

Ethics in science

On reading Rajappa's letter about ethics in science¹, I was reminded of a publication on Sir Christopher Ingold that appeared in *Chemistry in Britain*².

It said that on one occasion the noted organic chemist H. C. Brown lectured in the anatomy theatre at University College, London and showed a slide in which several points lay well off the straight line. Brown said, 'Since this slide was made, my students have re-examined the errant points and I am happy to report that all now lie close to this line'. During question time, Ingold who was in the audience asked, 'Professor

Brown, I am delighted that the points which fell off the line proved, on reinvestigation to be in compliance. I wonder however, if you had your students reinvestigate all those points which fell on the line to find out how many no longer do so'. For once Brown was speechless. However, his chance came a little later as Ingold was accompanying him from the lecture theatre past a series of skeletons in a glass case. Brown turned to Ingold and said, 'Your former colloquium speakers, I presume?'

Though Ingold's remarks in this case were probably in a lighter vein, it is not too

uncommon, as Rajappa puts it, 'to nudge the values to fall within limits'.

1. Rajappa, A., *Curr. Sci.*, 2005, **88**, 1023–1024.
2. Maccoll, A., *Chem. Br.*, 1993.

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Reinventing Indian universities

The editorial 'Reinventing our universities'¹ has clearly pointed out the decline in the state universities. I totally agree with the views expressed by the editor. If there is a mediocre person at the highest position in the universities then the system would be polluted. Vice-Chancellor (VC) from IAS, IPS and allied services, politicians, military persons, etc. cannot make good academics. When such persons are appointed in the university system as managers, the whole system collapses. Many state universities have been reduced to the level of high schools. These institutions only cater to admission, examination, revaluation, re-examination, and distribution of degrees. They do not care much about teaching and research.

It is true that the backbone of the university is the qualified faculty as envisaged

by the editor, but faculty members shirk responsibility, once they attain higher positions (professorship). Some professors also take up administrative jobs to get closer to the VC and gain illegal advantages. The appointment of VCs is for a limited period (3–5 yrs), while faculty members remain for at least 25–30 years, hence the latter have a big role in shaping the university.

It seems that the Central Government has now understood the importance of higher education in the country, after 58 years of independence. It has realized that the investments in institutions of higher education, and research and development organization is important.

It is suggested that every year during June/July, a report card of the universities should be analysed by the UGC or other

scientific organizations, by formation of a committee consisting of an academican, administrator, and one outside expert from developed countries. On the basis of the report card, grants should be allotted for the next year. Universities which excel should be given more grants as a bonus/reward/incentive.

There is an urgent need to correct the higher education system in India before it is too late.

1. Balaram, P., *Curr. Sci.*, 2005, **88**, 529–530.

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University system

The commentary on overhauling the university system by Lakhota¹ makes interesting reading. Kudos to the author who has reflected the feelings and views of many in India. What remains to be seen is whether or not the message reaches out to the powers

that be and the people who are expected to change their attitudes and mend their ways.

1. Lakhota, S. C., *Curr. Sci.*, 2005, **88**, 1731–1735.

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GM rice and China

Here is another report¹ for our activists to desperately try and disprove the claims! In a pre-production trial (a step before commercialization), two rice varieties, one

GM Xianyou 63, with *Bt* gene to protect against rice stem borer and leaf roller, and another GMII–Youming 86 with cowpea trypsin inhibitor gene to protect against

rice stem borer, were tested by Chinese farmers in their fields. The *Bt* gene was generated by Chinese scientists. GM rice seeds were distributed at the same cost as

non-GM rice. No other subsidies were provided. Those who planted GM rice in their entire field were termed full adopters and those who planted in part of their fields were termed as partial adopters. Between 2002 and 2003, a total of 109 adopters (full + partial) and 69 non-adopters were randomly included in the survey. These were from six of the eight sample villages, and a total of 146 households were interviewed. In total, the survey obtained data from 347 rice production plots: 123 plots with GM rice and 224 plots with non-GM-rice. Regression analysis for pesticide use was carried out with GM rice varieties used, pesticide price, weather effects, year effects, producer and farm characteristics as variable parameters. The results indicate that cultivation of both GM varieties leads to a reduction in pesticide use by around 80%, which works out to 16.77 kg/ha. There is a narrower difference in terms of yield, the GM rice giving 6% higher yield than non-GM varieties. Household

surveys indicated that full adopters did not report of any pesticide-related health setbacks. The partial adopters did not show any health benefits over the non-adopters.

I wonder whether we should be waiting for all the Chinese experiments to prove the benefits and safety of GM rice for pest resistance. We do have indigenous *Bt* genes. Despite all the efforts to stall, *Bt* cotton is in the field. Why is ICAR not taking the lead? It can form a consortium enabling public-private partnerships to help scientists in India take their products to the field for evaluation and commercialization. How long should we be bogged down by the same and tiring repetitive arguments on environment and individual safety? Procrastination can only lead to illicit GM rice getting into the field, just as it happened in the case of cotton. Who knows, China may be working on GM indica variety for export purposes! If *Bt* gene itself is taking so much time to reach the field, I do not know how long it will take to exploit

genes that have a bearing on improving nutrition or protecting against abiotic stresses. We owe it to the nation to usher in strategies for better farming and better health, beyond the pesticide lobby. We are at least 5 years behind China before any of our indigenous GM rice can reach the preproduction trial stage – that is, if ever these efforts are allowed to see the light of the day. We can challenge the MNCs only by aggressively encouraging indigenous R&D and commercialization.

1. Huang, J., Hu, R., Rozelle, S. and Pray, C., *Science*, 2005, **308**, 688–690.

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Kabi sacred grove of North Sikkim

Sacred groves are small patches of forests conserved through man's spiritual belief and faith. In India, 13,720 sacred groves have been enumerated from 19 states. Kerala, Maharashtra, Andhra Pradesh and Tamil Nadu have the maximum number of sacred groves¹. They are rich in rare and endemic species of plants and represent a tradition of conservation, management and even sustainable development of natural resources². In the NE regions, sacred groves are found in Assam, Meghalaya, Arunachal Pradesh, Manipur and Sikkim³. However, a systematic approach in the study of such sacred groves is lacking.

In Sikkim, sacred groves have been reported from all the four districts. All the sacred groves are attached to the local monasteries (Gumpas), dedicated to the deities and managed by the Gumpa authority or Lamas, or often by the village community. Out of 35 sacred groves found in Sikkim, 24 are terrestrial and 11 are aquatic sacred lakes or water bodies. The Kabi sacred grove of North Sikkim is the largest and has special historic importance. This grove is situated about 22 km north of Gangtok along the Gangtok–Chungthang BRO highway, at an elevation of 1950 m mean sea level. The grove occupies about 3 km² of area and is bounded by households and degraded forests.

A detailed study was conducted in the Kabi sacred grove to evaluate the floristic composition of the grove, access common threats to it and provide a strategy and action plan for conservation of the existing plant diversity of the grove. Analysis of plant diversity available within the boundary of the sacred grove revealed altogether 241 species. The species come under 183 genera and 84 families. The Pteridophytic flora comprise of 13 families, 21 genera and 30 species and the Angiospermic flora represents 70 families, 161 genera and 210 species, while gymnosperms are represented by a solitary species, *Cryptomeria japonica* (L.f.) D. Don. There are 44 species of trees, 26 species of shrubs, 91 species of herbs, 21 species of climbers, 13 species of grasses and 16 species of epiphytes. Analysis of the floristic composition of biodiversity of the sacred grove revealed that there are eight sacred plants, 11 plants or plant products that were edible, eight plants used as firewood, 16 types of plants having timber value, and 41 medicinal plants.

The present status of the grove is of concern, as it is gradually declining under constant anthropogenic pressure. Spiritual sentiments of the people are attached with the erected stones (stones of brotherhood)³, but not with the plant diversity of the area. This exposes the biodiversity for exploita-

tion. People's rural appraisal (PRA) study revealed that different non-timber forest products (NTFPs) are being collected often by the local people. Due to the fast-changing society framework and mindset of the younger generation, the spiritual concept behind the grove has been diluted. Moreover, activities inside the grove are restricted to some auspicious occasions once or twice a year; otherwise it remains nothing more than a neglected forest patch. The PRA study inferred that about 20% of the area was encroached for cultivation during 1970–90 and about 10% of the forest cover degraded due to clearing of large fallen trees for house construction as well as for fuel. Recently, construction of concrete footpath and a shrine further exposed the grove for degradation.

It is clear that this sacred grove cannot be preserved based only on spiritual belief. There is an urgent need to implement rural participatory management practices by the state government, with the help of the existing village community and forest committees. The area adjacent to the grove may be developed as supply reserve forest, which can supply the biomass need of the people. In turn, it would also reduce anthropogenic pressure on the sacred grove. A small task force constituted by taking help from the local community, may be