Scientometric Analysis of Indian Citation Index (2004-2015): Profile of the Domain of Energy and Fuel Science Journals

G Ulaganathan[*]*, R Senthilkumar*[**]

Abstract

Indian Citation Index database is a powerful tool to search, track, and measure and collaborate in the sciences, social sciences, arts, and humanities. This article discusses the published research articles, citations and self-citations in the Energy and Fuel Science Journals which are available in Indian Citation Index. There are 793 articles published from 5 Energy and Fuel Science Journals. Among them, Journal of Mines, Metals and Fuels occupies first position with 442 (55.74%) articles and Journal of Energy Heat and Mass Transfer occupies second rank with 140 (17.66%) articles and Journal of Biofuels is in third 79 (9.96%). It is pointed out that the frequency of the journals is varying and that is one of the reasons for the strength of articles. Further, in the year 2010, 98 (12.36%) articles are published and it is highest when comparing to other years.

Keywords: Energy and fuel science, Indian citation index, Citations, Self-citations, JCI, RII.

Introduction

The true barometer of assessing the quality and quantity of a journal is the Citation Index. While discussing citation, one needs to understand what a citation is? Simply, when another refers other works in his/her article, we call the article referred is cited. In other words the citation is called as the previous work which is referred in the present work. The quality of a given work can rightly be adjudged through the number of citations that it gets. Therefore, a certain piece of article or research paper carrying more number of citations get more impact than the work carrying less citations. Therefore, we always refer to some indexing and abstracting databases like Scopus, Web of Science, or even Google Scholars to know the impact of a journal, a particular article or a particular author. Indian Citation Index which was initiated by Diva enterprises is just an indexing and abstracting database. This study attempts to analyze authors in the field of Energy and Fuel Science during 2004-2015. Further it is to find out the journals which more cited and self-cited.

[*]LIS, Research Scholar Ph.D. (PT), Kongunadu Arts and Science College (Autonomous), Coimbatore-641029, India and Librarian, Dr. SNS. Rajalakshmi College of Arts and Science, (Autonomous), Coimbatore-641049, India.

[**]Librarian (SG) and Head (Research), Department of Library and Information Science, Kongunadu Arts and Science College (Autonomous), Coimbatore-641029, India.

Correspondence to: Mr. G. Ulaganathan, Kongunadu Arts and Science College (Autonomous), Coimbatore-641029, India and Librarian, Dr. SNS. Rajalakshmi College of Arts and Science, (Autonomous), Coimbatore-641049, India.

E-mail Id: ulaganathanlib@gmail.com

Review of Literature

David N, Maureen R [1] views that, "bibliometric studies provide information about the structure of knowledge and how it is communicated?" Moreover, bibliometric studies are normally employed to evaluate the academic research output, the quality of the journal, impact and influence of articles, authors, and assorted parameters. Though there has been substantial growth of literature on bibliometric studies during the last decade, the authors focus on some of the pertinent literature that relate to the present study. Potter WG defines bibliometric study as "the study and measurement of the publication patterns of all forms of written communication and their authorship" [2]. In a most interesting study Mooghali A et al. analyzed records of three premiere indexes namely, "Social Science Citation Index", "Science Citation Index", and "Arts and Humanities Citation Index", and projected how the field of "scientometrics" evolved between 1980 to 2009 [3]. The pattern of growth of literature in the field of Nano science during 1990 to 2009 was reported by Karpagam et al. [4]. In the similar vein, Giovanni A exercised bibliometric techniques on some national level research assessment [5]. Lapon-Kandelshein E et al. bibliographical research on Hebrew printing also needs mention [6]. In the similar light bibliometric studies by veterans like Krampen G et al. [7] and Kumar S et al. [8] and others also presented findings on different directions. Dhanavandan S, Tamizhchelvan M studied research productivity and citations of universities in south Tamil Nadu from 2009 to 2013 based on Indian Citation Index [9]. In extension to Dhanavandan and Tamizhchelvan's study, the present study covers in its scope a different time slot of publication ranging from 2009 to 2015.The main aim of the study is to analysis the citations and self-citations of Energy and Fuel Science Journals from Indian Citation Index articles for the period of 2004 to 2015.

Objectives of the Study

Based on the sources framed the following objectives:

- To assess the strength of articles Energy and Fuel Science Journals.
- To analyses the year wise Citations and Self-citations.
- To find out the Journals JCI.
- To assess the Journals RII.
- To identify the Journals uncited %.

Methodology

The Citation analysis is one of the most widely used tools for measuring expertise in the field of study by way of calculating the impact factor, number of citations, etc. It is a control as well as measuring tools for country wise or subject wise. This study is aimed to discuss the analysis of the citation index in the field of Energy and Fuel Science Journals.

Analysis and Interpretation

The authors have been selected data from relevant sources from Indian Citation Index and the following discussions made for the period of 2004 to 2015. Remaining year's publications (Before 2004) will not be considered for this study. In this study denotes

- EFJ: Energy and Fuel users Journal
- JB: Journal of Biofuels
- JEHMT: Journal of Energy Heat and Mass Transfer
- JMMF: Journal of Mines, Metals and Fuels
- JRED: Journal of Resources, Energy and Development

Distribution of Energy and Fuel Science Journals in ICI from 2004-2015 Vs Articles

Table 1.Distribution of Energy and Fuel Science Journals in ICI from 2004-2015 Vs Articles

S. No.	Year	EFJ	JB	JEHMT	JMMF	JRED	Total	%
1	2004	10	--	7	44	6	67	8.45
2	2005	19	--	20	30	7	76	9.59
3	2006	9	--	5	70	10	94	11.85
4	2007	5	--	20	36	8	69	8.70
5	2008	3	--	25	31	7	66	8.32
6	2009	7	--	22	54	6	89	11.22
7	2010	2	30	22	37	7	98	12.36
8	2011	3	9	19	40	12	83	10.47
9	2012	1	12	--	41	6	60	7.57
10	2013	--	10	--	21	4	35	4.41
11	2014	--	10	--	21	--	31	3.91
12	2015	--	8	--	17	--	25	3.15
	Total	59	79	140	442	73	793	100
	%	7.44	9.96	17.66	55.74	9.20	100	

Table 1 indicates number of articles published in Energy and Fuel Science Journals in Indian Citation Index. As per the Indian Citation Index 5 journals are taken for this study for the period of 2004 to 2015. There are 793 articles published from 5 Energy and Fuel Science Journals. Among the 5, Journal of Mines, Metals and Fuels occupies first position with 442 (55.74%) articles and Journal of Energy Heat and Mass Transfer occupies second rank with 140 (17.66%) articles Journal of Biofuels is in third 79 (9.96%). It is pointed out that the frequency of the Journals is varying and that is one of the reasons for the strength of articles. Further, in the year 2010, 98 (12.36%) articles are published and it is highest when comparing to other years.

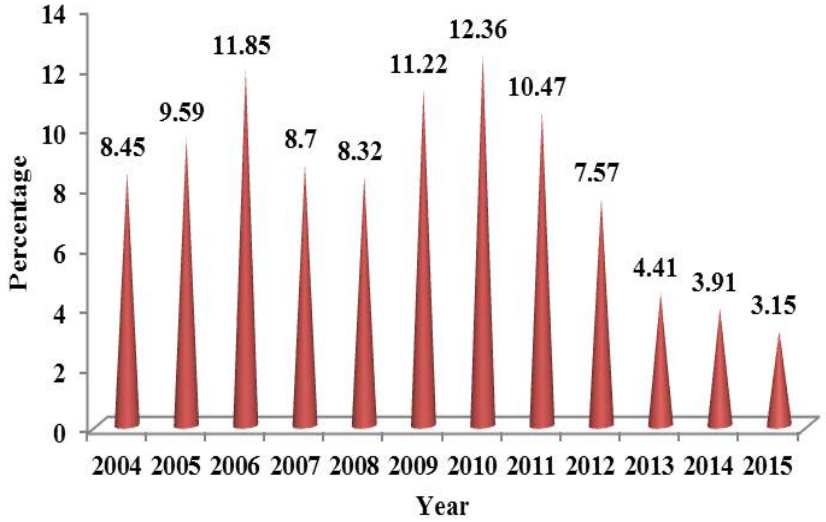

Figure 1.Distribution of Energy and Fuel Science Journals in ICI from 2004-2015 Vs Articles

 ISSN: 2455-3093

Distribution of Energy and Fuel Science Journals based on Citations from 2004-2015

Table 2.Distribution of Energy and Fuel Science Journals based on Citations from 2004-2015

S. No.	Year	EFJ	JB	JEHMT	JMMF	JRED	Total	%
1	2004	1	--	0	11	1	13	10.16
2	2005	0	--	5	6	2	13	10.16
3	2006	0	--	1	9	3	13	10.16
4	2007	0	--	7	9	1	17	13.28
5	2008	0	--	8	23	1	32	25.00
6	2009	0	--	5	11	0	16	12.50
7	2010	0	3	3	3	0	9	7.03
8	2011	0	0	3	3	0	6	4.69
9	2012	0	2	--	2	0	4	3.12
10	2013	--	3	--	1	0	4	3.12
11	2014	--	1	--	0	0	1	0.78
12	2015	--	0	--	0	0	0	0
	Total	1	9	32	78	8	128	100
	%	0.78	7.03	25.00	60.94	6.25	100	

Table 2 shows the citations of the Energy and Fuel Science Journals in Indian Citation Index for the years from 2004 to 2015. Among the 5 Journals, 128 citations were available. Out of 128, Journal of Mines, Metals and Fuels Journal occupy the first position with 78 (60.94%) citations and Journal of Energy Heat and Mass Transfer 32 (25%) is in the second position.

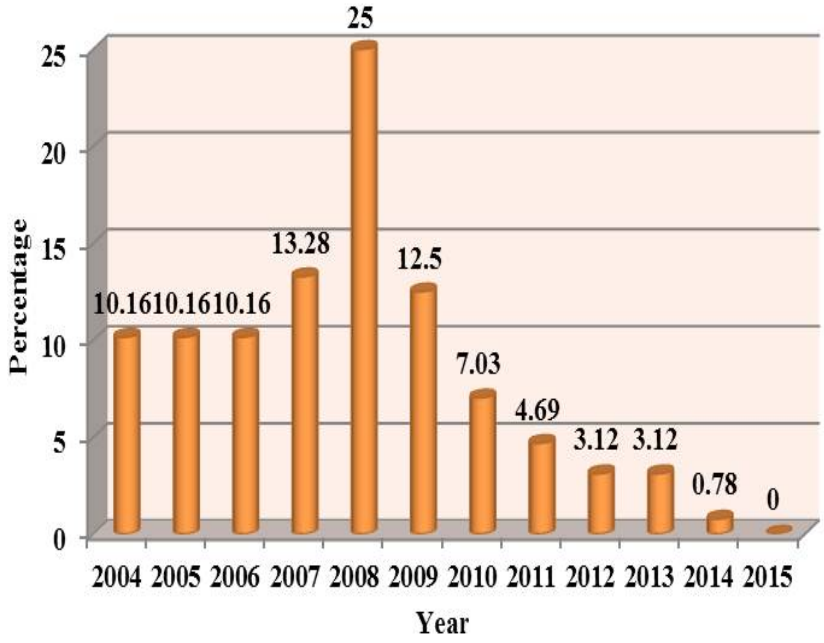

Figure 2.Distribution of Energy and Fuel Science Journals based on Citations from 2004-2015

Distribution of Energy and Fuel Science Journals Based on Self Citations from 2004-2015

Table 3.Distribution of Energy and Fuel Science Journals Based on Self Citations from 2004-2015

S. No.	Year	EFJ	JB	JEHMT	JMMF	JRED	Total	%
1	2004	0	--	0	8	0	8	10.52
2	2005	0	--	2	6	0	8	10.52
3	2006	0	--	1	7	0	8	10.52
4	2007	0	--	2	8	0	10	13.16
5	2008	0	--	2	21	1	24	31.58
6	2009	0	--	2	4	0	6	7.90
7	2010	0	2	3	2	0	7	9.21
8	2011	0	0	0	1	0	1	1.32
9	2012	0	1	0	1	0	2	2.63
10	2013	0	0	0	1	0	1	1.32
11	2014	0	1	0	0	0	1	1.32
12	2015	0	0	0	0	0	0	0
	Total	0	4	12	59	1	76	100
	%	0	5.26	15.79	77.63	1.32	100	

Table 3 represents the self-citations of the Energy and Fuel Science Journals which are available in Indian Citation Index from the year 2004 to 2015. Among the 5 Energy and Fuel Science Journals 76 Self citations were identified for the period of 2004 to 2015. Out of 76, Journal of Mines, Metals and Fuels Journal occupy the first position with 59 (77.63%) self-citations and Journal of Energy Heat and Mass Transfer is in the second position 12 (15.79%) self-citations. Further Journal of Biofuels is in third position 4 (5.26%) self-citations.

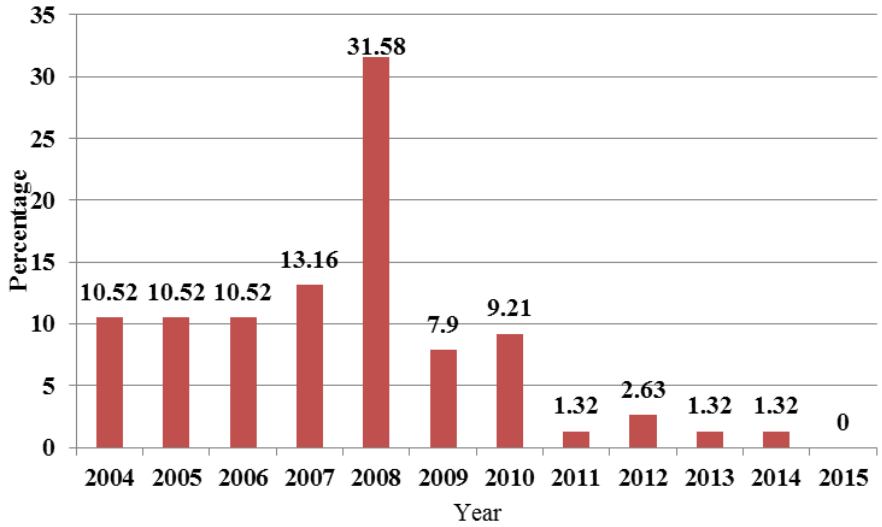

Figure 3.Distribution of Energy and Fuel Science Journals Based on Self Citations from 2004-2015

 ISSN: 2455-3093

Distribution of Energy and Fuel Science Journals JCI

Table 4.Distribution of Energy and Fuel Science Journals JCI

S. No.	Year	EFJ	JB	JEHMT	JMMF	JRED	Total	%
1	2004	0	--	0	0	0	0	0
2	2005	0	--	0	0	0	0	0
3	2006	0	--	0	0	0	0	0
4	2007	0	--	0	0	0	0	0
5	2008	0	--	0	0.032	0	0.032	25.40
6	2009	0	--	0	0.019	0	0.019	15.08
7	2010	0	0	0	0.027	0	0.027	21.42
8	2011	0	0	0	0	0	0	0
9	2012	0	0	0	0	0	0	0
10	2013	0	0	0	0.048	0	0.048	38.10
11	2014	0	0	0	0	0	0	0
12	2015	0	0	0	0	0	0	0
	Total	0	0	0	0.126	0	0.126	100
	%	0	0	0	100	0	100	

Table 4 indicates Journals Citations index of the Energy and Fuel Science Journals which are indexed in Indian Citation Index for the period of 2004 to 2015. Among the 5 Journals the JCI % value is for Journal of Mines, Metals and Fuels only.

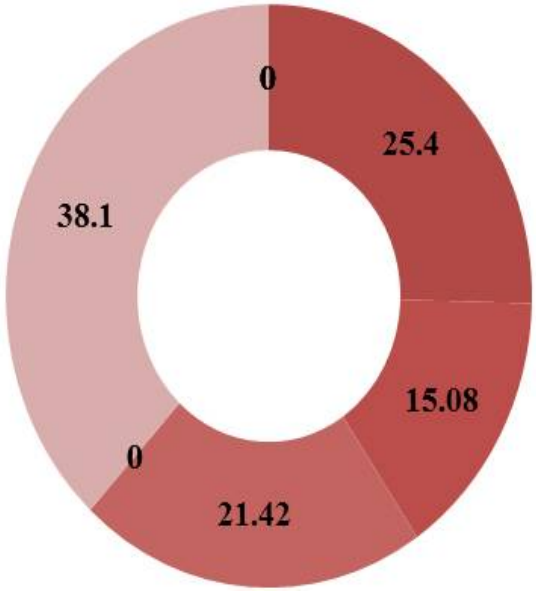

Figure 4.Distribution of Energy and Fuel Science Journals JCI

Distribution of Energy and Fuel Science Journals Research Impact Indicator (RII)

Table 5.Distribution of Energy and Fuel Science Journals Research Impact Indicator (RII)

S. No.	Year	EFJ	JB	JEHMT	JMMF	JRED	Total	%
1	2004	--	--	--	--	--	--	--
2	2005	--	--	--	--	--	--	--
3	2006	--	--	0.037	0.014	--	0.051	4.30
4	2007	--	--	0.040	0.020	0.118	0.178	15.02
5	2008	--	--	0.160	0.019	--	0.179	15.11
6	2009	--	--	--	0.104	--	0.104	8.78
7	2010	--	--	0.128	0.118	--	0.246	20.76
8	2011	--	--	0.091	0.044	--	0.135	11.39
9	2012	--	0.026	--	0.039	--	0.065	5.49
10	2013	--	0.095	--	0.025	--	0.120	10.13
11	2014	--	0.091	--	0.016	--	0.107	9.02
12	2015	--	--	--	--	--	--	--
	Total	--	0.212	0.456	0.399	0.118	1.185	100
	%	--	17.89	38.48	33.67	9.96	100	

Table 5 shows the RII of the Energy and Fuel Science Journals which are indexed in Indian Citation Index. Among the 5 Journals, Journal of Energy Heat and Mass Transfer has 0.456 (38.48%) RII and it is the highest when comparing to other Energy and Fuel Science Journals in ICI.

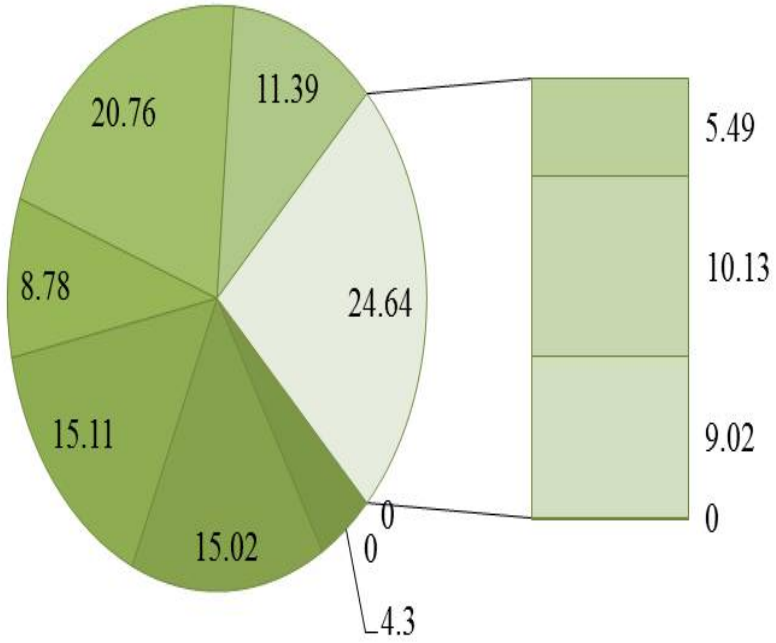

Figure 5.Distribution of Energy and Fuel Science Journals Research Impact Indicator (RII)

 ISSN: 2455-3093

Journals Uncited %

Table 6.Journals Uncited %

S. No.	Journal Title	Uncited %
1	Energy and Fuel users Journal	98.31
2	Journal of BIOFUELS	91.14
3	Journal of Energy Heat and Mass Transfer	87.14
4	Journal of Mines, Metals and Fuels	88.01
5	Journal of Resources, Energy and Development	90.10

Table 6 shows the uncited % of the Energy and Fuel Science Journals during the period of study. Energy and Fuel users' journal's uncited% is 98.31% followed by Journal of Biofuels with 91.14%.

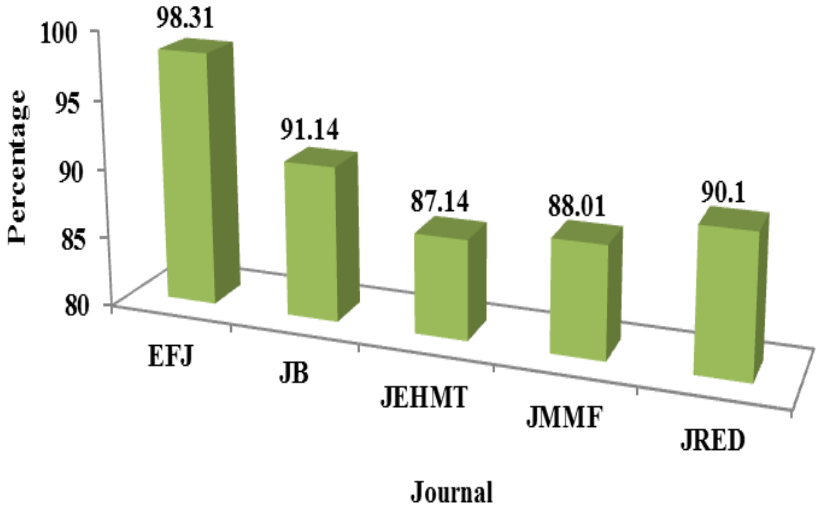

Figure 6.Journals Uncited %

Conclusion

The quality of research and quantity of research is made available through indexing journals with citations of various articles. There is lacking, for providing citations to other articles which authors cite. For reviewing the previous articles are very much important for supporting your article value added point for publishing. From this study, it shows that very few Journals are citing and cited properly and indexed with ICI. It is a good practice to give self-citation for their previous works and it is follow up of the previous one and improved one. During the period of study, there are 793 articles published from 5 Energy and Fuel Science Journals. Among the 5, Journal of Mines, Metals and Fuels occupies first position with 442 (55.74%) articles and Journal of Energy Heat and Mass Transfer occupies second rank with 140 (17.66%) articles Journal of Biofuels is in third 79 (9.96%). It is pointed out that the frequency of the Journals is varying and that is one of the reasons for the strength of articles. The present study shows that 128 citations were available, Journal of Mines, Metals and Fuels journal occupy the first position with 78 (60.94%) citations and Journal of Energy Heat and Mass Transfer 32 (25%) is in the second position. Among the 5 Energy and Fuel Science Journals 76 Self citations were identified for the period of 2004

to 2015. The Journal of Mines, Metals and Fuels Journal occupy the first position with 59 (77.63%) self-citations and Journal of Energy Heat and Mass Transfer is in the second position 12 (15.79%) self-citations. Further Journal of Biofuels is in third position 4 (5.26%) self-citations. Among the 5 Journals the JCI % value is for Journal of Mines, Metals and Fuels only. The study reveals that the Journal of Energy Heat and Mass Transfer has 0.456 (38.48%) RII and it is the highest when comparing to other Energy and Fuel Science Journals in ICI. It is concluded that the Energy and Fuel users' Journal's uncited% is 98.31% followed by Journal of Biofuels with 91.14%.

References

[1] David N, Maureen R. Literature and Bibliometrics. London: *Clive Bingley, Linnet Books*, 1978.

[2] Potter WG. Introduction to bibliometric. *Library Trends* 1981; 30: 3-7.

[3] Mooghali A, Alijani R, Karami N et al. Scientometric Analysis of the Scientometric Literature. *International Journal of Information Science and Management* 2011; 9(1): 19-31.

[4] Karpagam R, Gopalakrishnan S, Natarajan M et al. Mapping of nanoscience and nanotechnology research in India: a scientometric analysis, 1990-2009. *Scientometrics* 2011; 89: 501.

[5] Giovanni A. National research assessment exercises: a comparison of peer review and bibliometrics rankings. *Scientometrics* 2011; 89(3): 929-41.

[6] Lapon-Kandelshein E, Prebor G. Bibliographical research in the study of Hebrew printing: a bibliometric analysis. *Scientometrics* 2011; 88(3): 899-913.

[7] Krampen G, Eye A, Schui G. Forecasting trends of development of psychology from a bibliometric perspective. *Scientometrics* 2011; 87(3): 687-94.

[8] Kumar S, Tiwari C, Mahija D. Contribution to Indian sociology: A Bibliometric study. *Language in India* 2012; 5.

[9] Dhanavandan S, Tamizhchelvan M. Citations and Self citations of Indian Authors in Library and Information Science: A Study Based Indian Citation Index (ICI). *International Journal of Academic Library and Information Science* 2014; 2(9): 138-44.