Higher Education, Science and Technology: Imperatives for Socio-Economic Development

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After my appointment as Minister of Science & Technology in 2000 and later Federal Minister/Chairman Higher Education Commission in 2002, I persuaded the government to give a 6000% increase in the budget of science & technology and 2400% increase in the budget of higher education. This allowed us to launch major self-funded programmes to uplift our universities, develop high level S&T manpower and focus on the triple challenges of access, quality and relevance in higher education. Pakistan has made remarkable progress during the period 2003-2010 in higher education which has directly impacted scientific research. The increase in scientific research output is nothing short of spectacular—600 per cent increase in scientific publications in international journals and a similar increase in citations in the same period, after decades of stagnation. About 5,000 Ph.D. level scholarships were awarded for study in technologically advanced countries (largest programme ever in the developing world) with about 10 million rupees being spent on each student. Some 3,000 indigenous Ph.D. scholarships were also awarded. A Digital Library was established in Pakistan which is regarded as one of the best digital libraries anywhere in the world: Every student in every public sector university today has access to 45,000 textbooks and research monographs from 220 international publishers as well as to 25,000 international research journals completely free of charge. University enrolment has tripled—it had reached to only 270,000 during the 56-year period from 1947 to 2003 but in the subsequent seven-year period from 2004 to 2010, it increased to about 810,000. There were only 59 universities and degree awarding institutes in the year 2001 in Pakistan. These grew to 137 such institutions by 2010. Pakistan has won four prestigious international awards in recognition of the rapid transformation in the higher education sector [1].

We have investigated several hundred terrestrial and marine plants for their chemical and biological significance and isolated and identified over 2000 compounds of which some 600 turned out to be new and novel constituents with interesting biological activity profiles. In order to optimize the chances of finding novel leads, extensive primary biological screenings and activity-guided fractionation and purification were carried out. State-of-the-art spectroscopic techniques, especially modern multi-dimensional NMR techniques, were utilized to elucidate the structures of bioactive natural molecules, rapidly and accurately. A selection of these results illustrated by their potential application to treat diseases such as epilepsy will be presented.

REFERENCES