Impact Factor of Indian journals

Of the 47 Indian scientific journals that find place in the *Journal Citation Reports (JCR) on CD-ROM – 1999 Science Edition*, *Current Science* tops the tally amongst Indian journals with an Impact Factor (IF) of 0.567. It is not only the most cited Indian Journal (1766 citations in 1999), but also the largest journal in terms of number of articles (464) published during 1999. The other end of the 1999 spectrum includes the *Indian Journal of Agronomy* (lowest IF, 0.032), *IETE Journal of Research* (least cited with 7 citations) and *Journal of Astrophysics and Astronomy* (smallest journal in terms of number of articles, i.e. 6 during 1999). Specifically, only four journals received more than 1000 citations: *Current Science* (1766), *Indian Journal of Chemistry B* (1686), *Journal of the Indian Chemical Society*

Table 1. *Journal Citation Reports (JCR) on CD-ROM – 1999 Science Edition* journal rankings sorted by Impact Factor (Filtered by India)

Rank	Journal abbreviation	ISSN	1999 Total cites	Impact Factor	1999 Articles
1	*Curr. Sci. India*	0011-3891	1766	0.567	464
2	*Indian J. Biochem. Biophys.*	0301-1208	473	0.430	66
3	*J. Genet.*	0022-1333	595	0.419	14
4	*J. Biosci.*	0250-5991	257	0.370	59
5	*Indian J. Med. Res.*	0971-5916	904	0.365	71
6	*Natl. Med. J. India*	0970-258X	100	0.363	34
7	*J. Geol. Soc. India*	0016-7622	737	0.355	129
8	*J. Polym. Mater.*	0970-0838	186	0.352	36
9	*Indian J. Chem. B*	0376-4699	1686	0.346	310
10	*J. Plant Biochem. Biot.*	0971-7811	69	0.340	24
11	*Proc. Indian Acad. Sci. (Chem. Sci.)*	0253-4134	301	0.339	72
12	*Bull. Mater. Sci.*	0250-4707	299	0.319	158
13	*Indian J. Chem. Technol.*	0971-457X	135	0.317	57
14	*Indian J. Chem. A*		1382	0.304	268
15	*J. Astrophys. Astron.*	0250-6335	139	0.286	6
16	*Pramana – J. Phys.*	0304-4289	401	0.278	170
17	*Orient. Insects*	0030-5316	30	0.276	18
18	*Proc. Indian Acad. Sci. (Earth Planet. Sci.)*	0253-4126	133	0.229	17
19	*Indian J. Pure Appl. Phys.*	0019-5596	589	0.228	169
20	*J. Appl. Anim. Res.*	0971-2119	59	0.214	55
21	*J. Sci. Ind. Res. India*	0022-4456	319	0.201	101
22	*J. Indian Chem. Soc.*	0019-4522	1422	0.192	166
23	*Bull. Electrochem.*	0256-1654	251	0.165	77
24	*Indian J. Heterocycl. Chem.*	0971-1627	136	0.163	85
25	*Asian J. Chem.*	0970-7077	205	0.159	283
26	*Sadhana – Acad. Proc. Eng. Sci.*	0256-2499	52	0.144	21
27	*Indian J. Fibre Text*	0971-0426	62	0.137	39
28	*J. Camel Pract. Res.*	0971-6777	31	0.132	28
29	*Indian J. Eng. Mater. Sci.*	0971-4588	36	0.126	56
30	*J. Food Sci. Technol. Mysore*	0022-1155	474	0.112	107
31	*IETE Tech. Rev.*	0256-4602	33	0.108	20
32	*J. Environ. Biol.*	0254-8704	73	0.107	68
33	*Indian J. Anim. Sci.*	0367-8318	744	0.101	361
34	*Indian J. Pure Appl. Math.*	0019-5588	194	0.098	124
35	*Defence Sci. J.*	0011-748X	55	0.086	49
36	*IETE J. Res.*	0377-2063	7	0.080	8
36	*Indian J. Mar. Sci.*	0379-5136	354	0.080	87
38	*Ann. Arid Zone*	0570-1791	59	0.078	
39	*Indian J. Agric. Sci.*	0019-5022	392	0.076	251
40	*Neurol. India*	0028-3886	90	0.057	79
40	*Trans. Indian Inst. Met.*	0019-493X	133	0.057	45
42	*Indian Vet. J.*	0019-6479	625	0.050	372
43	*Natl. Acad. Sci. Lett.*	0250-541X	72	0.048	23
43	*Proc. Indian Acad. Sci. (Math. Sci.)*	0253-4142	61	0.048	40
45	*Met. Mater. Process*	0970-423X	9	0.045	
46	*J. Adv. Zool.*	0253-7214	24	0.036	13
47	*Indian J. Agron.*	0537-197X	328	0.032	48

Source: *Journal Citation Reports (JCR),* Institute for Scientific Information, Philadelphia, USA.

Table 2. Impact Factor of *Current Science* (1990–1999)

Year	Impact Factor
1999	0.567
1998	0.515
1997	0.376
1996	0.364
1995	0.292
1994	0.271
1993	0.376
1992	0.253
1991	0.126
1990	0.076

Source: *Journal Citation Reports (JCR)*, ISI, Philadelphia, USA.

(1422) and *Indian Journal of Chemistry A* (1382), and 15 journals published more than 100 articles during 1999 (Table 1).

It is indeed creditable that *Current Science* is slowly approaching the magic IF figure of 1.000, it being just 0.076 in 1990 (Table 2).

The *JCR on CD-ROM – 1999 Science Edition* covered a total of 5550 scientific journals, including 47 from India, *Annual Review of Immunology* being the top-ranking journal in terms of IF (47.564). The coverage of Indian journals in the *JCR on CD-ROM – 1995–1998 Science Edition* was as follows: 42 Indian journals out of a total of 4623 in 1995, 38 of 4779 in 1996, 37 of 4963 in 1997 and 51 of 5467 in 1998.

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A case for History and Philosophy of Science in Indian universities

Indian universities have failed to establish full-fledged departments of History and Philosophy of Science. Indians were the forerunners in the field of Astronomy and Mathematics. There are at least half a dozen centres of research in Europe and America, which specialize in oriental studies, but hardly any in Indian universities. What are the reasons for this neglect?

We have a National Commission on History of Science to promote education and research in Indian universities. It was set up jointly by University Grants Commission (UGC) and Indian National Science Academy (INSA), New Delhi under the guidance of D. S. Kothari. A national workshop was held in September 1974 at INSA, New Delhi to prepare a draft proposal for implementation of History of Science programme in Indian universities. As a consequence, some half a dozen universities started teaching History of Science courses at various levels. The prominent among them were Delhi University, Aligarh Muslim University, BITS Pilani, Guru Nanak Dev University and Panjab University. This experiment failed after a few years, as there was neither demand for this course nor support from UGC or INSA for providing infrastructure to the universities.

INSA had a one-man cell to carry on History of Science programme in India under the National Commission. It brings out *Indian Journal of History of Science* with contributions from historians of science from both India and abroad. It highlights the Indian contribution in science and technology to the world civilization. Research projects are offered by INSA to Indian scholars and some financial support is provided to publish their reports. But there is no concerted effort made to set up chairs in some universities to promote teaching and research. INSA has published more than a dozen volumes on various aspects of Indian History of Science and Technology. Jamia Hamdard, New Delhi also brings out a Journal *Studies in History of Medicine and Science* and published some treatises on the ancient system of medicine. The Indian Society for History of Mathematics has been quite active and brings out its journal *Ganita-Bharti*, *Bulletin of Indian Society of History of Mathematics*. During 1974, Indian Association for History and Philosophy of Science (IAHPS) came into existence with V. R. Shastri as its founder general secretary. It organized some meetings at ISCA venues as an annual ritual, but failed to make an impact.

In my view, History and Philosophy of Science is an important area of knowledge, which needs to be promoted as an academic discipline in our colleges and universities. From my experience as a teacher of science, the students are quite responsive and evince a keen interest in the topic when its history is narrated as introduction to a topic. It adds flavour to the otherwise dull and drab routine teaching based on abstract mathematics. Philosophy of Science is a topic for serious students only and the response was lukewarm. History and Philosophy of Science should be introduced as an inter-disciplinary course for students of science and humanities. It will broaden the vision of non-science students and create a scientific temper in young minds. A case for introduction of these topics in academic curricula of Indian universities should be prepared by the National Commission on History of Science.

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Modernization of agriculture – A boon or bane?

Food is the one need of humanity, which has no compromise. Availability of sufficient food alone can make room for the developmental leaps in any other field. In the pursuit of feeding the fast-growing human population and guarding the erosion of natural resources, technically innovative measures were launched. Due to these efforts, food production per capita could keep pace with the population boom. But for these innovative measures many people might have starved to death. While appreciating the remarkable success, it is also important to understand some of its external costs, in order to assess the true benefits of agriculture modernization. The subject has been discussed elaborately by Jules[1].

The main objective of modernization of agriculture is the need for increased food production for which, traditional agriculture is transformed by adoption of modern varieties of crop and livestock, and external inputs (such as fertilizers, pesticides, antibiotics, credit machinery, etc.) necessary to make these productive. Infrastructure such as irrigation schemes, roads and markets, guaranteed prices and markets for agricultural produce as well as range of other policies has supported this also.

Modern varieties of staple cereals mature quickly, permitting two or three crops to be grown each year. As a result, average yield of cereals has roughly doubled in 30 years. This average does, however, hide significant regional differences. In south-east Asia, food production per capita has increased by about 30 per cent, but in Africa it has fallen by 20 per cent. This apart, genetic erosion, the reduction of diversity within a species is a global threat to agriculture. Secondly, traditional varieties and breeds are displaced. During the twentieth century, varieties about 75 per cent of the genetic diversity of agriculture crops have been lost. In India where once more than 30,000 rice varieties were grown, now just 10 varieties cover 75 per cent of the entire rice area.

Mixtures of traditional varieties did give some insurance against pest and disease attack. Outbreaks and resurgence are more likely to occur when the landscape is simplified to contain just a single crop. Application of pesticides in an attempt to prevent pest damage, can cause outbreaks and resurgence, since natural enemies that control pests are killed. Pesticides at very high doses may be lethal to both laboratory animals and human beings, causing severe illness at sublethal levels.

Modern varieties are highly responsive to fertilizers. This has led to indiscriminate use of fertilizers. These inputs never used entirely or efficiently by the receiving crops or livestock, are lost to the environment, contaminating water, food and fodder, and the atmosphere. Water is often wasted or used inefficiently, leading to ground water depletion, water logging and salinity problems.

Previously, under the traditional agriculture system farmers maintained cattle and poultry, and included planting green manure crops in rotation. The green leaf manure, trees and hedges bind the soil and provide valuable fodder, fuel wood and habitats for predators of pests. These sources of nutrition are often cheaper, more efficient than inorganic fertilizers and focus on recycling of nutrients. There was little distinction between products and byproducts. In modern agriculture, factors have sidelined livestock, likewise fossil fertilizers have belittled organic manners. This in turn altered the C : N ratio of soil creating physiological hunger in plants, which means no linear increase in yield together with wastage of applied fertilizers involving huge costs.

Earlier farmers enjoyed self-sufficiency altogether. They cultivated traditional varieties that were often resistant to pest, diseases and drought. Phenotypically superior seeds were hand-picked from the field, processed and protected from pests and diseases during storage, using locally available pest-repellent plants. Farm yard manure, green and green leaf manure were used for fertilization, which were usually low or no cost strategies. They also maintained the fertility, in terms of C : N ratio and soil structure. Though the yield could not match those of modern varieties, the risk was low because any of the natural disasters like drought or pest breakdown would mean much more loss in modern agriculture, unlike the traditional one.

The second main objective of modernizing agriculture is to minimize soil erosion. Ironically, many programmes have actually increased the amount of soil eroding from farms. This is because achievements have mostly been short-lived. The lack of consultation and participation of the local people whose lands are being rehabilitated, find themselves participating for no other reason than to receive food or cash. Seldom are the structures maintained, so construction work rapidly deteriorates, accelerating erosion.

The assumption of universality of technologies has led to greater standardization and homogenization. The world so created is inevitably monotonous. Modernization has isolated a type called ‘forgotten agriculture’. These are low external input systems and are located in dry land, swamps, upland, fragile and problem soils. Farming system in these areas is complex and diverse. Agricultural yields are low and these areas are less likely to be visited by agricultural scientists and extension workers. The poorest countries tend to have higher proportion of these agricultural systems. Most of the food production in Africa comes from these low external input systems of agriculture, yet these people are currently excluded from agricultural policies that focus on the high potential lands. Hence we have been losers as well as winners, due to agricultural modernization. Therefore new processes are needed, as most modern external packages are financially costly for developing countries and their farmers and cannot do anything to rejuvenate the forgotten agriculture. Only low-cost technology and practices can be applied on a scale wide enough to improve the livelihood of some 2 billion people. This will require the adoption of an entirely different approach to agricultural development.

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Legal protection for biotech trials

More and more field experiments and production practices indicate that transgenic plants possess many merits. Up to now, insect-resistant and herbicide-resistant transgenic cotton, maize, soyabean, etc. have been widely planted in many countries.

However, the events that destroy transgenic plant trials and their experimental equipment often happen worldwide. In India, farmers protesting against genetically engineered crops destroyed at least seven sites in southern India that were testing transgenic varieties of cotton developed by the US company, Monsanto[1,2]. In Australia, the 'Free Seed Liberation' destroyed ~ 100 genetically modified (GM) experimental pineapples that produce higher levels of proteins, vitamins and sugars[3]. In USA, radical activists recently destroyed corn, sugar beet, sunflower, walnut trees, melons, tomatoes and greenhouses and irrigation equipment at sites belonging to the Davis and Berkeley campuses of the University of California, the commercial companies Pioneer Hi-Bred and NK Seeds and elsewhere[4]. They wanted to kill the transgenic plants in the bud.

These destructions severely hamper transgenic plant trials and their applications. Only law can prevent such anti-biotech activists from destroying the transgenic plant experiments. The public have to be educated about GM organisms and the destroyers of transgenic plants and trials will be have to be punished.

However, transgenic plants may also be subjected to unknown environmental and ecological risks (although, up to now, no evidence of risk has been found). Thus, GM trials must be monitored, transgenic products must be labelled before being released into the market, and potential risks must be estimated. It is only fair to make these obligations enforceable by law as well[5].

Recently, a committee of the California State Assembly approved, under the proposed legislation, that anyone who destroyed the transgenic plant trials and affiliated equipment will be liable for civil penalty[4]. This is a good beginning. Other states and countries should follow this example, and make laws for protecting and monitoring transgenic plant trials.

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NEWS

President Putin's recent visit to India: The road ahead for Indo-Russian Science and Technology cooperation

Present status

The 'Declaration on strategic partnership between India and Russia' was signed on 3 October 2000 at New Delhi by the visiting Russian President, Vladimir Putin and the Indian Prime Minister, Atal Behari Vajpayee. The Declaration affirmed 'to proceed from a desire to further consolidate their traditionally close and friendly ties to mutual benefit; drawing upon their rich and fruitful tradition of cooperation in various fields accumulated over half a century since their establishment of diplomatic relations . . .'.

In Science and Technology (S&T), Russia and India agreed to intensify co-operation and provide for extension of Integrated Long-Term Programme of Co-operation in Science and Technology (ILTP) up to the year 2010. This agreement was signed by Murli Manohar Joshi, Minister for Human Resource Development, Science and Technology and Ocean Development, Govt of India and Ilya Klebanov, Deputy Prime Minister of the Russian Federation on 3 October 2000, in the presence of Prime Minister of India and the President of the Russian Federation. The agreement provides for 'industrial and commercial exploitation of high technologies emerging out of joint research and development as well as those available with either side'. A mechanism for technology transfer and high technology joint ventures was also agreed upon. It was further agreed to set up an Indo-Russian Joint Council for ILTP that would oversee the joint ventures and technology transfers.

Background to the ILTP

It has been 13 years since the first signing of the ILTP on 3 July 1987 by the then Prime Minister of India and General Secretary of CPSU. Political changes