

## How open access to scientific journals can help the developing world

**Open access publishing models are having a significant impact on the dissemination on scientific information but their impact on the developing world is uncertain, writes Jorge L Contreras.**



Over the past several decades, the cost of scientific journals has risen precipitously, causing many academic libraries, particularly those in the developing world, to curtail their subscriptions drastically. This phenomenon, popularly known as the “serials crisis”, has had the effect of limiting knowledge flow to the developing world and limiting the ability of developing world researchers to participate fully in the global scientific community.

In response to the “serials crisis”, new models of scientific publishing began to emerge in the 1990s under the general banner of “open access”. One such approach, popularly termed “green” open access, encourages researchers to post versions of their published articles on academic websites or self-archiving sites, making them broadly available without charge. One recent study found that approximately 12% of the scientific literature published in 2008 can be found in green open access archives.

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Another approach that has gained significant traction is “gold” open access publishing, in which journals make their entire contents freely available online, but charge publication fees to authors. Gold open access ventures such as the Public Library of Science and BioMed Central have attracted the backing of numerous influential scientists and support from major philanthropic organisations. One study found that in 2009 nearly 200,000 peer-reviewed articles were published in 4,769 gold open access journals, representing between 6% and 8% of the total peer-reviewed scientific literature published that year. Open access journals have thus seen impressive gains in just a decade, even as the large majority of peer-reviewed scientific output continues to appear in commercial, limited-access journals.

In addition to open access publishing, a number of research institutions and funding agencies have begun to insist that research undertaken under their auspices be released on an open access basis. The best known of these initiatives is PubMed Central, a programme of the US National Institutes of Health (NIH) which mandates that all scientific research that is funded by NIH (which makes grants in excess of \$30bn per year) be released in NIH’s freely-accessible PubMed Central database within one year of publication. The UK’s Wellcome Trust and Medical Research Council, as well as numerous other funding agencies and philanthropies across the world, have implemented similar requirements.

While these and other initiatives have made great strides toward alleviating the effects of the serials crisis in the industrialised world, a unique set of issues persist in the developing world. At a practical level, low rates of broadband penetration seriously limit access to online resources. Another factor that impacts the availability of scientific literature in the developing world is so-called “information philanthropy”. Partially as a result of calls for global open access, programmes have been implemented by philanthropic organisations and commercial publishers to provide researchers in the developing world with free or significantly discounted access to paid journals. While such programmes have expanded access to publications that would otherwise be inaccessible, some observers have questioned their overall usefulness and sustainability. More fundamentally, some question whether content from western journals is sufficiently relevant to research and practice in developing countries and question whether the free availability of so much international scientific content actually hinders the development of local knowledge.

Some believe that “green” self-archiving is the key to scientific advancement in the developing world. Certainly, green open access can make otherwise inaccessible literature available in the developing world. But it is not clear that self-archiving will meaningfully increase research output by scientists in the developing world, or make their work more visible to (or respected by) scientists in the industrialised world (ie south-north transfers). As in the industrialised world, the gold (author-pays) open access route has also been advanced as a viable solution for the developing world. To their credit, many open access publishers waive or heavily discount author fees for researchers in low-income countries. But this seeming generosity may actually work to the disadvantage of locally-produced open access journals. Like journals in the industrialised world, these journals need to meet costs associated with publication, editing, and peer review. Yet they cannot depend on

income from a steady stream of well-funded researchers. Their authors are likely to be from the developing world. As such, these journals cannot afford to waive fees for developing world researchers, as this would eliminate most of their income. Thus, these journals are at a significant competitive disadvantage to western open access journals when competing for high-quality authors from the developing world.

Funder mandates such as the NIH open access policy make a wide range of material freely available. But researchers in the developing world should be wary of relying too heavily on western government largesse. Just as commercial publishers might discontinue subscription discount programmes, so could western governments limit access to the information resources funded by their taxpayers. This begs the question, then, whether governments in the developing world should impose their own open access mandates. Such initiatives could face political challenges, particularly in view of strong US and European positions against information “piracy” and compulsory licensing of intellectual property.

Given the challenges faced by researchers in the developing world, is open access publishing likely to advance their scientific work in a meaningful way? The answer is almost certainly “Yes”, though not without effort, and not without adjustments to traditional ways of thinking about scientific research and publishing in the developing world. Here are a few things that might help to improve the situation:

1. Increase the number and quality of south-focused scientific journals. While recent years have seen an increase in the numbers of online open access journals in developing countries such as Brazil, Egypt, and India, most such journals are not internationally recognised. It is not surprising that today the best scientists in the developing world submit their work to international journals. Leading universities and research institutions in the developing world must support locally-published journals, not only financially, but also through formal and informal recognition of researchers publishing in such journals.
2. Develop a “south-Elite” index to differentiate among developing world open access journals on the basis of quality. A selective south-focused open access journal index could include the top 10% to 20% of journals published in developing countries, or with developing country issues as their focus. The availability of such a “south-Elite” index could encourage existing international indexes to include developing world journals, and persuade leading researchers in the developing world to view publication in such journals as desirable.
3. Developing world researchers should pay greater attention to research emanating from the rest of the developing world. Researchers in the developing world still look primarily to the industrialised world for collaboration and information. For scientific production in the developing world to improve and gain broader recognition, researchers in the developing world must engage each other’s work and forge their own collaborations with each other.

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4. Develop new financial models to replace information philanthropy. Information philanthropy distorts information markets and influences behaviour in counterintuitive ways. Until it is supplanted by self-sufficient south-focused open access journals, the potential of developing world scientists will not be fully realised. Open access models have brought about significant changes in the world of scientific publication and knowledge dissemination. While such models have already had a positive impact on researchers in the developing world, more can be done to fulfil the promise of open access publishing for the global consumption and production of scientific research.

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