

**Report of the
Task Force for Basic Scientific Research
in Universities**

May, 2005

**Set up by
Ministry of Human Resource Development
Department of Secondary & Higher Education
Government of India, New Delhi**

Rejuvenation of Basic scientific Research in Indian Universities

Introduction:

Science and Technology have played a very decisive role in the overall development of mankind. Scientific knowledge has led to remarkable innovations that have been of great benefit to humankind. Rapid advancements in science and technology have brought the subject to a centre-stage. The global scientific knowledge and information are increasing at a very fast rate. The doubling time of knowledge has drastically reduced from decades to years and from years to a few months. The economic growth critically hinges on inputs from science & technology of the highest kind and this gets linked to the doctoral programme in Universities. If India has to be a formidable force in the emerging knowledge regime, it is imperative that our Universities are at the vanguard of this transition. Quality sustenance and quality improvement of science research in the University system have to be reflected as per international standards by significant increase of publications in peer-reviewed journals of good impact factor, by patents and by technology transfer activities.

The quality and quantum of scientific research in India have been declining over the years due to inadequate infrastructure facilities, insufficient funding of research activities and particularly lack of sufficient number of committed scientific work force. Our Universities and laboratories have thus failed to respond to the needs of time. The consequences are clearly visible in the system. The enrolment in Basic Sciences over the years has declined. Our research laboratories do not get adequate number of competent personnel at the lower as well as at the higher level. Besides, there is an acute shortage of qualified teachers in Basic Sciences, engineering, technology and medicine. The problem has actually assumed serious proportions and requires radical measures at the highest policy level.

Having regard to the above, the Government of India, Ministry of Human resource Development (MHRD), Department of Secondary and Higher Education vide

its order No. 18-15/2005-UIA dated 22nd March, 2005 set up a Task force for Basic Scientific Research in Universities with the following composition:

1. Prof. M.M. Sharma	Chairman
2. Prof. G. Mehta	Member
3. Prof. Kota Harinarayana	Member
4. Prof. S.P. Thyagarajan	Member
5. Prof. P. Rama Rao	Member
6. Prof. Ved Prakash	Convenor

The Terms of References (TORs) of the Task Force are:

- i. To make an assessment of the present status of scientific research and training in Universities and to determine the areas of concern.
- ii. To suggest solutions and strategies to retrieve and enhance the excellence of Universities in the area of scientific research and training.
- iii. To make an assessment of the resources required both in physical and financial terms to implement the solutions and its modalities.

Approach to the Task:

The Task Force had held several rounds of discussion besides interacting with various members of the scientific community. An exclusive interactive session was held with Prof. C.N.R. Rao. The committee also had a special interactive session with Shri Sudeep Banerjee, Additional Secretary, MHRD. The Task force also considered suggestions/comments received from scientists from all over India. The Task Force also collected information from University departments which have been supported by UGC under Special Assistance Programme (SAP) and through Science and Engineering Research Council (SERC) and Fund for Infrastructure Strengthening in Science and Technology (FIST) programmes of the Department of Science and Technology (DST).

The following documents were also considered by the Committee while formulating its recommendations:

- a) A background note highlighting UGC's programmes for the promotion of research.
- b) Draft report of UGC sub-committee on National Policy on Education Strengthening of Research.
- c) Synopsis of performance responses received from the UGC-SAP Department.
- d) Department/Institutions funded by DST.

Areas of Concern:

The Universities, the world over, and so also in India sometime ago, have been the traditional home of research. As long as this time-tested tradition is nurtured assiduously by a nation its future well being is assured. Unfortunately, we are not in a position to say today that this healthy situation exists in our country. It is this dismal position that demands urgent action and such action can be only taken as highest policy intervention of the government. This will inevitably require expeditious decisions on funding for infrastructure besides nurturing research ambience, induction of motivated young faculty and attracting meritorious students for research.

Science research should be made the key activity of the Universities with greater emphasis on research leading to Ph.D degree without which quality teaching is not sustainable. Access to scientific research journals and related resources must be strengthened and its scope should be widened through Information and Communication Technology (ICT).

Science research should mean research in Basic Sciences, engineering, medicine and applied interdisciplinary sciences. The system needs to be made more flexible to strengthen research in interdisciplinary needs.

After extensive deliberations and making an assessment of present status of scientific research and training in Universities and determining the areas of concern, the committee made the following recommendations.

Recommendations:

1. There are a large number of sanctioned faculty positions in Universities that have been lying vacant for a prolonged period. These positions should be expeditiously filled in by inducting talented faculty with a view to strengthening the research base.
2. 1000 positions of Research Scientists at various levels equivalent to that of Lecturer, Reader and Professor need to be created. These positions may be filled in through a rigorous selection procedure in a phased manner over a period of five years. Performance of these scientists be reviewed after every five years by a duly constituted expert committee. In order to ensure enabling environment on a continuous basis for these prospective scientists, an MoU should be signed between the state Universities and the implementing agency.
3. There is a need to create 10 networking centres in Basic Sciences (two centres each in Physical Sciences, chemical Sciences, Life Sciences, Material Sciences and Mathematical Sciences) in leading Departments of Universities in different parts of the country to promote collaborative research, access to advanced facilities and imparting training in frontier areas. These centres should be supported on a long term basis in a substantial manner to enable them to realize internationally competitive status.
4. Formal linkage between the Universities and national level institutions including CSIR laboratories be promoted through joint research project and training. Linkages of Universities and their faculty with industries and user organizations should be encouraged. There should be a provision for joint appointments/visiting professorship to stimulate collaborative research.
5. The system of both Winter and Summer Schools must be supported. Each subject area of Basic Sciences may offer upto ten programmes a year. There should be a provision for visiting Fellowships for faculty within the country.

6. In order to promote quality scientific research in Universities, infrastructural facilities ought to be upgraded by providing development grants for modern laboratories, physical infrastructure including uninterrupted power supply, water, safety requirements of international standards, high level equipment with built-in maintenance mechanism, exclusive research students' hostel and a research starter fund etc.
7. The number of Ph.Ds from Indian Universities should increase five-fold within a span of ten years with proper standards. This should be seen in the context of extremely low fraction of Ph.Ds in India in relation to M.Sc/B.Tech., as compared to what it is in USA, UK, Germany, Japan etc. The emphasis for research will clearly emerge if we have Universities with only departments and separately Universities having affiliated colleges.
8. An empowered autonomous body headed by an eminent scientist/academician with an Advisory Board comprising scientists and engineers shall be set up by the UGC for the purpose of implementing the aforesaid initiatives.
9. The Ministry of Human Resource Development should provide earmarked grants of Rs. 600 crores per annum for implementation of the programme of improving scientific research in Universities. This earmarked grant may be utilized for the following activities:

Sl. No.	Activities	Budget (Rs. in Crores p.a)
1.	Support for infrastructure development in Universities	400
2.	Setting up of 10 Centres in Basic Sciences	150
3.	Recurrent grants for Research Scientists	10
4.	Research Fellowships and Post-Doctoral Fellowships	5
5.	Winter and Summer Schools and Linkage Programmes	20
6.	Establishment cost of implementing Agency	15
Grand Total		600

10. Facilitating Recommendations:

- a) The eligibility qualifications for a Lecturer in the University Science Departments should be Ph.D. However, in the departments of engineering and medicine, initially a lecturer may be appointed with M.Tech./MD or MS qualifications respectively with the stipulation of acquiring Ph.D within 7 (seven) years of appointment.
- b) Teachers guiding research scholars should be given credit in terms of their work load. For every research scholar, the teacher should be credited 2 (two) hours pr week in the prescribed work load.
- c) The age of retirement of University teachers must be uniform all over the country.
- d) Women participation in basic science research be enhanced by way of removing age bar and introducing flexi-time approach.
- e) Five-year integrated M.Sc programmes for higher secondary students and Integrated Ph.D programmes for graduates should be introduced in select central and state Universities.
- f) All post-graduate programmes pertaining to science and technology should have an inbuilt component of research.
- g) The present system of National Eligibility test (NET) for determining the eligibility for Lecturer and for award of Research Fellowships ought to be revisited with a view to bringing about qualitative improvement in the selection procedure.
- h) In addition to Research Fellowship awarded by different National Funding Agencies, every University shall be provided, for pursuing Doctoral research. 50 (fifty) fellowships in Basic Sciences based on past performance of Departments. Post-doctoral Fellowships should be introduced for a maximum period of two years on a highly selective basis.
- i) All UGC-SAP Departments, DST-FIST Departments and the research centres funded by national agencies should be conferred complete autonomy with academic, administrative and financial powers. The Acts of the State Universities may have to be revisited to bring about necessary amendments to this effect.

j) Every institution of higher learning should earmark 5% of its non-plan budget for the furtherance of research in Basic Sciences. 10% of the capital grant allocated to each University should be provided as annual maintenance grants towards spare part, annual maintenance contracts, some add-on facilities and repairs, etc. The overhead charges provided to the Universities should be made uniform at 15%.