Reforms and funds crucial to enhance higher education and research in universities

The state of higher education, research and scientific output in India's universities has been discussed in several articles in *Current Science*[1,2], which we read with interest. We would like to make a few suggestions on this subject.

We had opportunities to review doctoral dissertations from India recently, and were impressed by the quality of research done in the field of biological sciences. It was obvious from the dissertations that students had little or no research funds, and yet completed their work satisfactorily. The dissertations were accompanied by abstracts of presentations at national conferences, which indicated that students discussed their findings in a few scientific fora. However, there was lack of peer-reviewed publications in journals resulting from the work. In Taiwan, highly competitive universities require doctoral candidates to publish one or two peer-reviewed publications in international journals listed in science, social science or arts and humanities (*SCI*, *SSCI*, and *AHCI*) databases before graduation. This policy works well and it pushes students and supervisors to work together to complete their research through publications. Unpublished dissertations usually end up in local university libraries and often out of reach of researchers, both in India and overseas. Besides, universities in Taiwan encourage staff to publish their research by offering awards annually. This can also be followed in India. If teachers are presented even with small monetary awards for publication as an incentive of recognition, it will motivate them to carry out research and publish papers in peer-reviewed journals.

Recruitment of overseas students is also beneficial for universities. The number of overseas Chinese students studying at universities in Taiwan has exceeded 10,000, since the government initiated a programme in 1999 to boost recruitment of ethnic Chinese students abroad. We do have several ethnic Chinese students from India studying at our universities. Similarly, ethnic Indians who live in different parts of the world can be attracted to India's universities, if there are special programmes to encourage them to benefit from the unique educational and research potential available in the Indian academia. Ultimately, they will contribute to the progress of research in India.

Although Taiwan qualifies as the 17th economy in the world with a population of 23 million, upgrading higher education started just a decade ago. The public and private funds spent on higher education increased from USD 3.82 billion in 2000 to USD 6.08 in 2002, while funds available per student rose from USD 3530 to USD 5000 during the same period[3]. Both public and private universities in India have to strengthen their fund-raising capabilities by approaching interest groups such as business enterprises, alumni associations, etc. When the new University Act was promulgated in 1994 in Taiwan, the government allowed colleges and universities to become more autonomous. The number of higher education institutions has rapidly grown from 140 in 1994 to 168 in 2003, representing a 20% increase[3], which is comparable to the effect of mushrooming of self-financed educational institutions in India[4]. The government has realized now that quality is more important than quantity, and is attempting to merge universities to strengthen eminence and competitiveness in higher education and research.

When UNESCO organized the First World Conference on Higher Education in 1998, 182 member countries participated in the conference. It was agreed at the conference that higher education should be given one of the highest national priorities[5]. The overall spending for higher education in India is 3.2% of its GDP, which is lower than the average 3.8% of GDP for developing countries. Funding is the bottom-line for scientific growth and it is crucial for India to prioritize financial backing, both public and private, for higher education and research in universities, if tangible results are to be achieved in terms of scientific output.

1. Balaram, P., *Curr. Sci.*, 2004, **87**, 273–274.
2. Prathap, G., *Curr. Sci.*, 2004, **87**, 732–734.
3. Ministry of Education, Republic of China Report, 2003.
4. Amatussalam A., *Curr. Sci.*, 2004, **87**, 726.
5. UNESCO World Conference on Higher Education, Working and background Documents, UNESCO, Paris, 5–9 October 1998.

GOVINDASAMY AGORAMOORTHY[1]
MINNA J. HSU[2,*]

[1]*Tajen Institute of Technology,*
Yanpu, Pingtung 907,
Taiwan
[2]*Department of Biological Sciences,*
National Sun Yat-sen University,
Kaohsiung 804,
Taiwan
**For correspondence.*
e-mail: hsumin@mail.nsysu.edu.tw

Need for periodic assessment of botanical wealth

I have been teaching botany for the last 20 years at a college. As a part of the curriculum and also due to personal interest in studying biodiversity, I regularly go for excursions to various, not exactly remote but undisturbed pockets in the ranges and their lateral side-shoots of Western Ghats (WG) entering into Satara district. I wish to share my experience with the readers of *Current Science*.

Many conservationalists have prepared lists of rare, endangered, threatened and endemic plants of Maharashtra from the ranges of WG. This information is also available in the volumes of *Red Data Book of Indian Plants*. But during my visits to undisturbed pockets of the WG from this district, I have come across a sizeable

population of some of these listed plants. To cite a few examples I have observed the species: *Abutilon ranadei*, *Aponogeton satarensis*, *Dipcadi ursulae*, *Kalanchoe olivacea*, *Oianthus urceolatus*, *Urgenia congesta*, *Delphinium malabaricum*, etc.

The literature referred in preparing such lists is some 5–20 years old. Nature being dynamic, many changes have taken place in these 20 years. Thus a plant which was rare, endangered and endemic some 20 years ago might have re-established itself again in some other habitat.

There is a need for a fresh check-list by re-exploring various natural habitats. Central and State Government organizations, various funding agencies, students of branches of botany at universities and colleges should contribute in this exploration of the botanical wealth of our country. This basic work is needed in the conservation strategy of our biodiversity. Without this fundamental knowledge we cannot plan conservation of our plants.

B. A. KORE

Department of Botany,
Yashwantrao Chavan Institute of Science,
Satara 415 001, India

River linking project: Case-specific approach is needed

This has the reference to the write up[1] on the proposed river linking project. It is, in fact, in tune with the so-called widely accepted 'development approach', a way of achieving socio-economic development adopting scientific methods to solve a variety of problems, especially in countries like India. The ever-increasing water shortage problem of the country can be solved only by such a mammoth project. Several other experts too share the same opinion, with a caution that the project should be implemented by taking all environmental safeguard mechanisms into consideration[2].

However, most of the experts across the spectrum of specialization, as also mentioned by Biyani and Gupta, are of the opinion that such a project is not feasible on many counts[3]. Those conclusions are drawn mainly on technical, geological, environmental, economical and social grounds. Serious doubts are also expressed on the efficiency of water sharing by different user communities in future, considering the complex nature of Indian political economy. The broad trend of this debate, set over last three years has certainly indicated that there are more people who oppose it than those who support it. Several alternatives, like rain water harvesting and watershed development, are also suggested as solutions for this ever-increasing water scarcity scenario.

The discussion, however, has taken place mainly at conceptual level so far. The entire debate generated across the country has taken the proposals of the government, as if it is a single project. There is need for assessing these projects by looking at different river-linking schemes separately. Such a case-specific study alone could reveal the real and concrete picture over the impact of the different schemes. That approach would also help us to guide the policy framing process, which could take care of both environmental security and the remedy for acute water shortage problems. Efforts can be made to quantify the costs and benefits, both short and long-term, under the light of such field-specific studies. This strategy can also integrate both the traditional methods like rain water harvesting and engineering methods like river linking efforts to meet demand for water.

'Western Ghats' component of the proposed river linking project in peninsular India is the case in point. The ecological significance of this hilly terrain region spread parallel to the west coast with its unique flora and fauna is recognized as one of the 'Biodiversity hot spots' in the world. In this 'Sahyadri' region of Karnataka, for instance, the river linking project proposes to divert two major west-flowing rivers to the eastern direction in order to link and augment the flow in east-flowing rivers. They are namely. 'Bedthi river to Tungabhadra' and 'Netravati to Hemavati river'. There is a need for looking at these proposed projects in the Western Ghats region, with a different perspective, which may not necessarily be relevant to other areas. Biodiversity loss, for example, by any such construction-intensive projects would be beyond comprehension in this region as compared to that in the plains. The unique riparian ecology, higher evaporation rate of surface water bodies due to tropical conditions, lower water retention capacity of the laterite soil, seismologically sensitive southern Indian plate, high endemism of flora and fauna, etc., are already shown to be constraints for such projects in this region. The reduction in natural flow of original stream is also shown to be jeopardizing the downstream ecology, specially in the coastal region. The studies have shown that it may harm the ecological and livelihood security of the region by creating conditions like fish famine. The proposed schemes mentioned above would also cause a huge socio-economic loss. This component, thus, needs special treatment while assessing its impact.

The different schemes, therefore, proposed in this mega river linking project, need to be treated with such micro-analysis approach while understanding the overall costs and benefits. Otherwise, the entire debate may end up in one or the other of extreme decisions (pro or against), which would serve no real purpose.

1. Biyani, A. K. and Gupta, S. K., *Curr. Sci.*, 2004, **87**, 277–278.
2. Murthy, T. V. V. G. R. K., *J. Geol. Soc. India*, 2003, **62**, 380.
3. Radhakrishna, B. P., *Curr. Sci.*, 2003, **84**, 1390–1394.

KESHAVA H. KORSE

Department of Pharmacognosy
(Medicinal Botany),
S.D.M. College,
Ujire 574 240, India
e-mail: kekorse@yahoo.co.in