

A BIBLOMETRIC STUDY OF ARTICLES PUBLISHED AND PAPERS PRESENTED BY SCIENTISTS OF CENTRAL BUILDING RESEARCH INSTITUTE 1980-90

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The paper presents a bibliometric study of the research papers contributed by the scientists of CBRI, Roorkee in the form of articles published in Indian and foreign periodicals and papers presented in national and international conferences. These research papers are the outcome of various R and D projects carried out by scientists of CBRI during 1980-90. It is evident that there is a downward trend of the published research output. Suggestions and a list of journals in the field, with their rankings, impact factors and immediacy index have been given to enable the scientists to publish their work in these journals to improve the impact of their published work.

Prelude

The Central Building Research Institute is one of engineering laboratories of the Council of Scientific and Industrial Research (C.S.I.R.). Its scientists have been generally publishing in journals (Both Indian and Foreign) and presenting papers in the national and international conferences. Some of the selected journals and conferences to which CBRI scientists are contributing papers and articles are listed in tables 1 and 5. It can be stated with a certain degree of confidence that the contribution of the scientists of CBRI to the advancement of knowledge in diverse fields has been significant.

To what extent has this activity guided the implementation of the programmes of CBRI and what has been the impact of these contributions, are the questions that need be approached with care after a well planned analysis of the literature output by them. Also in the methodology evolved, for the purpose of evaluation of the performance of CBRI this activity could well be a criterion to be reckoned with. In any case, a 10 years analysis of the papers published by CBRI was due. This prompted us

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to undertake a systematic bibliometric analysis of the papers published by the scientists of CBRI during 1980-90. It was realised that publication of papers only cannot be the criterion for the evaluation or for decision making, even if they are considered important. Although, it may be that this kind of analysis can not hold good in all cases, yet in the absence of a viable alternative to classify and evaluate research papers, this analysis is considered worthwhile. Bibliometric analysis is but one component of the measure of output of research. It has to be interpreted along with other measures. Even so, in the absence of any other accepted criterion, it is relevant in so far as the publication of papers are concerned and important activity of a R & D laboratory.

Methodology

Total 822 research papers were published by the scientists of C.B.R.I. during January 1980 to March 1990. These publications were analysed to obtain the research output of CBRI. Each paper was categorised on the basis of the journal in which it appeared and to the division to which it belonged. It has been observed that the journals in the area of basic science such as Physics, Chemistry, Biology, Microbiology, Drugs etc. have all been covered by the Science Citation Index (SCI) and are regularly analyzed by the Journal citation Report (JCR). It is unfortunate that the engineering journals have not attracted much attention of SCI and therefore their impact factor, immediacy index, self-citation rate etc. are not known.

Definitions

1 Impact Factor

It is the ratio between the number of times a journal is cited and the number of citable articles published by the journal in a given span of time.

2 Immediacy Index

How often (on an average) each article is cited during the year of its publication.

3 Self citation Rate

What percent of citations received by a journal originated by a journal in articles published by the journal.

Approach followed in estimation of Impact factors for the journals of interest to CBRI

The reputed journals in Civil Engineering, which are covered by science citation Index provide all basis for assigning impact factors to the other journals in the same discipline. In every discipline of interest to CBRI subject experts were approached to make their judgement in assigning impact factors and guiding average was taken in arriving at the recommended values. For instance, the Journal of Geotechnical Engineering (*American Society of Civil Engineers, New York*) has been assigned impact factor 0.471 by SCI (1988). Keeping this value in view, the impact factors for other journals like Indian Geotechnical Journal was arrived at in keeping with the consideration of the relative merits. The total impact factors of 339 papers published by the CBRI scientists during 1980-90 in Indian and foreign journals calculated in the manner specified above, worked out to be 36.371. It, therefore, follows that average impact per article lie close to 0.113 (Table 4).

The above analysis clearly indicates that the impact factors, if worked out by taking the impact factor of a few outstanding civil engineering journals as assigned by the SCI as the basis, would grossly under estimate the merit of papers in most other engineering journals. This is because the IF of papers published in the best of engineering journals falls way behind the IF of front line disciplines viz. Physics, Chemistry and Biology. Quite clearly, IF depends also on the status of a given discipline in the world of science and scales tilt in favour of journals in such disciplines which are popularly covered by SCI. The professionals in the civil Engineering Laboratories have come to the conclusion that the journal published by the American Society of Civil Engineers, would be amongst the best in the world and for this publication, an impact factor value assigned by SCI is just 0.471 only compared with the best journal say Biological Chemistry

where the assigned value of impact factor is to the tune of 6.000 or more.

The evaluation of the performance of the scientists in engineering laboratories, therefore, cannot be appropriately done by the kind of approach followed in the above analysis. In fact, Eugene Garfield, one of the authorities to the theory and application of citation analyst, has time and again drawn attention to the differences in the citation characteristics that exist between the literature of different fields of science. More recently, Corneliers le Pair has argued in favour of not applying citation analysis to technology like applied sciences, engineering, instrumentation, etc., where patenting and product design and manufacture are more important than paper writing and citing.

Analysis of Research Output

The table 1 details out the contribution of CBRI scientists in Indian and foreign journals during 1980-90. Three hundred and thirty nine (339) articles were published in 94 journals. Seventy nine (79) articles were published in the year 1980. There is a downward and upward trend during 1981 to 1990. The bar chart 1 drawn for the purpose shows the trend. From the table 1, it was observed that there has been a declining trend during 1989 to 1990 indicating that there has been a decline in the research activities of the Institute.

The close examination of Table 1 shows that CBRI scientists preferred some Indian journals to publish their paper during 1980-90.

Indian Concrete Journal	44 papers
Indian Ceramics	22 papers
Research and Industry	19 papers
Journal of Instt.of Civil Engineers	12 papers
Indian Construction	11 papers
Indian Geotechnical Journal	11 papers
Indian Architects	11 papers
Paint India	8 papers

TABLE I

CONTRIBUTION OF CBRI'S SCIENTISTS IN INDIAN AND FOREIGN JOURNALS DURING 1980-90

S.no.	Title(s) of Journal(s)	Country	I.F.	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	Total
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	Acı-Structural Engineering	U.S.A.	0.001	-	-	-	-	-	-	-	-	1	-	-	1
2	Architects trade journal	India	0.001	1	-	1	-	-	-	-	-	-	-	-	2
3	Architectural science review	Australia	0.222	-	-	-	-	-	-	-	1	1	-	-	2
4	Bricks & tile news	India	0.010	1	2	3	-	-	-	-	-	-	-	-	6
5	Builders friends	India	0.001	1	1	-	-	-	-	-	-	-	-	-	2
6	Building and environment	U.K.	0.100	2	1	-	-	-	1	-	-	-	-	-	4
7	Building and prefabrication	U.K.	0.010	1	-	-	-	-	-	-	-	-	-	-	1
8	Building research & practice	U.K.	0.035	-	-	-	-	1	2	-	-	1	2	2	8
9	Cement	India	0.020	2	2	-	-	-	-	-	-	-	-	-	4
10	Cement & concrete research	U.K.	0.200	-	-	-	1	-	-	-	-	-	-	-	1
11	Cement Industry	U.K.	0.010	-	-	-	-	-	2	-	-	-	-	-	2
12	Cera murgia	Italy	0.010	-	-	-	-	-	-	1	-	-	-	-	1
13	Changing Indian villages	India	0.001	-	-	-	1	-	-	-	-	-	-	-	1
14	Chemical Age of India	India	0.010	1	1	-	-	-	1	-	-	-	-	-	3
15	Chemical Era	India	0.001	2	-	1	-	-	-	-	-	-	-	-	3
16	Civil Engg. Construction Rev.	India	0.001	-	-	-	-	-	-	-	-	-	1	-	1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
17	Construction Building technology	0.060	-	-	-	-	-	-	-	-	-	-	-	1
18	Corrosion Bulletin	0.020	-	-	-	1	-	-	-	-	-	-	-	1
19	Design Incorporating Indian builder	0.010	1	1	-	-	-	1	-	-	-	-	-	3
20	Durability of building Materials	0.201	-	-	-	2	-	1	-	-	-	-	-	3
21	Electrochemical society of India	0.080	-	-	-	-	-	-	-	-	-	-	-	1
22	Electrochemistry	0.080	-	-	-	-	-	-	-	-	1	1	-	1
23	Engn.construction review	0.010	-	-	-	-	-	-	-	-	-	-	-	1
24	Energy management	0.010	-	2	-	-	-	-	-	-	-	-	-	1
25	Euroclay	0.010	1	-	-	-	-	-	-	-	-	-	-	2
26	Fire Engineer	0.200	1	2	3	2	1	1	-	-	-	-	-	1
27	Fire Safety journal	0.200	-	-	-	-	-	-	-	-	-	-	-	10
28	Fire technology	0.201	-	-	-	-	-	-	-	-	-	-	-	1
29	Indian Architecture	0.001	-	-	-	-	-	-	1	1	-	-	-	2
30	Indian Architect and builder	0.001	4	3	2	2	-	-	-	-	-	-	-	11
31	Indian ceramics	0.001	-	-	-	-	-	-	-	-	-	1	2	3
32	Indian concrete journal	0.050	7	5	1	3	-	1	1	1	2	1	-	22
33	Indian construction	0.050	9	6	3	4	2	3	2	7	7	-	1	44
34	Indian geotechnical journal	0.001	2	1	2	2	2	-	-	1	1	-	-	11
35	Indian journal of Environ.& health	0.060	4	3	-	-	1	1	-	-	-	1	1	11
36	Indian jour of pure and appl.physics	0.189	-	-	-	-	-	1	-	-	-	-	-	2
37	Indian jour of power & river vall.dev.	0.124	2	-	-	-	-	-	-	-	-	-	-	2
38	Indian jour. of technology	0.004	-	-	-	-	-	1	-	-	-	-	-	1
		0.130	-	-	1	1	-	-	-	-	-	-	-	2

<i>I</i>	2	3	4	5	6	7	8	9	10	11	12	13	14	15
39	India	0.001	-	-	-	-	-	-	1	-	-	-	-	1
40	Jour of Inst.of Engrs (India)-chem.	0.020	-	-	-	-	-	3	-	-	-	-	-	3
41	Jour. of Inst of Engrs (India)-civil		2	4	-	-	1	1	-	1	2	-	1	12
42	Jour of Engrs(India)-Env.	0.010	-	-	-	-	-	-	-	1	2	-	1	1
43	Jour.of Inst.of Engrs (India) Hindi	0.010	9	-	-	-	-	-	-	-	-	-	-	9
44	Jour.of National building organization	0.010	3	-	1	-	-	-	-	2	-	-	-	6
45	Jour.of oil & chemical assoc.	0.250	1	-	-	-	-	-	-	-	-	-	-	1
46	Jour. of optics	1.411	-	-	2	-	-	-	-	-	-	-	-	2
47	Jour. of school plan Arch.	0.001	-	-	-	-	-	1	-	-	-	-	-	1
48	Jour. of sc. & Ind. research	0.248	-	-	-	-	-	1	-	-	-	-	-	1
49	Jour. of structural Engg. ASCE	0.515	-	-	-	-	-	-	-	1	-	-	-	1
50	Khadi gram udyog	0.001	1	2	1	1	-	-	1	-	-	-	-	6
51	Meri journal	0.001	-	-	-	-	-	1	-	-	-	-	-	1
52	Metal and mineral Rev.	0.010	-	-	-	2	-	1	-	-	-	-	-	3
53	Paint India	0.300	-	1	-	1	3	-	-	1	1	-	1	8
54	Periodica polytechnica	0.010	-	-	-	-	-	1	-	-	-	-	-	1
55	Plastic Rubb, & mat Appl.	0.004	1	-	-	-	-	1	-	-	-	-	-	1
56	Polytechnica	0.010	-	-	-	-	-	1	-	-	-	-	-	1
57	Popular plates and rubber	0.001	1	1	-	-	-	1	-	-	-	-	-	2
58	Pragati Nirman	0.001	-	-	-	-	-	2	-	-	-	-	-	2
59	Pragya	0.001	-	-	1	-	-	-	-	-	-	-	-	1
60	Proceedings of Asce	0.100	-	-	-	-	-	-	-	-	-	1	-	1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
61	Process and plant Engg.	India	0.001	-	-	-	-	-	-	-	-	-	-	1
62	Research and industry	India	0.726	6	2	5	2	1	2	1	-	-	-	19
63	Salt research industry	India	0.001	-	-	1	-	-	-	-	-	-	-	3
64	Science Reporter	India	0.001	1	-	-	1	-	-	-	-	-	-	2
65	Science today	India	0.001	1	-	-	-	-	-	-	-	-	-	1
66	Soil mechanics and found Engg.	Japan	0.019	1	-	-	-	-	-	-	-	-	-	1
67	Tata energy research	India	0.019	1	1	-	-	-	-	-	-	-	-	2
68	Trans of Indian cermics	India	0.050	-	-	1	-	1	1	-	-	-	-	3
69	Trans of Indian Soc. of Des. Tech.	India	0.050	1	-	-	-	-	-	-	-	-	-	1
70	Tunneling and Und.ground Space Tech.	U.S.A.	0.200	-	-	-	-	-	-	-	-	-	1	1
71	Urja	India	0.001	1	-	-	-	-	-	-	-	-	-	1
72	Vigyan pragati	India	0.001	-	3	-	-	-	-	-	1	-	-	4
73	Voluntary Action	India	0.001	1	-	-	-	-	-	-	-	-	-	1
74	Yojna	India	0.001	3	-	-	-	-	-	-	-	-	-	3
75	Zement kalk Gips	Germany	0.762	1	1	-	-	-	-	-	1	-	-	3

Similarly, some selected foreign periodicals chosen by CBRI scientists to publish their best papers.

Fire Engineer	10 papers
Building Research and Practice	8 papers
Cement and concrete	4 papers
Durability of Building Materials	3 papers

But by and large it was found that 97 papers were published in substandard journals. It is suggested that CBRI Building Material chemists must publish some of their articles in Indian Journal of Chemistry Section A and B published by CSIR, Delhi.

TABLE 2

YEARWISE DISTRIBUTION OF PAPERS IN INDIAN AND FOREIGN JOURNALS

S.NO	YEAR(S)	INDIAN JOURNALS	FOREIGN JOURNALS	TOTAL
1	1980	69	10	79
2	1981	46	5	51
3	1982	38	5	43
4	1983	26	6	32
5	1984	21	4	25
6	1985	22	6	28
7	1986	9	3	12
8	1987	14	3	17
9	1988	16	7	23
10	1989	8	7	15
11	1990	9	5	14
Total		278	61	339

Table 2 gives yearwise distribution of papers published

in Indian and foreign journals. The table shows that scientists preferred to publish in Indian journals which is clear that 253 papers published in Indian journals. This shows that Indian journals easily accept the articles for publication and much of refereeing is not done in comparison to foreign periodicals.

It was heartening to note that the CBRI technology could be published in 61 foreign journals indicating that the foreign periodicals are strict to publish the Indian papers. Only top class papers are accepted by them.

Table 3 gives the details of the division wise distribution of papers in Indian and foreign journals. The whole research activity of the CBRI is carried out through following research divisions.

1. Architecture and Physical planning Division (APP DIV)
2. Building Materials Division (BM DIV)
3. Building processes plant and Productivity Division (BPPP DIV)
4. Development, Construction and Extension Division (DCE DIV)
5. Efficiency of Building Division (EB DIV)
6. Fire Research Division (FR DIV)
7. Geotechnical Engineering Division (GE DIV)
8. International overseas Collaboration Division (IOC DIV)
9. Mathematical Modelling Group
10. Rural Buildings and Environment Division
11. Structural Engineering Division

The Buildings Materials division was found to have maximum number of publication of papers. This division is quite active in research also having maximum number of scientific staff. Table shows that 136 papers were published by Buildings Materials Division out of which 110 papers published in Indian Journal and twenty six in foreign journals. Mathematical modelling Group did not publish any paper in this decade as it came in to existence in 1989 only.

TABLE 3
DIVISION WISE DISTRIBUTION OF PAPERS IN
INDIAN AND FOREIGN PERIODICALS DURING 1980-90

S.NO.	YEAR	APP	BM	BPP	DOC	EB	FR	GE	IOC	MMG	RBE	SE	GENERAL	TOTAL PUB
		DIV	DIV	DIV	DIV	DIV	DIV	DIV	DIV	DIV	DIV	DIV		
		ij	fi	ij	fi	ij	fi	ij	fi	ij	fi	ij	ij	fi
1	1980	1 1	24 3	7 2	6 -	10 2	2 1	6 1	6 -	- -	3 -	- -	4 -	79
2	1981	- -	12 3	7 2	8 -	8 -	4 -	3 -	4 -	- -	- -	- -	- -	51
3	1982	1 -	15 -	6 -	1 -	11 2	1 3	1 -	2 -	- -	- -	- -	- -	43
4	1983	1 1	12 3	4 -	4 -	3 -	2 -	2 -	- -	- -	- -	- -	- -	32
5	1984	1 -	5 2	5 -	4 1	3 -	1 1	1 -	- -	- -	1 -	- -	- -	25
6	1985	- -	12 2	3 1	4 -	1 -	2 1	1 -	1 -	- -	- -	- -	- -	28
7	1986	- -	6 2	3 -	- -	- -	- -	1 -	- -	- -	- -	- -	- -	12
8	1987	- -	10 2	2 -	1 -	- -	1 -	- -	- -	- -	- -	1 -	- -	17
9	1988	- -	5 4	2 -	1 -	1 -	- -	1 -	- -	- -	- -	- -	6 3	23
10	1989	- -	4 2	- -	1 -	- -	- -	1 4	1 -	- -	- -	1 1	- -	15
11	1990	- -	5 3	2 1	- -	1 1	- -	- -	- -	- -	- -	- -	1 -	14
<i>Total</i>		4 2	110 26	41 6	30 1	38 5	10 9	15 7	13 1	- -	4 -	2 1	11 3	339
G.TOTAL		6	136	47	31	43	19	22	14	-	4	3	14	339

II = Indian Journals, FJ = Foreign Journals

TABLE 4
**CONTRIBUTION OF CBRI'S SCIENTISTS IN NATIONAL AND INTERNATIONAL CONFERENCES/
 SEMINARS DURING 1980-1989/90**

S.NO	APPDIV		BMDIV		BPPDIV		DCE DIV		EBDIV		FRDIV		GEDIV		IOCDIV		MMGDIV		RBEDIV		SEDIV		TOTAL		
	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	NAT	INT	SEL.	TOTAL	
1	3	5	2	3	2	3	2	3	1	3	1	2	3	-	7	1	-	-	-	-	-	-	-	-	37
2	-	6	1	3	2	5	1	6	1	6	2	-	6	1	6	1	-	-	-	-	-	-	-	-	34
3	-	32	-	1	-	2	6	3	1	2	4	1	-	2	4	1	-	-	-	-	-	-	-	-	52
4	1	3	6	2	-	2	3	2	1	2	1	-	9	-	2	-	-	-	1	-	-	-	-	-	33
5	1	3	11	15	4	2	3	-	11	1	1	-	3	2	-	-	-	3	2	-	-	-	-	-	65
6	9	17	13	2	9	1	-	4	5	-	-	-	10	1	-	-	-	-	-	-	-	-	-	-	71
7	1	12	6	1	8	-	-	-	1	1	3	4	4	-	4	-	-	4	-	-	-	-	8	-	54
8	1	17	2	2	9	3	-	7	3	-	2	4	2	2	2	-	-	11	3	-	-	-	-	-	68
9	1	25	-	-	1	3	-	4	-	4	1	-	-	4	2	-	-	1	-	-	-	-	2	-	44
10	-	11	1	-	-	-	-	-	2	1	-	4	1	1	1	-	2	-	-	-	2	-	-	-	25
Total	5	17	139	46	18	35	23	7	29	32	8	6	34	33	10	2	2	20	5	2	2	10	-	10	483

It has been found from table 4 which gives contribution of CBRI scientists in national and international conferences/ seminars during 1980 to 1989-90. 483 papers were presented by CBRI scientists in various national/international seminars/symposia. It can be inferred that the papers are easily accepted in the conferences in comparison to the papers published in Indian and foreign journals, which is evident from the figures viz. 339 papers, published in periodicals in compares to 485 papers were presented in various conferences.

TABLE 5

**YEARWISE DISTRIBUTION OF RESEARCH PAPERS
PRESENTED IN NATIONAL AND INTERNATIONAL
CONFERENCES**

S.NO	YEAR	NATIONAL CONFERENCES	INTERNATIONAL CONFERENCE	TOTAL
1	1980	19	18	37
2	1981	18	16	34
3	1982	45	7	52
4	1983	22	11	33
5	1984-85	25	40	65
6	1885-86	34	37	71
7	1986-87	31	23	54
8	1987-88	45	23	68
9	1988-89	39	5	44
10	1989-90	22	3	25
Total		300	183	483

From the table 5, it is evident that the Building Materials Division of CBRI had presented 185 paper's in various conferences out of which 139 papers were presented in national conferences followed by 46 papers presented in International conferences. The bar charts 3

and 4 give the position of yearwise contribution of various divisions of CBRI in national and international conferences.

The Geotechnical Engineering Division was active in presenting 67 papers in various conferences. It was interesting to note that it presented 34 papers in international conferences indicating the good quality of research work, it is pursuing.

The scientists of Efficiency of Building Division have surpassed the limit by presenting 32 papers in International conferences in comparison to 29 papers presented in national conferences. This indicates that the CBRI technology in the area of Building Physics is also acceptable to foreign countries.

Table 6 gives the impact factor of journals in which CBRI scientists published their papers. The total impact factor of 340 articles during the period 1980-90 is 38.371. The average impact factor per article is 0.113. The bar chart 5 clearly shows that maximum number of article (i.e.97) published in the journals having very low impact factor i.e. 0.001. On evaluation of publications, on the basis of impact factor, it was found out that 28.68 of articles were published in the journals having impact factor 0.001 (i.e very low), 56.9% of articles were published in the journals having impact factor 0.004 to 0.200 (i.e low to moderate), 5% of articles were published in the journals having impact factor 0.201 to 0.300 (i.e. moderate) and 9.4% of articles were published in the journals having impact factor 0.353 to 1.411 (i.e quite high).

Conclusions

India is one of the top most country in Asia having the vast majority of scientists publishing their research output in more than thousand Indian periodicals, such a large amount of scientific activity can not be neglected on the basis of quality. It is important that the work of the Indian scientific community is not cited by scientific community of developed countries. This can only be possible if the Indian science Citation Index is published

by INSDOC, which is doing a pioneer work in the field of bibliometrics. Help of Dr. E. Garfield, ISI, Philadelphia may be taken to achieve this gigantic task.

TABLE 6

TOTAL AND AVERAGE IMPACT FACTORS

<i>Number of articles</i>	<i>impact factor</i>	<i>Total</i>	<i>percentage of articles</i>
97	0.001	0.097	28.53
2	0.004	0.008	0.58
3	0.005	0.015	0.88
45	0.010	0.450	13.23
3	0.019	0.057	00.88
22	0.020	0.440	6.47
8	0.035	0.280	2.35
70	0.050	3.500	20.58
13	0.060	0.780	3.82
2	0.080	0.160	0.58
6	0.100	0.600	1.76
2	0.124	0.248	0.58
2	0.130	0.260	0.58
2	0.189	0.378	0.58
13	0.200	2.600	3.82
5	0.201	1.005	1.48
2	0.222	0.444	0.58
1	0.248	0.248	0.29
1	0.250	0.250	0.29
8	0.300	2.400	2.35
2	0.353	0.706	0.58
1	0.471	0.471	0.29

1	0.515	0.515	0.29
19	0.726	13.794	5.58
1	0.740	0.740	0.29
3	0.762	2.286	0.88
3	0.941	2.823	0.88
2	1.411	2.822	0.58
339	Total	38.371	100.00

Total impact factor of 340 article = 38.371

Average article = 0.113

BAR CHARTS

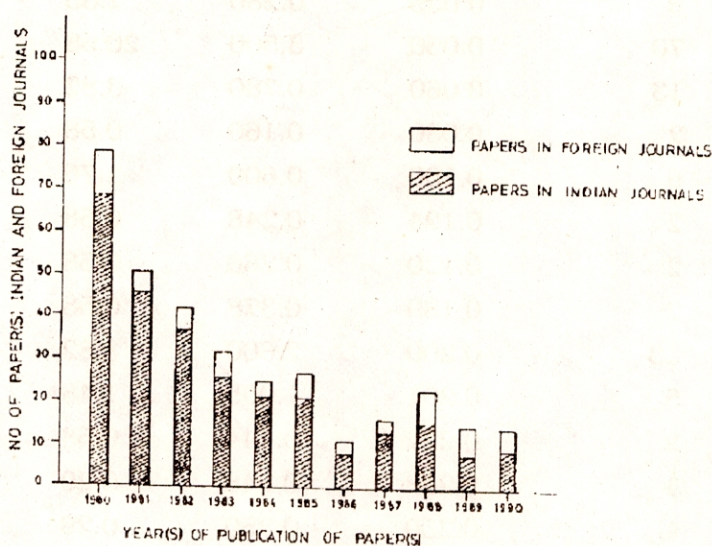


CHART-1
YEARWISE CONTRIBUTION OF C.B.R.I.'S SCIENTISTS
IN INDIAN AND FOREIGN JOURNALS

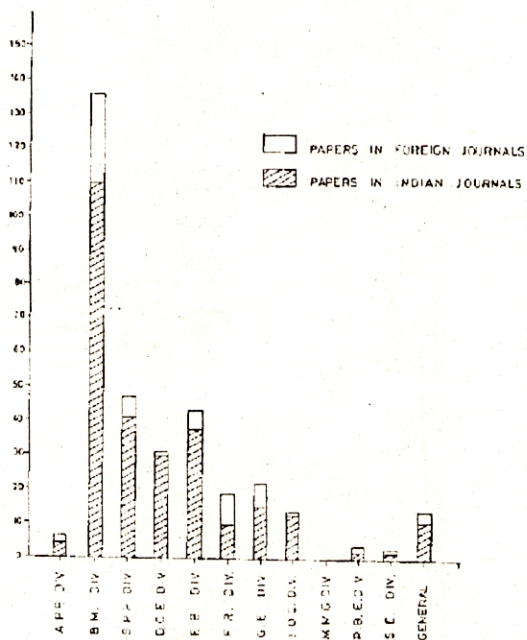


CHART 2
DIVISIONWISE DISTRIBUTION OF PAPERS IN INDIAN
AND FOREIGN PERIODICALS

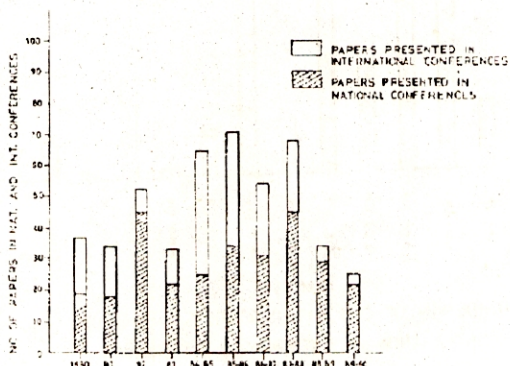


CHART-3
CONTRIBUTION OF C.B.R.I.'S SCIENTISTS IN NATIONAL AND
INTERNATIONAL CONFERENCES 1980-1990

A BIBLIOMETRIC STUDY OF ARTICLES PUBLISHED BY SCIENTISTS OF CBRI

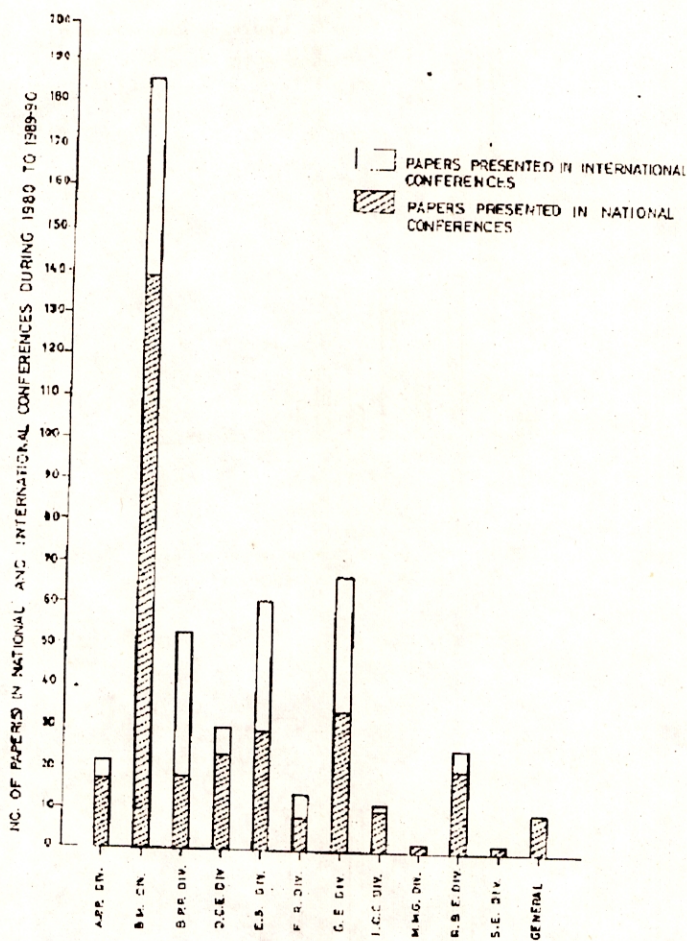


CHART-4
CONTRIBUTION OF C. B. R. I.'S SCIENTISTS IN NATIONAL AND INTERNATIONAL CONFERENCES DIVISIONWISE
1989-90

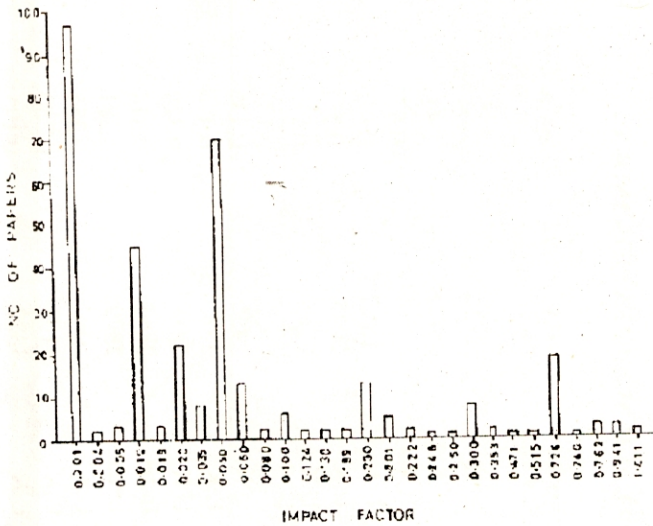


CHART-5

IMPACT FACTOR OF PAPERS IN INDIAN AND FOREIGN JOURNALS (1980-90)

TRENDS OF THE RESEARCH OUTPUT 1986-89 CBRI

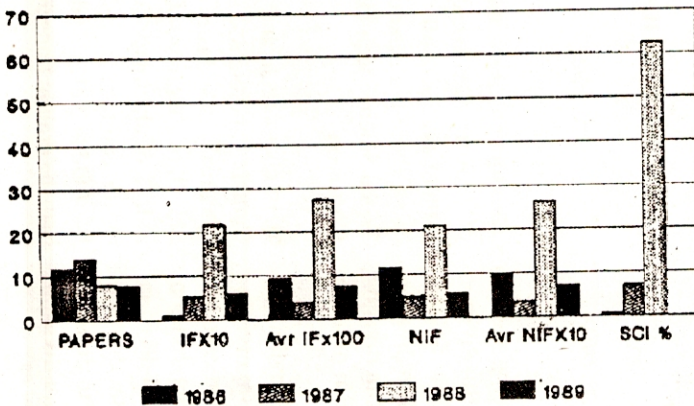


TABLE 7
SUGGESTED JOURNALS AS COVERED BY SCIENCE CITATION INDEX

S.NO. DIVISION	NAME OF JOURNALS	COUNTRY OF ORIGIN	RANKING AS PER IMPACT FACTOR	IMPACT FACTOR	IMMEDIACY INDEX
1	App division				
2	Bm division	U.K.	3233	0.217	0.000
3	Bm division	U.S.A.	700927	1.323	0.262
4	Bm division	U.S.A.	1459	0.872	0.072
5	Bm division	U.K.	1502	0.850	0.149
6	Bm division	U.K.	2042	0.581	0.167
		U.K.	2165	0.533	0.056
7	Bm division				
8	Bm division	U.K.	2456	0.435	0.149
9	Bm division	U.K.	2580	0.396	0.111
10	Bm division	U.K.	2818	0.329	0.058
11	Bm division	India	2864	0.314	0.210
12	Bm division	India	2879	0.281	0.054
13	Bm division	U.K.	3082	0.255	0.021
14	Bm division	U.K.	3103	0.250	0.040
		U.K.	3322	0.195	0.000

The table 7 indicated that 21 journals for scientists belonged to B.M. Division. These Journals have been arranged in decreasing impact factors, and ranking based upon impact factors. Similarly journals have been suggested for scientists belonging to BPPP Division, EB Division, FR. GE and SE Division respectively.

No doubt, engineering sciences are poor from the bibliometric citation point of view but the impact factor of the engineering sciences can be improved upon if the scientists of engineering disciplines carry a qualitative work in their respective fields and publish their work in foreign journals having highest impact factor and immediacy index. It is important to find that engineers do not generally cite authors whose work they use in their work.

The impact of research output of CBRI scientists can be improved if they publish their work in the standard journals with high impact factor suggested in and quote the authors exhaustively whose work they may use in writing their papers.

A list of journals with their impact factor is suggested division wise, if the CBRI, R and D work is reported in these journals, the research output of CBRI is bound to rise in future.

Acknowledgment

The present paper is published with the permission of Director, C.B.R.I. Roorkee(U.P.) India and the help in improving the paper by Dr. B.K. Saxena, Dy. Director, Head of E.B. Division, C.B.R.I. Roorkee is also gratefully acknowledged.

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