

Open access or no access

We would like to add to the current discussion¹, the peculiar quagmire Indian authors find themselves in because of the recent open access movement. Science clearly benefits from building on the work of other researchers and cannot be done in a vacuum. In the past, Indian scientists, besides getting research funding for their projects from donors, had to navigate this 'access' to the work of other researchers as another obstacle². The pay walls and article access fees were (and still are) especially difficult for smaller institutions and individual researchers. These access fees exist despite astronomical and ever-increasing profits made by major publishers (more than a billion euros for Elsevier³). Writing of review articles was practically impossible. Adding to this misery, even subsidized access programmes like the WHO-supported HINARI arbitrarily excluded India, a country with a large scientific community and a fifth of the global population.

The open access movement in scientific publishing was a welcome change in making science accessible to a larger community and it is seen as a great leveler of knowledge. However, the way this new open access model (where the author pays for free access to his/her work) has worked in practice, has been disappointing. There are a slew of new journals based on this model and it is difficult to differentiate between the genuine and the not-so-genuine peer-review process. This model has arguably also increased the inequity in scientific publishing with prohibitive publication fee for open access options. Some journals charge flat

rates of as much as US\$ 4750 per article⁴. Clearly, such money is beyond the payment capacity of independent Indian researchers and scientists from smaller institutions. Thus this open access has added another barrier of high publication fees.

In our field, i.e. public health, it has already been established that there is a dearth of research output from India. Of all the papers included in the largest health database – PubMed, only 1.64% (9066) had a first author from India in 2007 (refs 5 and 6). This probably is in some measure, due to the high publication fees in international journals. Additionally, some subjects are quite specialized and have a small dedicated audience and peer-reviewers. High access and publication fees is a barrier to Indian scientific participation in these niche areas, which goes against the 'open' spirit of science and the open access movement.

We add to the voice of the guest editorial¹ and call upon Indian research administrators to do away with this arbitrary artificial separation of Indian and international journals so that Indian researchers have all the more reasons to publish good research in Indian journals. Additionally, we also call upon the supporters of the open access journal publication movement to consider tiered pricing for publication fee. This could be linked to the purchasing power–parity adjusted GDP of the country. Currently, the flat US\$ 4750 publication fee is almost half an year's salary of an Indian academic (15 days salary of a US academic). Even budgeting this amount in research grants is difficult to justify as

the cost of publication would be more than the cost of doing the research itself! With a GDP-linked publication fee, this could be set at a flat cost of 15 days salary in different countries and seems a fair measure of the cost of publication. This model could even be applied to charges of articles in conventional journals. We also call upon conventional journal publishers to allow access to their content from India through the WHO-supported HINARI access programme.

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VEENA IYER
GULREZ SHAH AZHAR*

*Indian Institute of Public Health,
Public Health Foundation of India,
Sardar Patel Institute Campus,
Drive in Road, Thaltej,
Ahmedabad 380 054, India
e-mail: gsazhar@iiphg.org

Interdisciplinary research: way forward for biodiversity conservation

Increase in human population has been responsible for depletion of natural resources and loss of wildlife habitat, both directly and indirectly. It is acknowledged that interactions between humans and nature are responsible for creating critical and complex conservation challenges in both ecological and social

worlds and these are not resolvable through the knowledge acquired from a single discipline. It is time that a more holistic approach is adopted to address and understand the socio-economic dimensions of biodiversity conservation¹. Today, the issues and challenges relating to wildlife and biodiversity conservation

are embedded in understanding the human dimension with its social, cultural, political, economic and legal complexities². An interdisciplinary approach to challenges like that of human–wildlife conflict, will help scientists to arrive at better solutions that might ensure conservation of nature in the longer run³.

The necessity and merit of interdisciplinary approach, especially in the field of medicine and agriculture have been highlighted by Balaram⁴ and Rajagopal⁵. According to them, interdisciplinary approaches in research were not well defined in the 1980s. However, many years later institutes like the Central Plantation Crops Research Institute (CPCRI) and Indian Council of Agricultural Research (ICAR) have started to adopt them. For example, research on high-density multi-species cropping system involves expertise of scientists from various disciplines such as agronomy, plant breeding, soil-science, microbiology, entomology and plant physiology. Such a diverse approach is not restricted to the field of agriculture or medicine, but can also be applied to solve conservation issues like human-wildlife conflict.

Urbanization and conversion of land for agriculture have drastically reduced natural areas for wildlife and created an ecological imbalance. Competition for space and limited resources brings about human-wildlife conflict. The two key players, humans and wildlife have been studied independently by social and natural scientists, but rarely together until recently. Lack of understanding of the inter-relationships between wildlife and humans has created a lacuna in the field of biodiversity conservation. Campbell^{6,7} has pointed out many possibilities to reduce this lacuna.

Lélé *et al.*⁸ have highlighted four major barriers of interdisciplinary research

between natural and social scientists: (i) presence of value judgements in their work, (ii) following different theories and explanatory models for the same phenomenon, (iii) differences in epistemology, and (iv) involvement of interaction with the society at varying degrees. These barriers hinder the ability of combining the knowledge and experience of scientists from different disciplines to address conservation issues across different levels⁹.

According to McNeill *et al.*¹⁰, interdisciplinary research builds collaborations between researchers from different disciplines for which one needs to be not only knowledgeable in his/her own discipline, but must have respect and willingness to accept inputs from scientists from other fields in order to have a productive output. One has to remember that arguments merely decide 'who is right', while sincere discussions reveal 'what is right'. In today's scenario, we need sincere discussions to resolve the issues like human-wildlife conflict. Natural areas with wildlife need to be protected not just to meet the requirements of the people dependent on them for livelihood, but also to maintain ecological balance and the ecological services they provide¹¹. Such a goal can be achieved only by an interdisciplinary approach in order to address conservation problems from the point of view of the stakeholder, policy and governance¹⁰. Eventually it is a solution which is ecologically sound, economically viable and socially acceptable that

will help us achieve our conservation goals.

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PARAMESHA MALLEGOWDA

*Ashoka Trust for Research in Ecology and the Environment,
Royal Enclave,
Sriramapura, Jakkur PO,
Bangalore 560 064, India, and
Manipal University,
Manipal 576 104, India
e-mail: param.gowda@gmail.com*

'Envirotoons': an impressive way to environmental awareness

A cartoon has an intrinsic ability to catch everyone's attention and is sometimes more effective than words. The well-studied learning behaviour of humans shows that communication through cartoons is one of the most effective methods to convey a message. This method can be used to discuss even complex scientific concepts with people – whether students in a classroom or lay persons. Although any idea in science can be explained through cartoons, they have particular utility in understanding environmental science because of the interdisciplinary nature and universal significance of the

subject. A cartoon having content related to environmental science can be popularly called an 'envirotoon', which is about much more than just having fun. It can deliver the essence of an environmental phenomenon or concept in an understandable manner.

Today, improvement and maintenance of environmental quality has become one of the prime global objectives of all nations, including India. As an effort to protect our environmental wealth, the subject has been included in almost all the academic syllabi in our country. The prime objective of this attempt is to

make students environmentally conscious. Not just students, now it is time that everybody has to be aware of certain important local and global environmental issues, like anthropogenic impacts on the environment, and the management practices we employ for environmental health improvement. Until people understand the importance of environmental protection and participate in conservation campaigns, the scenario cannot be changed. Making people aware about the environmental impacts of their activities will indirectly help in improving environmental quality. In such efforts, utilization