

4. Parr, J. F. and Sullivan, L. A., *Soil Biol. Biochem.*, 2005, **37**, 117–124.
5. Epstein, E., *Annu. Rev. Plant Physiol. Plant Mol. Biol.*, 1999, **50**, 641–664.
6. Rajendiran, S., Coumar, M. V., Kundu, S., Ajay Dotaniya, M. L. and Rao, A. S., *Curr. Sci.*, 2012, **103**, 911–920.
7. Parr, J. F., Sullivan, L. and Quirk, R., *Sugar Tech.*, 2009, **11**, 17–21.
8. Zuo, X. and Lü, H., *Chin. Sci. Bull.*, 2011, **56**, 3451–3456.
9. Street-Perrott, F. A. and Barker, P. A., *Earth Surf. Process. Landf.*, 2008, **33**, 1436–1457.
10. Li, Z., Song, Z., Parr, J. F. and Wang, H., *Plant Soil*, 2013, **370**, 615–623.
11. National Mission on Bamboo Applications, Department of Science and Technology, New Delhi, 2004.
12. Champion, H. G. and Seth, S. K., *A Revised Survey of the Forest Types of India*, Natraj Publishers, Dehradun, 1968 (reprinted 2005).
13. Roy, P. S. *et al.*, *Biodiversity Characterization at Landscape Level: National Assessment*, Indian Institute of Remote Sensing, Dehradun, 2012.

ARUN JYOTI NATH

Department of Ecology and
Environmental Science,
Assam University,
Silchar 788 011, India
e-mail: arunjyotinath@gmail.com

Time to publish: the scientific efficiency of nations

Using the simple arithmetical rule of three, I had earlier computed the time it takes for an average scientist to publish a paper¹. This is a simple proxy for meas-

uring the scientific efficiency of the R&D workforce of a country. The latest UNESCO Science Report² gives the number of full-time researchers deployed by a country per million of its population (say S scientists/million), and also the number of peer-reviewed scientific papers (i.e. articles, reviews and notes only) indexed in the *Web of Science* database from Thomson Reuters published per million per year (say P papers/million/yr). The ratio $TtP = S/P$ has the curious units: years/paper/scientist. TtP therefore measures the average number of years a scientist takes to publish a paper.

Table 1 gives a comparison of some leading countries in scientific R&D. Figure 1 displays this graphically.

Table 1. The number of years it takes for an average scientist to publish a paper

Country	Researchers/million inhabitants (2013) ^a	Papers/million inhabitants (2014) ^b	Time to publish
Switzerland	4495	3102	1.45
Australia	4335	1974	2.20
South Africa	408	175	2.33
Sweden	6509	2269	2.87
Canada	4494	1538	2.92
United Kingdom	4108	1385	2.97
Singapore	6438	1913	3.37
Finland	7223	1976	3.66
India	160	42	3.81
Brazil	710	184	3.86
Germany	4355	1109	3.93
United States of America	3984	998	3.99
France	4125	1007	4.10
China	1071	184	5.82
Israel	8337	1431	5.83
South Korea	6533	1015	6.44
Japan	5195	576	9.02
Russia	3085	204	15.12

^aResearchers per million people (from table S6 of the UNESCO Science Report²).

^bPapers/million inhabitants (from table S8 of the UNESCO Science Report²).

1. Prathap, G., *Curr. Sci.*, 2006, **91**, 1438.

2. UNESCO Science Report, Towards 2030; <http://en.unesco.org/node/252168>

GANGAN PRATHAP

Vidya Academy of Science and
Technology,
Thrissur 680 501, India; and
A.P.J. Abdul Kalam Technological
University,
Thiruvananthapuram 695 016, India
e-mail: gangan_prathap@hotmail.com

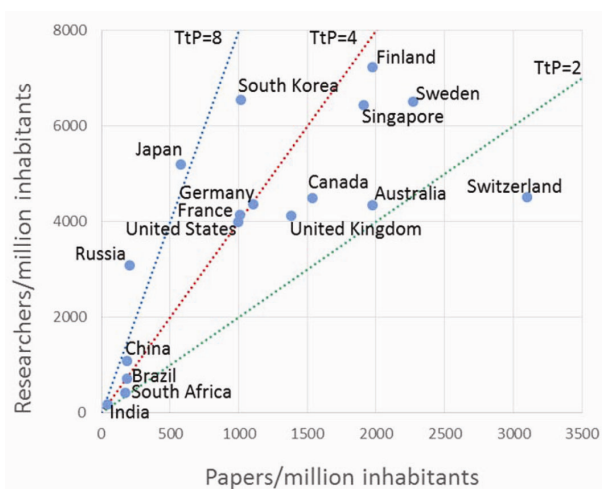


Figure 1. The number of years it takes for an average scientist to publish a paper.