Correspondence

Citizens add to satellite forest maps

Satellite data are invaluable for mapping India's remaining forests, but their coarse resolution limits the information they can provide for protection purposes (*Nature* **489**, 14–15; 2012).

For example, individual tree species cannot be identified from satellite data. This encourages selective felling of valuable trees, such as teak, while green cover is maintained to avoid satellite detection. Also, remotely sensed data do not reveal areas where local communities have a close relationship with the forests, as in India's Meghalaya hills.

Mobilizing citizens to provide information on the ground ('crowd sourcing') complements remote-sensing data. Using devices such as mobile phones (see www.geo-wiki.org), this approach provides a means to report illegal logging, catalogue trees that need protection because of their cultural, ecological or economic importance, validate spatial forest data and quantify forest degradation. It also raises awareness and informs public debate on sustainable forest management. In Brazil, for example, citizens have used the Globo Amazônia website since September 2008 to log millions of complaints against illegal activities as a cause of deforestation (see www.globoamazonia.com).

The controversy over India's forest resources is worrying, but it points to an emerging transparency in governance that allows people's concerns to be voiced. Crowd sourcing would enhance this transparency while improving the quality of data.

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Database for sharing costly equipment

To mitigate the effects of the 45% government cuts to capital budgets in 2010, the UK Research Councils promoted the sharing of research equipment within and between institutions.

I published a report on this matter earlier this year for the N8 partnership of eight research-intensive universities in northern England (see go.nature.com/6jvpiip), concluding that the overheads of sharing mean that it is mainly confined to expensive items, and that it works best when run within a collaboration. Already the study has catalysed strategic collaborations. Some research-intensive companies are also now exploring the possibility of joining these arrangements.

Logistical and cultural factors can be a problem. Most researchers will help friends and collaborators, but are wary of strangers using their facilities. They may worry about intellectual property or whether visitors will respect the equipment and are adequately trained in using it. It is easiest to set up sharing arrangements at the time of purchasing the equipment.

One challenge is to know what facilities are already

available. Researchers might buy an item when there is one with spare capacity nearby. The N8 is developing standardized databases of capital assets built around a taxonomy of equipment types and functions. Availability will need to be checked because state-of-the-art items often operate at near-full capacity or may be configured to a particular experiment. Usage charges are also needed to cover access costs, such as technicians' time.

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Cash puts publishing ethics at risk in China

The number of scientific papers published in China in recent years has increased exponentially (see go.nature.com/8fjhdtd). There are concerns that these numbers are being inflated by a payment scheme offered by some Chinese institutions to boost publication in journals with high impact factors (J. Shao and H. Shen *Learned Publ.* **24**, 95–97; 2011).

Such monetary incentives could adversely affect scientific publishing behaviour in China. Payments to editors to improve the impact factor

of their journal, for example, could encourage them to coerce authors into citing more articles from that journal (see go.nature.com/ye2gae). Or it could result in citation cartels in which journals cite each other for mutual benefit (see, for instance, go.nature.com/p4u8on).

These schemes risk disrupting the drive to reduce ethical issues that undermine Chinese science.

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Rural factories won't fix Chinese pollution

China's green movement is awakening and starting to receive global attention (see, for example, Q. Wang *et al.* *Nature* **489**, 502; 2012). The municipal governments of Qidong and Shifang should be applauded for suspending two planned industrial plants likely to cause widespread pollution (*Nature* **488**, 261–262; 2012). But there may be plans afoot to relocate these to rural areas.

Moving factories from cities to rural areas is becoming more common. The relocation by local government of a US\$1.4-billion paraxylene plant from Xiamen City in Fujian province to the less-developed Gulei Town was not welcomed by residents (T. Ma *China Environ. Ser.* **10**, 33–49; 2008/2009). Their protests received little media attention or help from non-governmental organizations (NGOs), and the new plant is now almost complete.

Shifting pollution from urban to rural areas can only be a short-term fix. For example, rural and semi-rural factories trebled their contribution to the national wastewater discharge between 1990 and 2007 (see go.nature.com/kdgh3; in Chinese), and there are more than 200 cancer-cluster villages in China where pollution is suspected as the major cause of death.

More local NGOs are needed

to support rural populations in suing polluting industrialists. To ensure sustainability of the country's huge production system, industrialists must embrace the green economy and tackle factory pollution at source.

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Metrics: a long-term threat to society

A predictive *h*-index formula for measuring a scientist's potential success (D. E. Acuna *et al. Nature* **489**, 201–202; 2012) might be convenient for decision-making by hiring committees and funding agencies, but such metrics threaten the researcher's wider contribution to society.

Long-term creativity is needed if scientists are to inspire the younger generation. As Albert Einstein said, "creativity is the residue of time wasted" — but researchers are no longer in a position to waste time.

Research pressures also curtail the quality of teaching and supervision, and disadvantage mothers who are trying to build a scientific career (K. R. O'Brien and K. P. Hapgood *Oikos* **121**, 999–1004; 2012). Moreover, early burnout means that some highly trained scientists are being lost to society.

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Metrics: a fetish for high-profile journals

Precise research indicators may be crucial to the field and useful for grant committees, but the failings of the predicted *h*-index proposed by Daniel Acuna *et al.* mean that it is unlikely to be classed among them (*Nature* **489**, 201–202; 2012).

For example, the *h*-index ranking of two co-authors of a research paper can be

reversed if they have different individual *h*-indices to start with (L. Waltman and N. J. Van Eck *J. Am. Soc. Inform. Sci. Technol.* **63**, 406–415; 2012). Also, the formula for predicting an *h*-index is probably valid only for neuroscientists, given that different fields have other significant features. The formula's structure does not consider publications in conference proceedings or in books as variables, thereby exacerbating the fetishism surrounding publication in high-profile journals.

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Metrics: allow more gradual progress

New metrics designed to evaluate a scientist's potential, such as a future *h*-index depending on past trajectories (D. E. Acuna *et al. Nature* **489**, 201–202; 2012), fuel the delusion that only fast results count. Progressive paradigms based on mature ideas, meticulous work, sound ethics, patience and cooperation may be slower, but they still contribute to science in the long term (J.-F. Lutz *Nature Chem.* **4**, 588–589; 2012).

French physicist Louis de Broglie (1892–1987), a pioneer of quantum mechanics, once declared that had Isaac Newton lived in his day and age, Newton might never have become a scientist at all. He would have been bewildered by today's academic rat race and would probably have confined himself to his post as Warden of the Royal Mint instead.

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Librarians or science informationists?

As representatives of an international group of library directors, scientists and research administrators, we recognize that science librarians have evolved

into 'science informationists' (see go.nature.com/jmvjej). This more accurately reflects their expanded responsibilities, interdisciplinary skills and specialized knowledge.

The increasing volume and complexity of knowledge demands new organizational techniques. Transforming library services calls on technological advances in searching, visualization, data mining and analysis. As technologies and data sources proliferate, there is a growing need to educate students and researchers about these capabilities.

Science informationists collaborate with scientists to enhance their research by helping them to assess its impact, and to curate and manage data. They make knowledge accessible, for example by using their skills in tailoring vocabularies and ontologies. They preserve and showcase their institutions' intellectual output by building networked repositories, and they work with publishers to improve standards, platforms, publication models and search facilities in the interests of better communication.

Science informationists also build sustainable systems through broad collaborations and seek out the best ways to develop these relationships within their institutions. Like researchers, they understand that science needs risk-takers, innovators and visionaries.

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Clean stoves benefit climate and health

Some 3 billion people worldwide are dependent on rudimentary stoves that burn wood, dung or coal. These account for about 20% of black-carbon emissions globally, as well as 2 million deaths annually from smoke inhalation. More-sophisticated stoves could dramatically reduce these figures, helping to combat climate change and improve public health.

Conventional stoves that burn solid fuels release black and brown carbon particles, along with gases that are implicated in climate warming (including carbon dioxide, ozone-producing gases and methane). As super-efficient absorbers of sunlight, these particles also affect agricultural crop yields.

Modern stoves with natural convection halve solid-fuel use, saving money and collection time. Forced-convection stoves equipped with a fan to increase combustion efficiency cut particulate emissions by 80–90%, black carbon by 60–90% and ozone-producing gases by 50–90% (J. Jetter *et al. Environ. Sci. Technol.* **46**, 10827–10834; 2012; and A. Kar *et al. Environ. Sci. Technol.* **46**, 2993–3000; 2012). Clean fuels, such as liquid petroleum gas, biogas or ethanol, would cut these emissions further.

The Global Alliance for Clean Cookstoves (www.cleancookstoves.org), which has almost 400 partners, including 36 countries, aims to have 100 million homes adopt clean and efficient stoves by 2020. It is developing financing tools for businesses and consumers to ensure that these user-friendly cooking stoves are affordable and available to all.

The Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants (www.unep.org/ccac) offers a new opportunity to promote energy-efficient stoves that specifically lower black-carbon emissions.

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CONTRIBUTIONS

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