Building process of science for societal security

This is with reference to the commentary 'Science and its applications to societal security'[1], where the author underscored the centrality of science in providing alternatives to immediate challenges, from food security to energy security in the country.

All along, it was the societal commitment of scientists, which found a conducive atmosphere in the form of 'political will' to groom and grow. I would like to point out to the emerging trends which demand immediate attention to rebuild our looming scientific strength[2] and capacity, as our society ('developing') strives to maintain the much required stability against the ebbs and flows of economic opportunities and environmental changes.

Building the 'ingenuity' and boosting the 'confidence' of our scientific community is the *sine qua non* for a robust mechanism in place to respond to any challenge, scientific or political. A cursory look at some of the recent articles, letters[3–5], and editorial[6] on this topic not only provides a broad overview of the sorry state of affairs of Indian science, but also hints towards the eroding commitment and interest of the younger generations for scientific research.

Several factors could be discussed as agents for all this. One among them is the need for immediate intervention in the university system and research agendas, cultures and practices. In a globalized world, where uncertainty has become the trend and truth, there is no alternative to human ingenuity and social capital. It is high time, all those who are part of this dynamic process come up with major policy interventions to weed out the rot in the system, from researchers to policy makers and politicians. The need of the hour is to initiate a bottom-up process of dialogue and consultations with research students, Ph D candidates and even master's students at universities and research institutions. Their understandings and aspirations should be taken care of during policy formulations. Sincere and sustained efforts in this direction require participation without fear or favour at all levels, if we want to move against uncertain challenges and ensure overall security of the nation and society. It is necessary that the security of the building blocks of science be in place, before it could work for the societal security.

1. Parthasarathi, A., *Curr. Sci.*, 2004, **87**, 1174–1175.
2. Kothari, L. S., *Curr. Sci.*, 2004, **87**, 1029.
3. Rao, K. S., *Curr. Sci.*, 2004, **87**, 1029.
4. Patra, J., *Frontline*, 2004, **21**, 20.
5. Bachhawat, A. K., *Curr. Sci.*, 2004, **87**, 1166.
6. Balaram, P., *Curr. Sci.*, 2004, **87**, 1163–1164.

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Origin of river Sarasvati

The communication 'Is River Ghaggar, Saraswati? Geochemical constraints' by Tripathi *et al.*[1] is interesting. They appear to support our view[2,3] that the origin of the legendary Sarasvati could not have been glacial. The authors, based on Sr and Nd isotopic composition of the Ghaggar alluvium, conclude that their 'isotopic data provide a scientific basis for the absence of a glacial-fed, perennial Himalayan river in the Harappan domain, i.e. the River Ghaggar is not the River Saraswati as far as its origin in the glaciated Himalayas is concerned. Alternatively, the river Saraswati had its origin in the sub-Himalayas'. Our work tends to support the latter.

Isotopic composition (^{2}H, ^{18}O, ^{3}H and ^{14}C) and other data on the groundwater in the Kishangarh–Ghantiyali–Ghotaru sector of Jaisalmer district show[2,3] that the river Sarasvati possibly recharged this aquifer in ancient times. It was also seen that the ^{18}O values cluster around –6‰, but could not have been more depleted than –9‰. These ^{18}O values are enriched compared to the ^{18}O values of other Himalayan rivers of glacial origin like Chenab[4] (–12‰) and Ganga[5] (–10‰). This leads us to conclude that the origin of Sarasvati could not have been glacial, but probably was in the lower Himalayas (say Shivaliks).

A *Rigvedic* description mentions the sudden appearance of the river following the breaking up of mountains, distinctly pointing out tectonics being responsible for the birth of Sarasvati. Glacial melting would have taken thousands of years for the river to attain the *Rigvedic* description of its majesty and its tempestuous roar, while cascading down the Himalayan slopes.

1. Tripathi, J. K. *et al.*, *Curr. Sci.*, 2004, **87**, 1141–1145.
2. Nair, A. R., Navada, S. V. and Rao, S. M., *Vedic Saraswati: Evolutionary History of a Lost River of Northwestern India* (eds Radhakrishna, B. P. and Merh, S. S.), Mem. Geol. Soc. of India, 1999, pp. 315–319.
3. Rao, S. M., *J. Radioanal. Nucl. Chem.*, 2003, **257**, 5–9.
4. Rao, S. M. *et al.*, Proceedings of the International Symposium on the Use of Isotope Techniques in Water Resources Development, IAEA, Vienna, 1987, pp. 403–425.
5. Navada, S. V. and Rao, S. M., *Isotopenpraxis*, 1991, **27**, 380–384.

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