Higher Education in Science & Research and International Collaboration- Challenges in the Indian Context

Dr. Namrata Pathak
CEMDE, University of Delhi, INDIA

Higher Education in Science/ Research in INDIA - On a decline???
The tradition of science in India, of course, extends back millennia, with Aryabhatta, Bhaskara, Brahmagupta, and others still celebrated for their foundational contributions to the fields of mathematics, astronomy, and chemistry. In the modern era, science and technology have been central to India’s development efforts since the nation achieved independence in 1947. Recent years have seen a growing realization among scholars, policymakers, and other observers that India lags behind other key countries and some of its BRIC partners in research investment and output. Funding for education and research has been a priority and has risen accordingly. The latest Eleventh five-year plan, (2007 to 2012) includes a four-fold increase for education over the previous plan. Overall, as Nature reported earlier in 2009, government spending on science research currently accounts for roughly 0.9% of gross domestic product; by 2012, the figure is expected to rise to 1.2%.

Some of the Challenges that the country face today are:

- Last year, the government disclosed disturbing figures about the dwindling number of scientists in ISRO, Department of Atomic Energy (DAE) and Defense Research Development Organisation (DRDO). This high level of attrition has been attributed to the remunerative packages offered by the IT, communications , the corporate world and abroad.
- Talent crisis/ poor standards/ shrinking resources - A current lack of human resources i.e. the availability of qualified researchers has not kept pace with the increased funding / poor infrastructure support
- Indian science has suffered a lot from an inward-looking crab mentality, a reluctance to share infrastructure, a disregard for scientific ethics, and the lack of a new generation of science leaders. Synergy and collaboration must be promoted between national institutes and centres of excellence in the universities, free from bureaucratic obstacles
- Taking into account the billion plus population, the population-institute ratio is close to NIL
- Excessive pressure on scientists to generate income for their labs has forced researchers to deviate from their core competence to cater to the requirements of funding agencies
Mass opening of sub-standard engineering/ medical colleges and private universities, where for admissions merit is not the criteria but donation and politics is.

Absence of enough job opportunities - increasing number of educated unemployed mass

Level of critical thinking, independent thinking and practical skills are almost nil in today's education system

Over—centralization and lack of autonomy and accountability

A Wide gap between teaching and research in our education system

Financial incentives/ salaries are not competitive

**International Collaborations**

A new approach (in the XI th Five Year Plan of Government of India, Planning Commission, 2006), has been suggested for international collaborative programmes to ensure that national priorities are taken care of. The International Collaboration Inputs and activities should be leveraged primarily aiming at complementing and supplementing ongoing national efforts in selected areas of basic research. New initiatives aiming at developing and implementing mega S&T projects both in areas of basic sciences and other areas of need including societal needs also should be given due importance and priority. International collaboration inputs should also be effectively used in developing world class facilities in selected areas in the country as well as for India’s participation in major International S&T mega projects/initiatives.

**To ponder over emerging issues as thrown upon by various authors/ contributors:**

- The most appropriate level for the collaboration (for example, between countries, between institutions or between individuals)?
- Experiences suggest that Initiatives between developing countries remain critically under-funded, and often fail to go beyond mere political slogans.
- A survey result (AUCC’s 2006) demonstrated that there are some barriers to faculty engagement in research collaboration with developing country partners, including lack of funding, lack of institutional recognition of faculty members’ efforts, the absence of a coherent government policy framework expressly in support of research collaboration for development, competition with domestic research priorities, and a lack of internal institutional support.
- Whether these collaborations will produce new centers of excellence while leading to creating capacity building for research in developing countries or just more research relevant to developing countries?
- Assessing / measuring impacts of International S & T collaboration, in order to evaluate its effectiveness
- International collaboration leading to Brain-drain or brain-sharing??
- Cultural Diversity/ attitudes/ Communication barriers- inhibiting factors in scientific exchange/ co-operation?
- Commercialization & commodification of higher education- placing undue importance on economic benefits than on academic & scientific contribution of higher education in society
- Risks associated with various kinds of rogue providers and diploma mills
- Quality assurance and accreditation (i.e. standards of education & benchmarking) along with recognition of qualifications and credits

References:
Sachi Hatakenaka, “New Developments in International Research Collaboration” (www.bc.edu/bc_org/avp/soe/cihe/newsletter/Number50/p11_Hatakenaka.htm)
U. C. Lavania, Five-point plan to revive and reform Indian science, Nature 445, 484 (1 February 2007) I doi:10.1038/445484c; Published online 31 January 2007 http://www.nature.com/nature/journal/v445/n7127/full/445484c.html

E.mail- pathak.namrata@gmail.com, namratapathak@hotmail.com
Tel: 0901-120-2320339, 0901-9818819941

Experience Summary—More than a decade’s experience of Research and development in natural Resources management (esp. WATER sector). A Post Doctoral Fellow from University of Siegen with specialization in Biochemistry. Possess doctorate in Environment and Biomass from Indian Institute of Technology, New Delhi. Have been recipient of many honors/awards e.g. Community service award instituted by Indian Institute of Technology, New Delhi was in recognition of display of sensitivity to social problems. Have been a guest lecturer at the international organizations and been an invited Guest Professor at Maria Goeppert Program, Department of Water Quality and Waste Management at the University of Hannover, Germany. Won the bid to hold an International conference on Rain Water Catchment System. Was one of the 13 women selected for an exhibition project “Departure-Arrival” of the Department of Science and Culture of the state government of Lower Saxony, Germany. Also life member of Water Supply and Sanitation and Collaborative council (WSSCC), Geneva, Switzerland. Undertaken numerous consultancy assignments for WHO-SEARO. Supervised more than 35 Post Graduate Diploma students (Rural Development stream-IGNOU) in their respective projects. Possess numerous publications (books/journals of repute), conferences, invited lectures etc. to credit.