

Pros and cons of a non-resident Indian

In general there is a negative attitude towards the non-resident Indians (NRIs). One such example is the uproar made before the appointment of TIFR Mumbai's director¹. Another example we find is in the September issue of *Current Science*². According to Joshi's letter, everything which originated or originates from the West is bad. He criticizes all systems including the political at one end to education system at the other end, without offering alternative models.

So far as democracy is concerned, it is not necessarily a Western product. Though its origin is believed to be Greek, recent studies show that its roots were in ancient India (see www.nipissingu.ca/departement/history/muhlberger/histdem/indiandem.htm, 23 September 2003, pp. 1–16). Already between 324 and 322 BC Patliputra (today's Patna) had the traditional *panchayat*, that is, a five-member council of elders that governed villages, towns and cities³.

For Joshi if someone permanently leaves India: 'This simply means that the feeling of nationalism is not as strong as some of us would like to believe.'² We do not have a scale to measure 'the nationalism degree' of a person. I do not believe that those who willingly or unwillingly stayed at home are more 'nationalist' than an NRI. Any person living within the Indian boundaries, who is ei-

ther corrupt or ignores his duties or harms his country by any other means cannot pretend to be more patriotic than an NRI.

In favour of an NRI, I think that he is a better choice due to the following reasons:

(i) If a foreign institute or university ignores its native and offers a position to an Indian, it simply means he is extremely good. (ii) While staying outside, an NRI has the chance to see more scientific bodies such as universities or research laboratories, thus he is better informed. (iii) An NRI has better international contacts than a 'patriot' Indian colleague does. (iv) A person who was abroad knows the feeling of how he was not a Bengali or a Punjabi but an Indian. Which means, in general, the thinking horizon of an NRI is broader than a person who was born in a particular state and stayed there forever. (v) While living abroad one learns the social, political and cultural aspects of an alien society. This knowledge helps one to better criticize or understand the 'Western' or any other culture. It could be helpful in shaping the international policies.

On the other hand, the following points may be important as arguments for criticizing the NRI.

(i) If an NRI has not visited his country for a long time he will not be able to fol-

low the changes of past, and might live in an illusion. As a consequence, he might have difficulty to adjust in the society.

(ii) It is likely that if an NRI does not find the same working conditions as he used to have, he starts criticizing the country, administration or colleagues. In such cases he should be suggested to leave India and go to a country where everything was 'better'.

In conclusion, I would like to add that Indian policy makers should adopt America's method and take any person (irrespective of his nationality) from whom the Indian society can get benefit.

1. *Frontline*, 2002, **19**, 12–25 October issue.

2. Joshi, Y. P., *Curr. Sci.*, 2003, **85**, 566.

3. Wolpert, S., *A New History of India*, Oxford University Press, New York, 1997, p. 58.

RAJINDER SINGH

Universität Oldenburg (Germany),
Fakultät V – Institut für Physik,
AG Hochschuldidaktik und Geschichte
der Physik,
PF 2503, D-26111 Oldenburg
e-mail: rajinder.singh@mail.uni-oldenburg.de

Pesticide residues

Referring to the editorial in the 10 September issue of *Current Science*, there are three pertinent points arising: Pesticide residue and the environment; Awareness among the public on the problems of environmental pollution; and Methodology adopted for testing the pesticide residues in the environment with particular reference to soft drinks.

In the case of pesticide residues, I wish to emphasize that considerable work has been going on in this country for the past four decades to bring out microbial degradation of the pesticides in the soil. Under tropical conditions, the microbial activity is better than under

temperate conditions and hence degradation of the pesticide is also faster. There are not many instances of persistence of pesticides in soil for more than two seasons, and this is particularly so in soils with rich organic matter *vis-à-vis* microbial activity. Whatever is observed under temperate conditions in the Western countries may not be straightaway comparable under Indian conditions.

In 1974, I was involved in starting the Master's degree programme in Environmental Biology in the Tamil Nadu Agricultural University (TNAU), Coimbatore. The inspiration from my alma mater, Rutgers University in USA made me pool

the resources of TNAU in microbiology, entomology, agronomy, soil science, biochemistry, agricultural engineering and meteorology to organize the Master's and Doctoral programmes in Environmental Biology. This was the first of its kind in academic and research programmes in India as well as in this part of the world. In TNAU, extensive studies were carried out on environmental pollution caused by industries such as paper pulp, sago, viscose, cement, tannery, distillery, etc. and the ill-effects on the bio-system as also the ways and means of approaches to tackle the problems were brought out. Unfortunately, there had

been a setback since this programme was suspended for want of administrative support by the University during 1980–85. The reason was mainly that at that time there were not many employment opportunities for graduates studying the subject. During the past 10–15 years, several University colleges and leading institutions in India have been offering academic programmes and carrying out extensive research work to evolve ways and means of minimizing environmental pollution. For example, technology for microbial degradation of sugar factory and distillery effluents to produce biogas as fuel and biofertilizer has been developed and has come to use by the concerned industries. It is interesting to learn that the Supreme Court had taken up this issue as early as in 1991 and had issued instructions that all the States in the

country should incorporate Environment as a general knowledge subject in schools and colleges in the country. A news item in the 23 September 2003 issue of *The Hindu* reports that the Supreme Court slapped a fine of Rs 15,000 each on 10 states which had not taken steps to implement an earlier order issued in this regard.

Regarding the methodology adopted for assessing the pesticide residues in the environment, especially in soil and water, there has been continuous upgradation of the technologies in the world. At the International Institute of Biotechnology and Toxicology, Padappai, Kancheepuram District, Tamil Nadu, the latest methods are followed. This Institute, being an NGO registered as a non-profit making Society, is recognized for assessing pesticide quality and quantities,

including persistence in soil and water, residues in various agricultural produce, etc. not only by the Government of India but also by the German Federal Bureau for GLP Compliance, which is the most respected international agency in the world. Pesticide testing is done at this Institute for various countries, including Japan, UK, France, USA, etc. If called for, the Institute will carry out studies on soft drinks for pesticide residues, adopting the international standards on hand.

G. RANGASWAMI

Ravi Nivas,
17, Indira Gandhi Road,
Fairlands,
Salem 636 016, India
e-mail: drgr@eth.net

Plant biotechnology

The late sixties and seventies witnessed Indian plant breeders taking giant strides in enhancing wheat and rice productivity, transforming India from an importing nation to one exporting food grains. More recently rate of gain in productivity seems to have plateaued. There were times when breeders looked at the emerging fields of mutation breeding and tissue culture with awe and expectations. The illusion is over and we are witness to the real picture. These have occupied their place in the history of development of science and/or as an adjunct to the major field, the discipline nuclear to crop science research, i.e. plant breeding.

Indian plant biotechnology has come of age accomplishing research projects of national and international importance, e.g. rice genome sequencing project. Plant Biotechnology (PB) offers two major options to plant breeders. Marker-assisted selection (MAS) offers to make selection for desirable segregants precise and expression independent¹. The question, however, which traits and who will do it, remains unattended. The molecular biologists who have so far been experimenting with it are alienated from those who will ultimately be practising MAS.

The moment science of MAS for a trait of importance is perfect enough to become a technology, the same needs to be transferred to the end users, the plant breeders in this case. The interesting aspect of plant biotechnology outputs is that they need to pass through plant breeders before they reach the final consumers. Molecular biologists who tag a trait, need to be encouraged to convert it into a technology for use by breeders. Research managers can play a role to ensure that funds invested in these scientific endeavours lead to usable technology and the same is passed on to breeders to cut down the enormous costs involved in the elaborate plant breeding operations. The next logical question is to decide which traits to tag? The obvious answer is those which breeders find difficult to select for.

Transgenic technology is the other major important intervention that PB offers. This tool has immense potential and the same is evident from the fact that currently over 130 million acres are planted under transgenic crops the world over. The global market value of biotech crops, which stood at 3.8 billion US dollars in 1998, is slated to rise to five bil-

lion US dollars by 2005 (ref. 2). India has also benefited from this technology by adopting boll worm-resistant transgenic cotton. This is one field, which needs to be strengthened by investing human and financial resources in the form of groups dedicated to specific trait and crop. Development of technology needs to be regarded as an equally important contribution as publication. Only such an approach will encourage researchers to be focused and dedicated to the product development rather than just the publication, which in turn will make PB more relevant and responsive to the society's needs.

1. Gupta, P. K., *Curr. Sci.*, 2002, **83**, 113–114.
2. McDougall, P., *Agro-Food-Industry High Tech*, May/June 2002.

RAJIV K. SHARMA*
NEELU JAIN

Division of Genetics,
Indian Agricultural Research Institute,
New Delhi 110 012, India

*For correspondence.
e-mail: rajivksharma@rediffmail.com