Open access and impact factors

The year 2012 has so far been a favourable one for the global open access (OA) movement. It began with a successful campaign to have a proposed bill called the Research Works Act withdrawn from the US Congress. Had the bill been passed, it would have apparently nullified the open access initiatives in the US. About a month ago, Harvard University expressed its inability to subscribe to journals of certain publishers as they are too expensive and has asked its researchers and faculty to consider open access journals for publishing their works. CalTech, MIT and others also have asked their researchers and scientists to consider open access publishing. In the UK, the recently released Finch Report urges funders of UK research to encourage scientists to publish their results in open access journals. The report has received its share of support with major funding bodies such as Wellcome Trust supporting the cause of open access[1].

The recent editorial in *Current Science* has highlighted our overindulgence with impact factors (IFs) and brought into spotlight the new breed of money-making OA journals[2]. Despite Balaram's candid take on both these issues and also his cautionary closing line in the editorial – 'The assessors may do well to understand the limitations of journal metrics and dynamics of scientific publications', we look at the impact factor of journals before and after they took the open access route.

The case-in-point is CSIR–NISCAIR journals. The institute publishes 17 primary journals and on the First International Open Access Day on 14 October 2008, NISCAIR made two of its journals open access and by mid-2009 all its journals were available in this mode[3]. Going by the recently released Journal Citation Reports[4], for the first time two CSIR–NISCAIR journals have crossed IF 1, and as shown in Figure 1, almost all journals have increased their impact factors in 2011 over the previous years.

It appears that the increased 2011 IFs are a result of the journals having gone open access from 2008 to 2009 onwards.

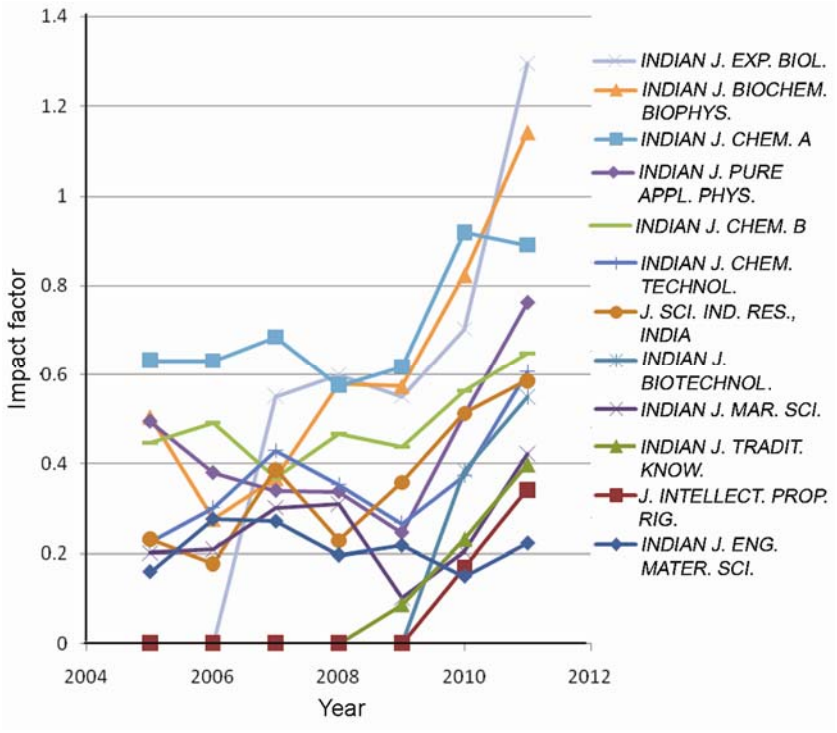

Figure 1. Impact factor trends of CSIR–NISCAIR journals.

1. Arunachalam, S., 2012; http://blog.niscair.res.in/?p=790
2. Balaram, P., *Curr. Sci*., 2012, **102**, 1617–1618.
3. http://nopr.niscair.res.in
4. Journal Citation Reports 2011, http://admin-apps.webofknowledge.com/JCR/JCR

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Management of scientific research institutions in India

Appointment of a director or a head in Indian research institutes is done by a selection committee. Based on experience in research, number of publications, and overall academic career, a senior scientist or an academician is considered for the post. However, not much emphasis is given to administrative skills or the understanding of financial matters for such a highly administrative post.

A director or a head shoulders a huge responsibility. An able head will have a clear vision for the development of an institute. Institutes in India are often headed by people who possess little or no administrative or leadership skills. This could be one of the reasons behind the dismal performance of research institutes in the country. This problem can be addressed by considering: (i) academic accomplishments, (ii) professional training

(for example, a formal training in management) and (iii) experience as a leader in addition to the academic qualifications while choosing a head (or director). A careful decision while appointing heads of institutes can help in development of these institutes and also induce a professional approach in the academic sector and enable utilization of the resources in an orderly manner. Due to lack of administrative, financial and leadership skills, most of the heads are unable to take confident initiatives or bold decisions.

In my opinion, this move shall streamline the use of discrete powers given to an administrative head. Secondly, it may help create a transparent work system.

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Research productivity of female research scholars and their migration pattern in pursuit of higher education and research

Although women comprise about 49% population of India, they constitute only 15% of the total manpower engaged in R&D in science and technology (S&T)[1]. Over the years, women enrolment in science at graduation level has improved and the percentage of women earning doctorates in biological and chemical science is now close to 50%. However, the ratio of women scientists entering the workforce is still low[1]. The gross enrolment ratio (GER) for higher education is 13% in India as compared to 23.2% of the world. The GER for higher education in India for females is reported to be 11% as compared to 15.3% in case of males. Gender disparities in the net enrolment ratio (NER) have also been reported[2]. Though the enrolment of women in professional courses has steadily increased from 12.35% in 2004–05 to 18.45% in 2008–09 (ref. 3), the enrolment of women in science was stagnant at 19.98% in 2008–09 in contrast to 20.18% in 2004–05 (ref. 3).

Low GER for higher education, societal compulsions, gender biases and presumably low research productivity are considered to be the possible reasons for lower representation of women in S&T. An attempt has been made here to analyse the research productivity of female research scholars in terms of publications in *Science Citation Indexed* (*SCI*) journals in comparison to their male counterparts and their migration pattern in pursuit of higher education and research.

Data on the number of research papers published by female and male CSIR research scholars during tenure of the scholarship, institutions from where they acquired their highest degree, institutions they worked during doctoral and postdoctoral research, subject specialization, and journal(s) in which they published their research work were extracted from 998 records (358 female and 640 male) belonging to the period from 2004 to 2009.

Analysis has revealed that 26% of female research scholars (358) published their research findings both in *SCI* and non-*SCI* journals, 11% in non-*SCI* journals and 63% in *SCI* journals. In comparison to female research scholars, 28% of male research scholars (640) published both in *SCI* and non-*SCI* journals, 9% in non-*SCI* journals and 63% in *SCI* journals.

Analysis further showed that 48% of 320 female research scholars who published in *SCI* journals were from Life Sciences followed by Chemical Sciences (28%), Physical Sciences (18%), Earth and Environmental Sciences (4%), Mathematical Sciences and Engineering and Technology (2%). Whereas 37% of the total *SCI* research papers (900) published by female research scholars were from the Chemical Sciences followed by Life Sciences (33%), Physical Sciences (24%), and 3% each in Earth and Environmental Sciences, and Mathematical Sciences and Engineering and Technology.

Similarly, 37% of 581 male research scholars who published in *SCI* journals, were from Life Sciences followed by Chemical Sciences (34%), Physical Sciences (19%), Earth and Environmental Sciences (6%), and Mathematical Sciences and Engineering and Technology (4%). Whereas 39% of the total *SCI* research papers (1793) published by male research scholars were from Chemical Sciences followed by Life Sciences (29%), Physical Sciences (24%), Earth and Environmental Sciences (5%), and Mathematical Sciences and Engineering and Technology (3%). The correlation analysis between the number of female or male research scholars and *SCI* research papers published was fairly positive (1.0).

Subject-wise research output in terms of number of research papers published indicates that in the area of Chemical, and Physical Sciences, female research scholars published 3.7 and 3.7 *SCI* research papers/scholar, in comparison to 3.6 and 3.9 *SCI* research papers/scholar respectively by their male counterparts, whereas in the area of Earth and Environmental Sciences and Life Sciences, female researchers published 2.0 and 1.9 *SCI* research papers/scholar, compared to 2.4 and 2.4 *SCI* research papers/scholar respectively by male research scholars.

Research papers published in non-*SCI* journals indicate that in the area of Chemical and Physical Sciences, female research scholars published 1.7 and 1.8 non-*SCI* research papers/scholar, in comparison to 1.8 and 1.7 by male research scholars respectively, whereas in the area of Earth and Environmental Sciences and Life Sciences, female research scholars published 2.0 and 2.0 non-*SCI* research papers/scholar in comparison to 2.0 and 2.2 non-*SCI* research papers/scholar respectively, by male research scholars.

Data pertaining to female research scholars (320), who had at least one publication in *SCI* journals, showed that 71% were working in academic institutions including institutions of national importance and the remaining 29% were from R&D institutions.

Migration pattern of research scholars, who published in *SCI* journals, revealed that 65% female research scholars migrated from one institution to another compared to 62% of male research