# Scientometric analysis of *Current Science*

*Marisha*

*This article presents a scientometric analysis of Current Science. The publications of the journal have been analysed for a 28-year period (1990–2017). Several different parameters such as output pattern, collaboration trend, citation pattern, contributing countries and organizations, highly cited papers, etc. have been analysed. Graphs of keyword co-occurrences have also been generated to analyse the important themes of research and their trends over the years. The journal has been in existence for more than 85 years and, according to our knowledge there have been no earlier attempts towards its scientometric characterization. We find that the journal output has increased over the years. The authorship trend is found to be towards multi-authored papers. A fair percentage of the publications in the journal is cited. The rate of international collaboration is, however, not very high and most of the publications in the journal are from India. Major change is observed in the themes and trends of content published in Current Science during the study period, although the journal has remained India-focused.*

**Keywords:** Bibliometrics, *Current Science*, research themes and trends, scientometric analysis.

SCHOLARLY journals act as the most important source for understanding research and development in any discipline. This is the reason that such journals have historically been an important unit of bibliometric and scientometric analyses. Various techniques have been employed for analysing scholarly journals such as peer evaluation, citation analysis, analysis of journal contents, etc. The impact factor (IF), which is the ratio of the citations received within a two-year window to the number of publications during the same period, is also a commonly used measure of the impact or quality of a journal. Several other citation-based metrics such as the SCImago Journal Rank (SJR), Source Normalized Impact per Paper (SNIP) and CiteScore have also been developed. The *h*-index although developed originally as an author-level metric is also frequently applied for journals. Keyword-based analyses applied to journals help in finding out the themes and trends of research in a discipline.

*Current Science* is the leading multidisciplinary science research, and news and views journal in India. It was started 15 years before India's independence from British rule. The following statement has been quoted from the journal website: 'It was started in 1932 by the then stalwarts of Indian science such as C. V. Raman, Birbal Sahni, Meghnad Saha, Martin Foster and S. S. Bhatnagar' (https://www.currentscience.ac.in/php/about.php). However, a historical perspective by Krishnan and Balaram[1] on the 75th anniversary of *Current Science* paints a different picture. We get to know that the stalwarts of science mentioned in the website assured the journal of their support, but were not instrumental in starting it. This note by Krishnan and Balaram is discussed in some detail here.

In 1932, when *Current Science* was born, some Indian scientists had already made their mark on the international scene. Along with their involvement with the growing freedom movement, was a desire to excel in science. C. V. Raman had published his work in atomic physics and had been awarded the Nobel Prize shortly thereafter in 1930. There was an environment of excitement with the achievements of M. N. Saha and S. N. Bose. The schools of learning by J. C. Bose and P. C. Ray led to a renaissance of science in India, of which Calcutta (now Kolkata) was the focal point. It was in this atmosphere that discussions on a journal to be published from India were first mooted in the Science Congress of the 1920s. A questionnaire was circulated by the then Director of Indian Institute of Science (IISc), Bangalore (now Bengaluru), M. O. Forster, on the need for a journal, and a year later in July 1932, *Current Science* was started. C. R. Narayan Rao was its first editor (he remained till 1942), and was primarily responsible for shaping the journal. The early issues invariably carried an Editorial covering both scientific and social issues. There followed a series of editors, all distinguished scientists, whose impact on the journal and its evolution needs to be studied. It is interesting to note that Narayan Rao befriended the editors of both *Nature* (Richard Gregory) and *Science*, in an effort to establish/develop a high-quality journal along the same lines. Later in 1936, Gregory mentioned to Mirza Ismail and Ernest Rutherford at a dinner in London that,

Marisha is in the School of Science, UP Rajarshi Tandon Open University, Prayagraj 211 021, India.
e-mail: tmarisha17@gmail.com

'(*Current Science*) brought great credit to India. I have seen nothing comparable with it was published in any part of the world outside India and that it deserved the fullest support from every point of view. I said this because I know it is true and not because I wish to support you in your effort[1].'

*Current Science* is published fortnightly and in collaboration with the Indian Academy of Sciences, Bengaluru. Apart from research articles and review papers, the journal also publishes scientific correspondence, news, comments, opinions, book reviews, etc. It also publishes special sections on a wide range of topics. The journal is indexed by a number of bibliometric databases such as Web of Science (WoS), Scopus, IndMed, Geobase and Chemical Abstracts. It is among the most reputed journals published from India. Here, we have performed a detailed scientometric-based analysis of *Current Science*. A number of parameters have been evaluated and the results provided.

## Related work

Scientometric analysis of journals has been performed by many previous studies. Some of them did collective analysis of the important journals published in a discipline to identify general trends of publication, collaboration, citation practices, authorship, etc. while some others have focused on analysing impact of the journals. Beljecki *et al.*[2] analysed selected Geographical Information Science journals based on metadata downloaded from Scopus to identify publication pattern, citation impact, geographical distribution, collaboration trends, etc. They also used Altmetric and Mendeley for analysis of readership of the GIScience journals. Davarpanah *et al.*[3] studied a group of journals publishing in Library and Information Science (LIS). They identified 56 such journals from Social Science Citation Index and analysed their publications for the period 2000–2004.

Studies analysing the impact of journals of a particular discipline have either been based on citation analysis or reader survey, or in some cases a combination of both techniques. Lowry *et al.*[4] used reader survey for ranking the business and technical communication journals. They also analysed the impact of region and department of researchers on the perceived quality of journals, and identified the most read journals. The authors found that journal rankings tend to differ based on world regions and academic departments[4]. Schloegl and Stock[5] used both citation analysis and reader survey for identifying the impact of LIS journals. They also analysed the correlation between different survey parameters and citation indicators. The authors observed different correlation trends among reader survey and citation parameters for international LIS journals and German-language-specific LIS journals[5].

Scientometric characterization of individual journals has also been the subject of research in a number of disciplines. Andrikopoulos and Trichas[6] analysed the *Journal of Corporate Finance* on aspects such as publication pattern, co-authorship, editorial board characteristics, etc. They also used co-authorship networks for identification of the most central authors[6]. Dutt *et al.*[7] analysed the journal *Scientometrics* on a variety of parameters. The analysis was based on the metadata of publications of the first 50 volumes of the journal. They identified main themes of publications, distribution of publications by country, country-wise emphasis on research themes, most productive institutions and co-authorship patterns. The research themes of papers was identified manually by categorizing the publications into seven broad themes. Nishy *et al.*[8] analysed the *Indian Journal of Chemistry* based on publications between 2005 and 2009. The analysis focused on finding geographical distribution of papers, citation analysis, authorship patterns, referencing patterns, important sources of references and subject analysis of papers. Again, subject analysis was done by manually categorizing the publications into four main fields of chemistry that were further sub-divided into 45 categories and the number/percentage of papers in each category was identified.

Analysis of journals is not just limited to general scientometric profiling; specialized studies on identification of major themes of research and their trends over the years have also been common in the literature. Such studies primarily utilize the author keywords and words extracted from the abstract and title of a paper for analysis. Some studies have also used related keywords from other sources in order to increase the vocabulary for analysis. Ravikumar *et al.*[9] performed a co-word-based analysis for mapping the intellectual structure of *Scientometrics*. They used text mining and co-word analysis techniques and identified the research trends with special focus on dynamic changes in the field of scientometrics. Young *et al.*[10] used the Laximancer tool to perform text-based analysis of the *Journal of Business-to-Business Marketing*. The main aim of the study was to identify the key concepts of business research and their relationship.

While most such studies focused on discipline-specific journals, Arkhipov[11] did a scientometric analysis of *Nature*. He analysed the distribution of articles according to subfields. His analysis was based on the average age of the employed instruments. The study also confirmed the correlation between the growth in the number of articles published in the journal and the methodology applied for treatment of data.

## Objectives of the study

The present study was conducted with the objective of analysing *Current Science* on various bibliometric parameters, viz. (i) publication pattern and rate of growth, (ii) impact of the journal as measured from citations, (iii) pattern of international collaboration, (iv) highly cited papers, (v) major contributing organizations and countries and (vi) major research themes over the years.

## Methodology

For this study, the metadata of publications of *Current Science* were collected for the 28-year period (1990–2017) from WoS (http://webofknowledge.com/) using the query (IS=0011-3891) Timespan: 1990–2017. Indexes: SCI-EXPANDED, SSCI, A&HCI, ESCI. Although *Current Science* has been in existence since 1932, the metadata accessible to us through WoS are from 1989 only and therefore, the period from 1990 to 2017 was chosen. The complete metadata collected from WoS have a total of 18,897 records, of which 50.78% are articles (9596), 18.81% letters (3555), 12.64% editorial material (2388), 5.99% news item (1132), 3.88% review (734), 3.63% notes (685) and 2.40% are bibliographic items (454). The remaining types of publications account for less than 1% of the total output. As the main purpose of this study was to evaluate research papers in the journal, we have considered only Article and Review type papers for further analysis, which were obtained by limiting the search query to Article and Review type records only. These together constitute 10,330 records and account for around 55% of the total output of the journal during the study period (1990–2017). All the data have been retrieved as on 4 November 2018. The other types of publications will be analysed subsequently.

The measures directly obtained from the data are total papers (TP) and total citations (TC). Other parameters that have been calculated from the data are average citation per paper (ACPP), median citation count (MC), normalized citation impact indicator (NCII), international collaborative publications (ICP), highly cited papers (HiCP), number of single (SA) and multi-authored (MA) papers, average number of authors per paper (AAPP), etc. The average citation per paper (ACPP) is calculated by dividing the total number of citations received collectively by a set of publications by the total number of publications in the set. A research paper is considered to be an instance of international collaborative publication if, the authors of the paper have affiliation from at least two different countries with India as one of them. ICP indicate the outreach of the journal. Different countries contributing to the journal output have also been examined. HiCP are those that constitute the top 1% of the total cited papers, i.e. the 99th percentile.

For calculating all types of indicators, the full counting method has been used. Thus, for example, if a publication has authors from three different countries, then one publication count is credited to each of the contributing countries. Similarly, in the case of citations, if a paper has received *n* citations, then *n* citations each are credited to the authors as well as to their countries and institutions of affiliation. Further, the citation counts have been retrieved from the date of publication of a paper to the date on which the data have been retrieved and therefore, older publications tend to have a larger citation value compared to the newer ones. For reducing the impact of age of a publication, NCII has been calculated[12]. The NCII value of a publication is obtained by dividing the total number of citations received by a publication by the age of the publication. For each year's entry, the total number of citations received collectively by the publications that appear in the same year in the journal is divided by the age of the publications in 2018, in order to obtain the year-wise NCII values for the journal.

## Results and discussion

### *Publication pattern*

Table 1 shows the year-wise distribution of various indicators. As can be seen from the table, the total number of publications shows uneven growth during the period of study. A clear increase in the number of publications can be seen after mid-1990s; however, the growth is not continuous. The number of publications each year lies between 300 and 500 for a large part of the study period. Figure 1 shows the pattern of publications of the journal over the years. It can be seen from the figure that output count values remain close to 500 after the year 2014.

### *Citation and impact*

Table 1 indicates the total citation received by the publications of *Current Science* during 1990–2017. As can be seen from the table, more than 1000 citations have been received by the publications of the journal each year, barring a few entries at the beginning and end of the study period. A particularly interesting case is that of 1994, when fairly less number of citations has been received even though the number of publications is close to that of the neighbouring values. The highest citation values can be seen during the period 1999–2006. In Table 1, ACPP is highest for 2005 (16.08). For publications during 1999–2006, the average citation values are very high and remain in double digits; thereafter, a decreasing trend is observed.

Since the citation counts from WoS are collected for the whole period for a publication, i.e. from the date of publication to the date of download of data, older papers have advantage over new ones as they have a longer time window for getting cited. NCII gives the ratio of total citations received by the publications and their age, and is therefore a better indicator for understanding the impact of publications of the journal. Figure 2 (secondary vertical axis) indicates the pattern of NCII values during 1990–2017. As can be seen from the figure, the NCII values show an overall increasing trend during 1990–2006,

**Table 1.** Year-wise values of different indicators

| Year | Output | Citation | ACPP | Cited (%) | MC | NCII | SA | MA | AAPP |
|---|---|---|---|---|---|---|---|---|---|
| 1990 | 136 | 553 | 4.07 | 55 | 1 | 19.75 | 88 | 48 | 1.67 |
| 1991 | 171 | 886 | 5.18 | 59 | 1 | 32.81 | 112 | 59 | 1.80 |
| 1992 | 128 | 982 | 7.67 | 66 | 2 | 37.77 | 75 | 53 | 1.77 |
| 1993 | 200 | 1333 | 6.67 | 67 | 2 | 53.32 | 123 | 77 | 1.74 |
| 1994 | 201 | 633 | 3.15 | 48 | 0 | 26.38 | 126 | 75 | 1.68 |
| 1995 | 224 | 1284 | 5.73 | 63 | 1 | 55.83 | 105 | 119 | 2.07 |
| 1996 | 358 | 3140 | 8.77 | 77 | 3 | 142.73 | 89 | 269 | 2.73 |
| 1997 | 337 | 2909 | 8.63 | 79 | 3 | 138.52 | 97 | 240 | 2.41 |
| 1998 | 389 | 2687 | 6.91 | 79 | 3 | 134.35 | 101 | 288 | 2.69 |
| 1999 | 464 | 5012 | 10.80 | 81 | 3 | 263.79 | 122 | 342 | 2.66 |
| 2000 | 446 | 6418 | 14.39 | 85 | 6 | 356.56 | 122 | 324 | 2.74 |
| 2001 | 465 | 6468 | 13.91 | 88 | 6 | 380.47 | 114 | 351 | 2.96 |
| 2002 | 404 | 6722 | 16.64 | 93 | 8 | 420.13 | 73 | 331 | 3.07 |
| 2003 | 436 | 6177 | 14.17 | 93 | 7 | 411.8 | 77 | 359 | 3.06 |
| 2004 | 476 | 7432 | 15.61 | 92 | 7 | 530.86 | 77 | 399 | 3.14 |
| 2005 | 537 | 8636 | 16.08 | 91 | 7 | 664.31 | 118 | 419 | 3.12 |
| 2006 | 461 | 6810 | 14.77 | 93 | 7 | 567.5 | 54 | 407 | 3.44 |
| 2007 | 484 | 4691 | 9.69 | 90 | 6 | 426.45 | 70 | 414 | 3.38 |
| 2008 | 386 | 3183 | 8.25 | 87 | 4 | 318.3 | 61 | 325 | 3.10 |
| 2009 | 378 | 3013 | 7.97 | 86 | 4 | 334.78 | 72 | 306 | 3.39 |
| 2010 | 355 | 2345 | 6.61 | 88 | 4 | 293.13 | 58 | 297 | 3.39 |
| 2011 | 373 | 2232 | 5.98 | 83 | 4 | 318.86 | 53 | 320 | 3.57 |
| 2012 | 285 | 1666 | 5.85 | 84 | 3 | 277.67 | 45 | 240 | 3.40 |
| 2013 | 347 | 1608 | 4.63 | 82 | 2 | 321.6 | 38 | 309 | 3.99 |
| 2014 | 356 | 1348 | 3.79 | 76 | 2 | 337 | 58 | 298 | 6.39 |
| 2015 | 505 | 1123 | 2.22 | 68 | 1 | 374.33 | 82 | 423 | 3.78 |
| 2016 | 493 | 540 | 1.10 | 49 | 0 | 270 | 49 | 444 | 3.74 |
| 2017 | 535 | 259 | 0.48 | 28 | 0 | 259 | 57 | 478 | 3.80 |

ACPP, Average citation per paper; MC, Median citation count; NCII, Normalized citation impact index; ICP, International collaborative publications; SA, Single authored papers; MA, Multi-authored papers; AAPP, Average authors per paper.

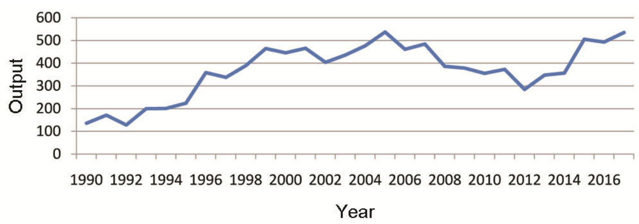


**Figure 1.** Publication pattern (1990–2017).

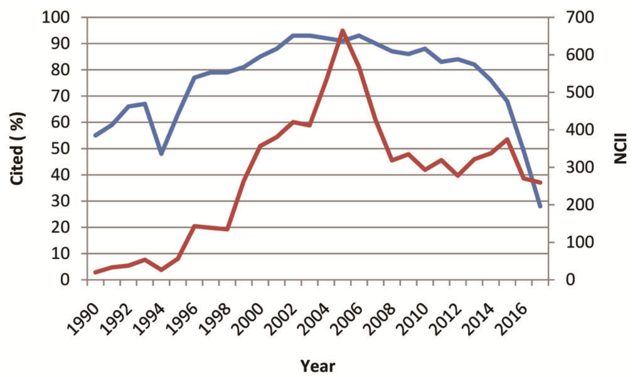


**Figure 2.** Normalized citation impact indicator (NCII) and cited percentage (1990–2017).

achieving the peak value in 2006. A decreasing trend is observed after 2006, with slight recovery after 2014. A close observation of the pattern reveals that the NCII values are highest for the period 2002–2007. The age of publications occurring between 2002 and 2007 would be 11–16 years in 2018. It means that publications older than this gradually stop receiving new citations and therefore the NCII values are lower for publications between 1990 and 2001, while publications with age less than 10 years might not have received more citations because they are relatively young. Thus, we may conclude that the papers tend to become obsolete after about 15–16 years of publication. Although there are papers that continue to receive citations after many years of publication, the trend of papers becoming obsolete after a certain time-period has been observed in previous studies as well[13]. Similarly, MC values in Table 1 are high for publications between 2000 and 2007.

Figure 2 (primary vertical axis) shows the graph showing the year-wise percentage of papers that are cited at least once. It can be seen that about 20% of the papers remain uncited for most part of the 28-year period, while the level of uncitedness reaches up to 60% for the year 1994. Further, more than 90% of the papers are cited during 2002–2007. It is also reflected in the high ACPP values obtained during this period.

*Authorship pattern*

In terms of authorship, papers published in *Current Science* follow the general trend of MA publications as observed in many disciplines[14]. As can be seen from Table 1, up to 1995 SA papers dominated the total output. This is also reflected in the AAPP values which remain close to 1 during this period. Figure 3 shows that after 1995 MA papers start to exceed SA papers, and the overall trend of growth continues for the whole period although the year-by-year pattern shows successive rise and fall. The AAPP also follows the rise and fall pattern. The AAPP values, however, remain between 2 and 4 for most part of the 28-year period. Thus, the authorship trend of *Current Science* is towards MA publications with an average of about three authors per paper.

*Trend of international collaboration*

Figure 4 shows the trend of ICP. Table 2 gives the year-wise number and percentage of papers published by authors only from India, from one or more foreign countries, and ICP (authors from India and a foreign country). It is to be noted that the actual sum of the three categories of publications is less than or equal to the total output in a particular year. This is due to the fact that the affiliation

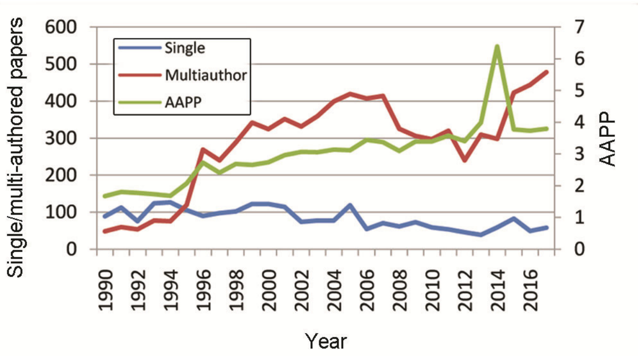


**Figure 3.** Authorship patterns (1990–2017).

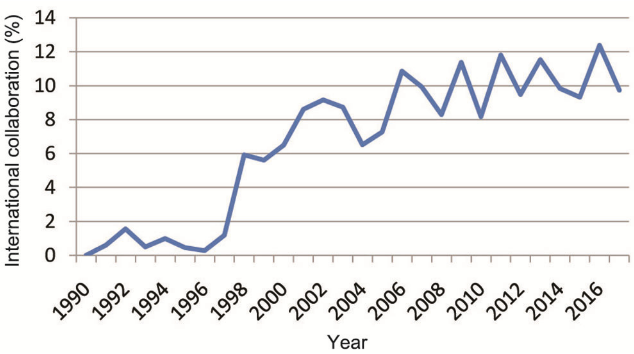


**Figure 4.** International collaboration (%; 1990–2017).

of authors is absent for some of the records. As can be seen from Figure 4, the number of publications generated by international collaboration shows an overall trend of growth during the study period. The number of internationally collaborative publications is however not very high. The highest number of internationally collaborative papers appears in 2016, when the percentage of international collaboration is 12.37.

Among the contributing countries, India has contributed the highest number of publications to the journal output and accounts for more than 89% of the total output during 1990–2017. Table 3 gives the list of top 10 contributing countries in terms of output. Among contributing countries other than India, the United States tops the list accounting for 5.46% of the total output followed by the United Kingdom, Germany and China. The top ten contributing countries other than India together account for 12.96% of the total output.

*Contributing organizations*

Table 4 gives the list of organizations contributing to the journal. As can be seen from the table, Indian Institute of Science, Bengaluru, National Geophysical Research Institute and National Institute of Oceanography are the top three organizations that contribute to the journal output followed by Indian Agricultural Research Institute and Banaras Hindu University. The first central university that appears in the list is Banaras Hindu University, which occupies the 5th position followed by University of Delhi. It is worth noting that no foreign institution appears in the list even in top fifty contributing organizations, indicating the local nature of the journal output. The Chinese Academy of Science, Florida State University, University of Cambridge and University of Oxford are the major foreign organizations contributing to the journal output.

*Highly cited papers*

A total of 103 papers comprise the top 1% cited publications of *Current Science* during 1990–2017. Most of these papers have been published during 2000–2007. Among the highly cited papers, 11 are the result of international collaboration. Most of the highly cited papers originate from India, indicating that Indian institutions have contributed publications with considerably high impact. The paper receiving the highest citation (489) is ‘Regulation of proline biosynthesis, degradation, uptake and transport in higher plants: its implications in plant growth and abiotic stress tolerance’ in 2005 (ref. 15). Interestingly, this paper is written in collaboration with 10 authors from four different institutions, including one from Germany.

**Table 2.** Indian, foreign and international collaborative publications

| Year | Indian | Foreign | ICP | Indian (%) | Foreign (%) | ICP (%) |
|---|---|---|---|---|---|---|
| 1990 | 10 | 5 | 0 | 7.35 | 3.68 | 0 |
| 1991 | 27 | 7 | 1 | 15.79 | 4.09 | 0.58 |
| 1992 | 22 | 8 | 2 | 17.19 | 6.25 | 1.56 |
| 1993 | 33 | 10 | 1 | 16.50 | 5 | 0.50 |
| 1994 | 30 | 8 | 2 | 14.93 | 3.98 | 0.10 |
| 1995 | 59 | 9 | 1 | 26.34 | 4.02 | 0.45 |
| 1996 | 93 | 14 | 1 | 25.98 | 3.91 | 0.28 |
| 1997 | 102 | 19 | 4 | 30.27 | 5.64 | 1.19 |
| 1998 | 320 | 38 | 23 | 82.26 | 9.77 | 5.91 |
| 1999 | 392 | 36 | 26 | 84.48 | 7.76 | 5.60 |
| 2000 | 346 | 63 | 29 | 77.58 | 14.13 | 6.50 |
| 2001 | 376 | 45 | 40 | 80.86 | 9.68 | 8.60 |
| 2002 | 326 | 34 | 37 | 80.69 | 8.42 | 9.16 |
| 2003 | 353 | 33 | 38 | 80.96 | 7.57 | 8.72 |
| 2004 | 408 | 30 | 31 | 85.71 | 6.30 | 6.51 |
| 2005 | 442 | 51 | 39 | 82.31 | 9.50 | 7.26 |
| 2006 | 382 | 24 | 50 | 82.86 | 5.21 | 10.85 |
| 2007 | 388 | 38 | 48 | 80.17 | 7.85 | 9.92 |
| 2008 | 309 | 39 | 32 | 80.05 | 10.10 | 8.29 |
| 2009 | 292 | 42 | 43 | 77.25 | 11.11 | 11.38 |
| 2010 | 294 | 28 | 29 | 82.82 | 7.89 | 8.17 |
| 2011 | 305 | 21 | 44 | 81.77 | 5.63 | 11.80 |
| 2012 | 239 | 16 | 27 | 83.86 | 5.61 | 9.47 |
| 2013 | 283 | 24 | 40 | 81.56 | 6.92 | 11.52 |
| 2014 | 286 | 31 | 35 | 80.34 | 8.71 | 9.83 |
| 2015 | 362 | 94 | 47 | 71.68 | 18.61 | 9.31 |
| 2016 | 370 | 62 | 61 | 75.05 | 12.58 | 12.37 |
| 2017 | 413 | 70 | 52 | 77.20 | 13.08 | 9.72 |

**Table 3.** List of top 10 contributing countries with their output count

| Country | Publication count |
|---|---|
| India | 9250 |
| USA | 564 |
| UK | 172 |
| Germany | 136 |
| China | 127 |
| Japan | 97 |
| France | 70 |
| Australia | 60 |
| Canada | 42 |
| South Korea | 36 |

**Table 4.** List of top 20 contributing organizations

| Organizations* | Count | Percentage contribution |
|---|---|---|
| Indian Institute of Science, Bengaluru | 646 | 6.25 |
| National Geophysical Research Institute | 304 | 2.94 |
| National Institute of Oceanography | 280 | 2.71 |
| Indian Agricultural Research Institute | 215 | 2.08 |
| Banaras Hindu University | 201 | 1.95 |
| University of Delhi | 195 | 1.89 |
| Bhabha Atomic Research Center | 186 | 1.8 |
| Tata Institute of Fundamental Research | 169 | 1.64 |
| Physical Research Laboratory | 165 | 1.6 |
| BirbalSahni Institute of Palaeobotany | 158 | 1.53 |
| Wadia Institute of Himalayan Geology | 154 | 1.49 |
| Space Applications Centre | 149 | 1.44 |
| Jawaharlal Nehru Center for Advanced Scientific Research | 139 | 1.35 |
| National Remote Sensing Centre | 126 | 1.22 |
| Indian Institute of Technology, Kanpur | 121 | 1.17 |
| University of Agricultural Sciences, Bengaluru | 114 | 1.1 |
| Indian Institute of Technology, Kharagpur | 112 | 1.08 |
| Indian Institute of Technology, Bombay | 104 | 1.01 |
| University of Pune | 98 | 0.95 |
| Indian Institute of Technology, Roorkee | 96 | 0.93 |

### *Major research themes*

We have analysed the metadata of publications of *Current Science* in order to identify the major themes of research published in the journal. For the analysis we have used the *bibliometrix* package in R (ref. 16). It uses the 'keywords plus' entry of the metadata to generate the keyword co-occurrences network. This network is then visualized with the network plot function using the Fruchterman–Reingold layout. Walktrap community detection algorithm is used for clustering the nodes[17].

For the analysis of research trends over the years, the data were divided into smaller periods. As the number of papers published during the initial period of the years 1990–2017 is relatively small, the first period for thematic analysis was kept relatively large so as to maintain nearly the same number of records (papers) in each period. The first period was taken from 1990 to 1999. The other periods were divided into three equal parts of 6 years each, viz. 2000–2005, 2006–2011 and 2012–2017. Each graph was generated by limiting the node count to 30. This essentially means that only the top 30 most frequently occurring keywords were included.

Figure 5 shows the keyword co-occurrences plot for the period 1990–99. From the figure, three different clusters can be identified. Two of them are related to biological science and the third cluster is related to physical science. The biological science cluster represented in green has keywords like genes, expression, *Escherichia coli*, proteins, expression, nucleotide and messenger-RNA, etc., indicating research largely related to molecular genetics. On the other hand, the second cluster represented in blue contains general keywords related to biological science. Similarly, the cluster related to physical science comprises of general keywords such as dynamics, model, system, behaviour, water, etc. to which no specific topic can be assigned.

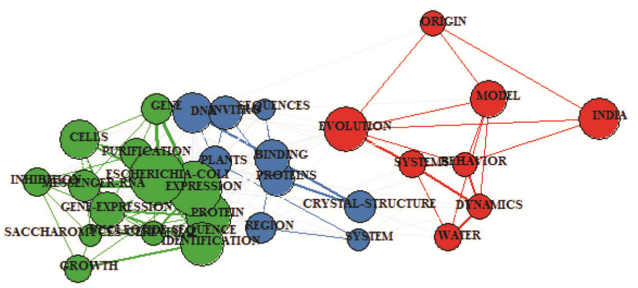


**Figure 5.** Keyword co-occurrences graph (1990–99).

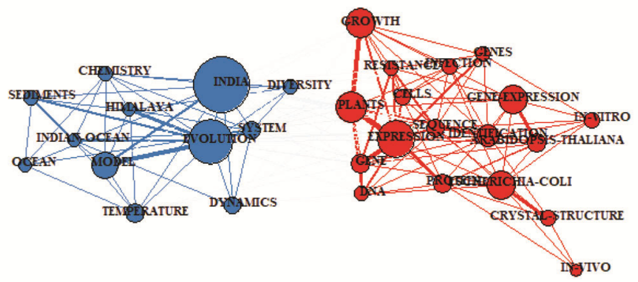


**Figure 6.** Keyword co-occurrences graph (2000–05).

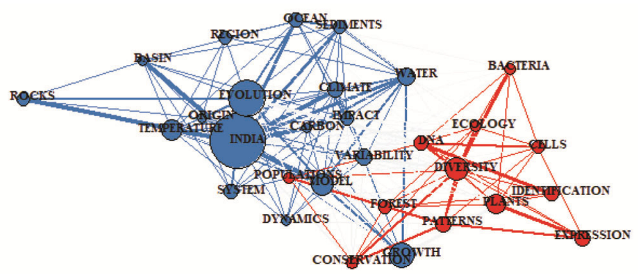


**Figure 7.** Keyword co-occurrences graph (2006–11).

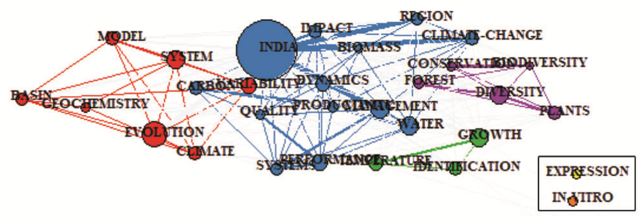


**Figure 8.** Keyword co-occurrences graph (2012–17).

Figures 6 and 7 show the keywords co-occurrences plots for 2000–2005 and 2006–2011 respectively. Unlike Figure 5, Figures 6 and 7 contain two predominant clusters, one representing physical science and the other biological sciences. It indicates more coherent nature of the studies published in *Current Science* during this period. While the keywords related to biological science have hardly changed during this period, the physical science research published in the journal seems more related to geological science. An interesting difference between Figures 6 and 7 is that, while the former is dominated by biological science which is reflected by the larger size of that cluster compared to the cluster related to physical science; the latter is dominated by physical science. It indicates the gradual shift in the theme of research papers published in the journal from biological science to the physical science.

Figure 8 shows keyword co-occurrence plot for the period (2012–2017). The plot consists mainly of four clusters. The two bigger clusters represented in blue and purple in the figure, are related to environmental science where the dominant keywords are climate change, biodiversity, water, forest, plants, region, biomass, etc. The third big cluster represented in red is related to geological science. Interestingly, the cluster related to molecular genetics that once dominated the keyword co-occurrences plots is now the smallest cluster. It clearly indicates the shift in the research topics published in the journal. It may also be concluded that the topics related to environmental science and geological science have gathered more focus of the researchers during recent periods. Further, the clusters related to environmental science and geology closely interact with each other, indicating interdisciplinary research in this area. Thus, a general trend of shift in research trend from traditional areas to interdisciplinary areas can be seen. Another interesting observation is the continuous occurrence of 'India' as a prominent topic in each period. This indicates that despite being an international journal, the contents published in *Current Science* are predominantly focused on India.

## Conclusion

This article presented a scientometric analysis of *Current Science.* It was established by distinguished scientists with the aim of providing an Indian platform to Indian scientists to publish their research, and also make the general Indian audience aware of recent developments in science, both in India and abroad. The journal has completed more than 85 years and is still among the most reputed science journals in India. We found that about 55% of the published items were articles and reviews, likely to be core science or science-related papers, while the remaining 45% were Commentary, News, etc. This suggests that *Current Science* was intended to be a 'news and views' journal, originally modelled on *Nature* and *Science*. For complete characterization of the journal, the analysis of the remaining 45% of the published items need to be done in a future study.

Growth of the published items was clearly observable from the journal output over the years. Starting with a modest close to 100 publications in the beginning of the study period, the journal now publishes around 300–500 research papers in a year. The number of persons who collaborate on a paper has increased from 1 to over 3. Further, a fair percentage of the papers published in the journal are cited. The publications mostly arise from India, which indicates that the journal remains India-focused. At the same time, some of the subject matter could certainly be global. Further, the fact that the top institutions publishing in the journal are primarily research organizations and not institutions of higher education, might need more evaluation. The contents published in the journal during initial years of the study period focused more on biological sciences, specifically on topics related to molecular genetics. The theme of publications however, has gradually shifted towards physical sciences. Majority of the contents now published in the journal is related to environmental science and geological sciences.

The importance of *Current Science* lies in the fact that a journal cutting across disciplinary boundaries is necessary so that the views and concerns of a group of scientists, primarily from India, become known to all. Of course, this cross disciplinary dialogue can only take place with an active part played in writing and responding to items of discussion. The editors and publishers have done great service by keeping subscription rates low and within the reach of the average scientist. Access to the on-line edition is free.

It would have been interesting to see how the journal's growth is related to different epochs of the journal under the helmsmanship of different editors, who have been illustrious scientists in their own right, but we must leave that to a subsequent paper.


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Received 19 January 2019; revised accepted 18 March 2019

doi: 10.18520/cs/v117/i2/190-197