

Standard of scientific research publications

During the period 1997–2001, Indian contribution in the field of science and technology was 77,201 research publications (2.13%)¹. In assessing the worth of a scientific paper, citation counts and impact factor (IF) analysis are considered as indicators. The data provided by the *Science Citation Index (SCI)* for such analysis do not include data from many Indian journals, because they do not meet the criteria for inclusion. Coverage of Indian agricultural journals in *SCI* is poor², and analysis of publications in the field of agriculture is difficult.

The National Academy of Agricultural Sciences (NAAS) has recently made an attempt to give ratings for scientific research journals based on IF, quality of papers, periodicity, circulation, etc. They assigned a rating of '4' for journals with IF ≥ 2 and of 3.5 for those titles with IF 1 to 1.9. Journals with IF 0.5 to 0.9 and <0.5 were assigned a rating of 3.0 and 2.5 respectively. Those Indian journals which were not covered by *SCI* but considered as important by NAAS, were also assigned a rating of 0.5 to 3.

According to the list prepared by NAAS, only 238 (16.3%) foreign journals could be assigned a rating of 4.0, whereas 292 (20%), 268 (18.35%) and 278 (19.04%) journals were rated 3.5, 3.0 and 2.5 respectively. Among the remaining 67 (4.59%), 134 (9.18%), 49 (3.36%) and 134 (9.18%) could be grouped between medium (2.0) to lowest (0.5; Figure 1a).

Among Indian scientific journals, only 229 were listed by the NAAS studies and none of the scientific journals from India could be assigned a rate of 4.0. Only one got a rating as high as 3.5 (0.43%); 10 (4.37%) and 31 (13.54%) got a rating of 3.0 and 2.5 respectively. The medium to low rating (of 2.0, 1.5 and 1.0) was shared by 21, 36 and 27 (9.17%, 15.72% and 11.79%) journals, whereas the lowest rating of 0.5 (44.98%) was assigned to as many as 103 out of 229 journals. Interestingly, at the international level, out of 134 journals with a rating of 0.5, Indian journals accounted for as many as 103 (Figure 1b). It is clear that the standard of publication in Indian journals is of the lowest rating, in spite of the fact that the country may boast of highest scientific manpower.

The number of agricultural research journals listed by NAAS was grouped into Foreign Agricultural Journals (FAJ) and

Indian Agricultural Journals (IAJ). Then they were grouped according to the ratings assigned earlier.

It is evident that only 6 (4.54%) foreign journals qualify for the rating of 4.0, whereas a maximum of 41 journals (31.06%) have a rating of 3.0 (Table 1). Only 4 out of 132 foreign journals have a rating of 1.0 and 0.5, accounting for as low as 3.03%. As against this, among the Indian agricultural journals, none has a rating of 4.0; only 6 journals could be rated under 3.5 and 3.0 (7.22%), while as many as 39 out of 83 journals (46.98%) fall under the lowest

rating of 0.5. It may be noted that most of the research journals published by the State Agricultural Universities have the lowest rating of 0.5. Even *Indian Journal of Agricultural Sciences* published by the ICAR has a rating of only 2.5. NAAS also listed *Current Science* under a rating of 3.0.

An analysis of research publications by an ICAR institute was done based on the rates provided by NAAS and it was noted that over a period of time, scientists published 1092 papers in 75 foreign (211) and 86 Indian (881) journals. Their preference

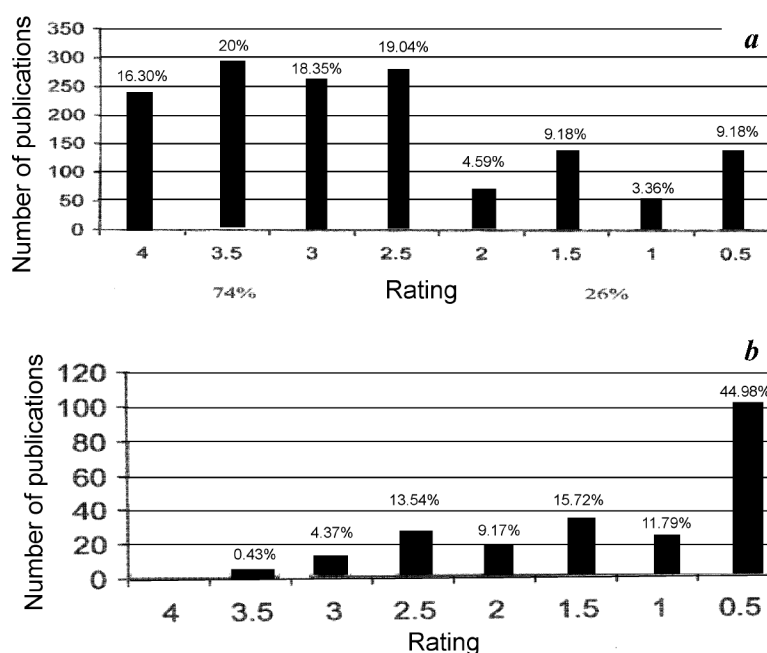


Figure 1. Rating of scientific journals (a) and Indian journals (b).

Table 1. Agriculture research journal according to NAAS

Rating	Foreign		Indian	
	Number	Percentage	Number	Percentage
4.0	6	4.54	0	0
3.5	25	18.93	1	1.20
3.0	41	31.06	5	6.02
2.5	36	27.27	11	13.25
2.0	6	4.54	7	8.43
1.5	14	10.60	12	14.45
1.0	3	2.27	8	9.63
0.5	1	0.76	39	46.98
Total	132		83	

was for crop-specific journals, both Indian and foreign. The trend of scientists to prefer journals which will be read by those working on the same crops, is justifiable. Balaram³ also opined that papers should be published where they are noticed by others in the field. Scientists published 450 papers in two Indian journals of rating 1.5 and 83 papers in three foreign journals of rating 1.5, 2.5 and 1.5 respectively. It should be admitted that neither the institute nor the scientist has ever given importance to the IF of journals which published research papers. The fact remains that some of the papers published in high IF journals may not be cited, while those in low-impact publications get cited³.

The comparative scenario between FAJ and IAJ (Table 1) calls for a total reform by the Indian scientific societies concerned with publication, to publish only peer-reviewed research papers. This perhaps may involve a thorough streamlining of the process of refereeing of journals, with guidelines on high rating of research papers.

To conclude, the Indian scientific journals fall much short of the ratings of international standards. There are many Indian journals which have the lowest rating. The rating of papers published in the journals at the organizational, divisional, personal (individual) levels indicates the level of research output, although done only for agricultural sciences as a case study for

an institute. Scientific academies/councils/societies have a role to upgrade the standard of scientific publication in the country.

1. King, D. A., *Nature*, 2004, **430**, 311–318.
2. Arunachalam, S., Srinivasan, R. and Raman, V., *Curr. Sci.*, 1998, **74**, 433–441.
3. Balaram, P., *Curr. Sci.*, 1999, **76**, 1519.

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The stages of scientists

I read with interest the editorial on the above subject¹. Relevant to this subject, I wish to share with the readers a quotation from Carl Jung and a conversation I had with the late S. Chandrasekhar, Nobel Prize winner in Astrophysics.

Jung wrote: 'A human being would certainly not grow to be seventy or eighty years old if this longevity had no meaning for the species to which he belongs. The afternoon of human life must have a significance of its own and cannot be merely a pitiful appendage to life's morning. The significance of this morning undoubtedly lies in the development of the individual, our entrenchment in the outer world, the propagation of our kind and the care of our children. But when this purpose has been attained – and even more than attained – shall the earning of money, the extension of conquests, and the expansion

of life go steadily on beyond the bounds of all reason and sense? Whosoever carries over into the afternoon the law of the morning – that is, the aims of nature – must pay for so doing with damage to his soul just as surely as a growing youth who tries to salvage his childish egoism must pay for his mistake with social failure. Moneymaking, social existence, family and posterity are nothing but plain nature – not culture. Culture lies beyond nature. Could by any chance culture be the meaning and purpose of the second half of life?'

I met Chandrasekhar sometime in 1990 when he was 80 years old and still continuing his work at the University of Chicago. While my wife and I were walking on the lawns of the Chicago University with him, he said that he received an invitation from the Dean of a reputed University in USA requesting him to come and stay at their

University for a few years, and that they would provide all facilities for his work. Professor said that he replied stating that in the Hindu religion it is said that after a certain age one should give up everything and go into 'vanaprasthashram' – withdrawing into the forest. The Dean's reply he said was interesting – it said that it would be possible to provide him with all facilities but providing a forest might be a bit difficult!!

1. Balaram, P., *Curr. Sci.*, 2004, **87**, 1319–1320.

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Lack of team spirit among scientists

There is an underlying implicit assumption in the lament 'The country produced Bose, Raman, Ramanujan and Saha, to name a few'¹ in the pre-independence era. My contention is the absence of potentially high quality students that is implicit in the above lament is erroneous and sets unre-

alistic reference levels to judge the decline in the quality of scientists produced in the country. The question to be asked is why did these stalwarts not succeed in raising a larger number of equally fine scientists for the leadership of the next generation, though they remain Indian icons even to-

day. It is unlikely that we are not producing many students who are equally bright or better, considering the large number of science graduates passing out of nearly 250 universities every year. In my opinion, such minds are not visible because they must now perform as members of a team