

## OPINIONS

### India's march towards open access

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**Subbiah Arunachalam argues that the best way to make scientific research more available worldwide is to encourage scientists to self-archive their research.**

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In December 2003, the Indian National Science Academy (INSA) held a one-day conference on access to scientific data and information as part of its annual meeting in Pune. The conference was held to address two key problems faced by Indian scientists — poor access to international journals and the low visibility of papers published by Indian scientists — and the possible solutions offered by electronic publishing and open archives.

Inaugurating the conference, Raghunath A. Mashelkar, director-general of India's Council of Scientific & Industrial Research, spoke of how international organisations such as the World Health Organisation (WHO) and the Food and Agriculture Organisation (FAO) were helping developing countries improve electronic access to expensive journals through the HINARI and AGORA programmes, respectively.

Unfortunately, however, India has not benefited from either of these programmes. Although journal publishers are willing to provide toll-free electronic access to researchers in countries where relatively few scientists read their journals, they are not prepared to do so in larger developing countries such as India, where they already have a considerable number of subscribers. Yet India's average gross domestic product (GDP) is, per capita, less than half the threshold agreed upon by the WHO and FAO when they set up the HINARI and AGORA programmes.

#### A radical response

So scientists in such countries need to find a more radical response by harnessing the new opportunities provided by information and communication technologies (ICTs). We need to break away from the existing model of publishing and communicating scientific knowledge. One way of doing this is to embrace the 'open-access' approach being promoted by the Budapest Open Access Initiative with its two complementary strategies of setting up interoperable open archives and promoting open-access journals.

Several Indian publishers have already adopted the open-access philosophy for the electronic versions of their journals. Unlike some open-access journals in other countries, in which authors pay to publish their papers, Indian open-access journals use government grants and subscriptions to their print version to cover publishing costs.

All 10 journals of the Indian Academy of Sciences, for example, as well as the four journals of INSA are open-access journals. In fact, INSA has already produced free-access electronic versions of back volumes for all its journals, and the Indian Academy of Sciences is also attempting a similar 'retro-digitisation'.

The *Journal of the Indian Institute of Science* is also available in this form back to its very first issue, published in 1914. The Indian Medlars Centre of the National Informatics Centre, New Delhi, is bringing out electronic versions of 22 biomedical journals, all of them accessible without subscription. The Medlars Centre also has an online bibliographic database, [www.indmed.nic.in](http://www.indmed.nic.in), providing titles and abstracts of articles from 77 Indian biomedical journals.

Medknow Publications, a small company based in Mumbai, has helped 10 medical journals — including the *Journal of Post Graduate Medicine* and *Neurology India* — make the transition from print to electronic open access and all of them are doing much better now than before.

In addition, some Indian open-access journals are using international agencies such as Bionline, a not-for-profit electronic publishing service for developing countries, and JournalServer.org, an online library of academic journals, to gain greater visibility.

However, open-access publishing needs to be complemented by setting up interoperable institutional archives, which allow researchers to make versions of their articles publicly available online both before and after publication.

An additional attraction of such archives is that they would raise the profile of Indian research. At present, research

originating in an Indian laboratory and published in expensive journals all too often goes unnoticed, even by other researchers in India. Creating institutional archives of such work would help to integrate it into the global knowledge base, to reduce the isolation of our scientists and to improve opportunities for funding and international collaboration.

The clear advantages offered by institutional archiving over the present publishing system, in which many research papers are held in the back issues of journals controlled by commercial (and some society) publishers in other countries, suggests that the government should have an interest in ensuring its success. India's University Grants Commission, for example, should insist that major universities with a large output of science and technology papers set up institutional archives.

Other funding agencies — such as the Department of Science & Technology, Department of Scientific & Industrial Research, Department of Biotechnology, Department of Atomic Energy, Department of Space, Indian Council of Agricultural Research and Indian Council of Medical Research — should also insist that research papers resulting from work supported by their funds be made available through open-access archives and toll-free journals.

India is not the only country being drawn towards open access. In China — for example, among officials of the National Natural Science Foundation and the Institute of Scientific and Technical Information in China, as well as researchers with the Chinese Academy of Sciences — there is already significant interest in its benefits to the country's scientists.

Reflecting this interest, in mid-June 2004 China will hold a major national conference on open access in cooperation with the US National Academy of Sciences. And in the last week of June, the Eighth International Conference on Electronic Publishing will take place in Brasilia.

The first phase of the World Summit on the Information Society, held last December, has given a considerable boost to these efforts: the WSIS Declaration of Principles and Plan of Action include strong statements in favour of open access to scientific literature. UN secretary-general Kofi Annan has also offered his support.

### Nurturing the network

International action is one thing, but genuine free access is another. It will need a champion (or champions) in every institution to promote the creation of institutional archives, and persuade scientists to place their papers in them.

Free access also requires adequate hardware and connectivity. Many universities and research institutions in the developing world lack both computers and high bandwidth Internet connectivity, so part of the strategy of open-access proponents must include campaigning for improved ICT facilities. Luckily, costs of both hardware and Internet bandwidth are coming down all over the world.

Another important hurdle to overcome is the fact that many scientists labour under the impression that journal editors may not accept archived papers, claiming that this represents an unacceptable form of 'pre-publication'.

These scientists worry that it will be difficult to assess the impact of their research if it isn't published in conventional journals. After all, they argue, promotions and awards are often determined by the impact factor of the journals in which one's work is published. Many are also unaware of the advantages of gaining greater visibility and are reluctant to make the effort to post their articles on archives.

Just over a year ago, for example, the National Centre for Science Information (NCSI) at the Indian Institute of Science (IISc), the country's best-known higher education institution in science and technology, set up an institutional archive. The institute publishes about 1,800 papers a year, of which about 900 are indexed in the Web of Science, which gives access to the world's most prestigious, high impact research journals.

Yet so far, the archive has attracted less than 70 papers. This experience emphasises an important point: it is not enough just to create an open-access archive. Filling it is far more important (and difficult). After all, an empty archive is worse than having no archive at all.

But attitudes of the journals are changing, making institutional archiving a more attractive proposition. It is important for champions of open access to let scientists know that many journals, including high-impact titles such as *Nature* and the *British Medical Journal*, already permit authors to archive both preprints and postprints. The emphasis should therefore be on setting up open archives rather than on persuading journal publishers to make their journals open access.

If scientists and scientific establishments in China, India and Brazil can be persuaded to adopt open access quickly, then it is likely that the rest of the developing world will follow.

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