: purpose, broad parameters and its scope.
- Data inventory.
- Feasibility and prioritization, identification of indicators and preparing the road map.

Broadly, science indicators would cover aspects of the current status of science and technology, determinants of technological change, and the consequences of these changes on economic growth, productivity, employment, international benchmark, etc.

The NCAER has laid out broadly, the following components of the *ISR*:

- Achievements of Indian research institutions includes basic, applied, traditional and industrial.
- Research and Development includes financial, human resource and institutional linkages, and output.
- Technology development and competitiveness includes market for Indian technology, patented inventions, etc.
- Public and private partnership
- Entrepreneurship
- Global reach
- Public attitude and public understanding
- Socio-economic impact includes food and nutrition, environment, health, energy and social security.

During the INSA workshop, several participants expressed their views and concerns about the possible contents of *ISR*. Suman Bery (Director General, NCAER) said the *ISR* would help to show the effectiveness of the scientific activity and spending involved, and stated that what gets measured gets done. K. L. Chopra felt that *ISR* would show the health of Indian science with reliable and quality numbers, and these could then determine 'what ails Indian science'. The knowledge gained from the *ISR* would improve quality of management in the scientific system, with the documentation indicating gaps. Rajesh Kochhar, NISTADS, New Delhi said that there is a need to realize and admit the problem of 'impracticable Government of India sources' predicting different numbers and cautioned about interpreting the data. R. D. Shukla, NCAER, spoke of data issues such as data mining, locating data sources and estimation of indicators linked to the economy. P. V. Indiresan, formerly at IIT, Madras spoke of the inadequacies in data concerning engineering projects and lack of continuous statistics on what happened to engineering graduates once they finished their course. He spoke of an overestimation of the performance of the IITs *vis-à-vis* the sparse knowledge available regarding engineering colleges. He said that the National Accreditation of AICTE was a lost cause. V. Rao Aiyagiri, DST gave an overview of S&T management mechanisms and felt that the *ISR* should portray which scientific models have delivered such as Commissions, Societies or Departments. S. Mohan, NISTADS felt that diploma courses in engineering should be linked to industry. Abhijit Lahiri, NISSAT felt that the *ISR* needed to contain applications of science and its impact on society. S. Arunachalam, MSSRF, Chennai described the various choices of database available, including research output databases and said that the focus should be on maximizing returns on our investment in science and technology. R. Saha, TIFAC, New Delhi felt that the *ISR* should look at different perspectives and assess the efficiency of science in India. For example, elements of extramural funding and timing of release of funds could be scrutinized to see whether the system was working. Output indicators in the form of patents filed and actually commercialized could form part of the *ISR*, he added. Ashok Jain, IIC, New Delhi felt that the use of science and technology for local communities should be a key issue. Also, cautioning that successful technology transfers as written in Government Reports like those of the CSIR were not borne out through his experience of contacting industries for determining what had happened consequent to the stated technology transfer as mentioned in reports.

In conclusion, the *India Science Report* would be the first ever exercise to bring comprehensively all of Indian science and technological activity reports under one roof. Data design for a developing country throws up new challenges due to unique social and economic structures and a suitable set of indicators have to be generated. Data collection, collating and interpreting data are a mammoth exer-

cise. The target for releasing the *India Science Report* has been set for December 2004. While NCAER would provide the necessary statistical methodologies, they would welcome suggestions relating to the contents, etc. from any quarter during this six-month feasibility period, beginning January 2003 for incorporation during the formulation of the *India Science Report*.

Sources:

(1) A Note on S&T Indicator: An Overview, NCAER research team, New Delhi.

(2) *India Science Report*, a feasibility study based on presentations by the NCAER research team.

Nirupa Sen

MEETING REPORT

Altering business models for remaining contemporary and competitive*

A seminar on 'Business models in an era of changing technologies and markets' was held in Hyderabad. Speaking to a mix of engineers, engineer-scientists, CEOs and industrialists, the Chief Minister of Andhra Pradesh, N. Chandrababu Naidu said that the only thing that is permanent in the world is 'change' and this required reshaping business models for profitability and sustenance. He said that Andhra Pradesh (AP) had been promoting engineering graduates and out of every four NRIs, one is from AP. Changing business models also meant the way in which governments did business. He cited an on-line processing time of four minutes for loan applications and obtaining a site for industry in half an hour. With the application of IT in daily government business, registration of properties took fifteen minutes and the introduction of an e-seva and AP on-line portal had reduced corruption, improved transparency and saved time, he added.

In his keynote address S. Ramadorai, CEO, Tata Consultancy Services (TCS) said that the Indian industry had grown by 35% in the last three years. In the TCS journey, he said that it had been necessary for building credibility with changes made on the technology front and inventing new business models for survival. This was especially true in the IT industry and software services that had to learn to adapt and survive, with business volumes expected to grow to 40 billion US dollars. Business models had to keep track-records going and inculcate an ability to obsolete products. This meant integrating new technology, generating customer value, reducing waste, increasing transparency and eliminating bottlenecks. TCS had risen to the era of changing technologies and markets by establishing laboratories in Hyderabad and Pune with the motto 'survival is the name of the game, believe in it and prepare for the future'.

The session on 'Service industry: Getting closer to the end customer' had speakers from Thomas Cook (Ashwini Kakkar), Unit Trust of India (B. S. Pandit), and McKinsey and Co. (Pramath Sinha). With the service industry mainly dependent on outsourcing partners, time was replacing cash as the most precious commodity and there was a critical need for future proofing organizations in an increasingly chaotic world. For this service industry, business models had to incorporate a customer-centric approach, and generate ideas through teamwork (a weak point for Indians, it was cited), remembering that long-term goals were in fact a summation over several short-term goals. This would involve business process re-engineering (BPR), concept of fair profit and passing on the value of innovation to the customer. In fact, it was cited that a combination of BPR, change of emphasis from back office operations to customer focus and putting in place a centralized database that handled data of about 28 million unit holders had been part of Unit Trust of India's initiatives since 1999. Pramath Sinha said that industry leaders worldwide are leveraging IT to achieve market dominance, though it was difficult to find a correlation between IT spending and profitability gains.

Panellists in the session on 'A profitable public sector: Myth or reality' were from BHEL, ECIL, British Gas India and Tata Services. It was shown that despite the public sector having to face severe criticism for dismal performance, 'it' had mostly survived. The role of the public sector, it was stated, was to serve as a nerve centre of development in India and to provide for hard times that the country had to face during intermittent technology-denial periods. The greatest asset to the country was the public sector acting as a buffer for building immunity to denials. Successful public-sector undertakings (PSUs) such as ECIL had transformed, without being doled out prescriptions on how to change, by working out a strategy based on appropriate technology and co-operative management. The Indian Oil Corporation had faced the crisis by inculcating the latest technology. GAIL had adapted to the environment and made business profitable, especially after laying the LPG pipeline between Jamnagar and New Delhi. There was however a word of caution from C.K. Sharma, Department of Public Enterprise, Uttar Pradesh that the reply often heard when he enquired about absenteeism of erring employees in PSUs, of the employee not being available in the forenoon and not working in the afternoon had to change. PSUs had

*A report on the seminar on 'Business models in an era of changing technologies and markets' coinciding with the Fifth Annual Function of the Indian National Academy of Engineering (INAE), jointly hosted by Tata Consultancy Services and INAE, in Hyderabad during 16–17 December 2002.