The Indian Government is using double standards in tackling opposition to nuclear power and GM crops. Indian scientists need to be more proactive and interact with print and audiovisual media through articles, debates, etc. so that people do not get a one-sided version. Allegedly adverse experiences reported by grassroot workers should be documented and evidence-based explanations provided after investigating them instead of discarding them off-hand.

1. Gupta, P. K., *Curr. Sci.*, 2012, **103**, 995–1002.

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Top Indian higher education institutions and the Leiden and Scimago rankings

We now have releases from both the Leiden Ranking 2011/2012 (http://www.leidenranking.com/default.aspx) and the *Scimago Institutions Rankings* (*SIR*) *World Reports* (http://www.scimagolab.com/, http://www.scimagoir.com/) covering the 2005–09 period.

The Leiden Ranking evaluates the scientific performance of 500 major universities worldwide using *Web of Science* (*WoS*) data of Thomson Reuters. Only publications (document types article, letter and review) in the sciences and the social sciences are included, whereas publications in the arts and humanities are excluded. A new impact indicator, the proportion top 10% publications ($PP_{top\ 10\%}$), is introduced. This is the proportion of the publications of a university that, compared with other similar publications, belong to the top 10% most frequently cited. Publications are considered similar if they have been published in the same field and the same publication year, and if they have the same document type. In this sense, it has a normalizing effect across fields, publication year and document type, and is now gaining acceptance as a robust quality indicator. The ratio $q = PP_{top\ 10\%}/100$, allows one to fractionalize this proxy.

Similarly, the *SIR World Reports* quantify the research performance of 3042 leading research institutions in the world. Now, citation and publication data from *Scopus* (www.scopus.com), an Elsevier product, are used. We shall look at the 2011 report (since then, the 2012 report covering the 2006–2010 period has been released) as it covers the period 2005–2009 for direct comparison with the Leiden Ranking, which covers the identical period. *Scopus* is a more comprehensive database than *WoS* and accounts for nearly 80% of all research. This will become clear when we present the results below.

Although bibliometric data are available in the form of six indicators representing categories like scientific impact, thematic specialization, output size and international collaboration networks of the institutions, we shall focus on the quantity proxy, the O (or output) indicator which is a measure of the quantity or size of the publication output of an institution and one quality proxy, ER (or excellence rate), which indicates the percentage of scientific output of an institution that is included into the set formed by 10% of the most cited papers in their respective scientific fields. Again, the ratio $q = ER/10$, allows one to fractionalize this proxy.

In both the Leiden and Scimago rankings, if we consider q to be the quality

Table 1. Comparison of the performance of four top Indian higher education institutions with that of Harvard University and four other Western institutions with comparable output

	Leiden 2005–2009: *WoS*				*Scimago* 2005–2009: *Scopus*			
Institution	*P*	*q* = PP	q^2	*X*	*P*	*q* = ER	q^2	*X*
Top world higher education institutions								
Harvard Univ	33,511	0.225	0.0506	1696.49	69,995	0.357	0.1274	8920.79
Ecole Polytech Fédérale Lausan	4,790	0.188	0.0353	169.30	13,464	0.202	0.0408	549.39
Carnegie Mellon Univ	3,577	0.197	0.0388	138.82	12,720	0.165	0.0272	346.30
Univ Dublin Trinity Coll	2,692	0.147	0.0216	58.17	6,985	0.191	0.0365	254.82
Univ Dundee	2,457	0.140	0.0196	48.16	5,381	0.257	0.0660	355.41
Four top Indian higher education institutions								
Indian Inst Sci	4,239	0.085	0.0072	30.63	8,042	0.119	0.0142	113.88
Indian Inst Technol Kharagpur	3,204	0.090	0.0081	25.95	6,213	0.094	0.0088	54.90
Indian Inst Technol Madras	2,587	0.088	0.0077	20.03	4,990	0.074	0.0055	27.33
Indian Inst Technol Delhi	2,502	0.081	0.0066	16.42	5,583	0.086	0.0074	41.29

P is the number of papers published during 2005–09; PP is the proportion of the publications belonging to the top 10% most frequently cited according to the Leiden Ranking; ER is the proportion of scientific output of an institution that is included into the set formed by 10% of the most cited papers in their respective scientific fields from the Scimago Ranking and *X* is the second-order indicator of performance in each case.

indicator, and Q to be the zeroth-order indicator of performance, then it is possible to combine this to obtain a first-order indicator of performance, qQ and a second order indicator of performance, $X = q^2Q$. This means that we are in fact simplifying the interpretation of the *SIR* and Leiden data to imply that a quantity term (Q) and a quality term (q) will lead to a single composite term, $X = q^2Q$, that serves as the best proxy for total performance in the research context.

Table 1 is a league table using the X indicator based on the quantity and quality proxies used by Leiden and Scimago. The Leiden Ranking covers only four top Indian higher education institutions. We compare the performance of these four institutions with that of the leading higher education institution in the world, namely Harvard University and four other Western institutions with comparable output.

From Table 1 it becomes clear that the publication output of Harvard is nearly an order of magnitude larger than that of the top-ranking Indian institutions. The quality proxy put Harvard about three to four times ahead of the top Indian counterparts. The net effect is that in terms of the second-order indicator of performance, Harvard is typically about 100 (Leiden data) to 200 times (*Scopus* data) ahead of the top Indian institutions. Even institutions with comparable output perform at higher quality levels than our top technical institutions.

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Plant invasion researches in India: how long do we have to wait for appropriate management options?

The problem of plant invasion is increasing at a great pace worldwide and in India as well. Significant efforts have been invested in invasion-related research with respect to money and time, which have lead to a substantial increase in publications in the field in recent years. In this study we report the progress of plant invasion researches in India and how it is evolving in terms of the stages of plant invasion process (comprising introduction–establishment–naturalization–invasion success continuum) in the last two decades. We also aim to address the challenges associated with the management and control of the impacts of invasion. In India, the first milestone in the field of plant invasion ecology was the 'International workshop on ecology of biological invasion in the tropics' sponsored by the Special Committee On Problems of Environment (SCOPE) and Govind Ballabh Pant Institute of Himalayan Environment and Development (GBPIHED) held in 1989 at Nainital[1]. Thus 1989 could be considered as the beginning of plant invasion research in India and continuous literature on plant invasion biology has been added thereafter.

A bibliometric analysis was performed to find out the research articles and all papers dealing with the aspect of plant invasion ecology in India starting from 1989. The documents were searched for papers using the term invasion and its derivatives[2,3], and the results refined with 'ecology' as 'subject area' and 'address' as 'India' using the on-line database of the *Science Citation Index* (*SCI*) retrieved from the ISI *Web of Science*, Philadelphia, PA, USA from 1989 to 2010. A similar search was also performed on the *Google Scholar*. These searches cumulated 122 hits (or 122 articles on plant invasion biology related to India).

The results suggest that the number of papers published in individual years increased drastically after 2005 (with 7 papers in 2005 to 34 papers in 2010). Content analysis of all the 122 articles was carried out and the articles were grouped into six categories[3], viz. establishment, spread, impact, control, management and multidisciplinary with 29, 36, 36, 3, 8 and 10 hits obtained in each category respectively (see Table 1). We divided two decades into four time slots, each slot consisting of a five-year timespan. Articles in each time slot were segregated into the above-mentioned categories. Total number of articles in each category was quantified for each time slot. During the content analysis of the researches published in each slot, it was found that most of the researches in the initial time slot of 1989–1995, 1996–2000 and 2001–2005 focused on the spread, impact, establishment and invasive success of the non-natives. However, during the 2006–2010 time-slot few articles considering management and control

Table 1. Description of categories in Indian plant invasion researches, including percentage of publications in each category

Category	Description of category	Publication (%)
Establishment	Focus on establishment and mechanisms of species establishment	23.7
Spread	Discuss the spatial spread of species	29.5
Impact	Discuss the impact of invasives on native flora or fauna	29.5
Control	Discuss strategies for controlling invasives, but which have still not been implemented at larger ground level	2.5
Management	Discuss management of invasives, but which has still not been implemented at the ground level	6.6
Multidisciplinary	Focus on the definitions, concepts, mechanisms, new introductions, distribution, abundance, demography and synergistic effects, etc. caused by invasives (i.e. research largely confined to classical invasion biology)	8.2