

Productivity of Research Publications of Indian Institute of Rice Research Published during 1990-2014 - A Bibliometric Study

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Abstract

A bibliometric analysis of publications of the research workers of Indian Institute of Rice Research was done for the period from 1990 to 2014 to assess the publication productivity in various subjects. The classification and analysis of publications indicated various proportions in terms of nature of articles published in peer reviewed journals, newsletters, popular articles, in-house publication as well as those presented in conferences etc. An interesting trend surfaced over time was gradual increase in multi-authored contributions highlighting the increased belief in multi-disciplinary research cutting across institutions.

Keywords: Publication productivity, bibliometric analysis, multi-authorship

Introduction

Agriculture is closely linked with production of the fundamental elements of Man's food, shelter and clothing. Agriculture has dominant role in Indian economy contributing nearly half of the national income. Indian Council of Agricultural Research (ICAR), since its inception in 1929, with its network of research institutes, research centers and research stations, plays a dominant role in the research activities on various crops. Rice research is one of the most important crop based research in India as rice is a staple food for more than half of the population and is the focus of research across the globe.

Research output analysis is a kind of SWOT (strengths, weaknesses, opportunities and threats) analysis that provides a stimulus in furthering the research effort in any discipline. Hence an attempt was made to assess the productivity of publications in research conducted by Indian Institute of Rice Research during the period between 1990 and 2014.

Objectives

The major purpose of the present investigation was to examine the trend in the research conducted during the twenty five years on various aspects of rice with the objectives;

- To identify the authors 'productivity
- To identify the predominant type of publications
- To measure the growth and development of research publication productivity of IIRR and
- To find out the single author vs. multi authored papers.

Review of Literature

Reports many similar studies have been reviewed in this part. Ramesh and Mahapatra (2012) used 2001-2010 Scopus database related to agricultural science; Rathinasabapathy (2012) analysed the publications on goat research utilizing the CAB direct online data pertaining to 1960-2012; Gupta et al. (2012) assessed the database on material science from 2001 to 2010; Gupta et al. (2011) on diabetes (1999-2008); Kshiting and Gupta (2011) on semantic web using Scopus database; Gupta and Bala (2011b) on Science and Technology (1996-2010); Varaprasad and Ramesh (2011) on Indian chemical research (1987-2007). Karpagam et al. (2010) on Nanoscience and Nanotechnology pertaining to period between 1938 and 2009. Jain and Kumar (2010)⁹ on soya bean research using International crop CD database; Krishnamurthy et al. (2010) on Meteorology using publication data of period from 2006 to 2009. Mohan (2010) on Indian research in Nanoscience using science citation index (1982-2008);



Methodology

The present study has analysed the contributions made by IIRR Scientists / Research workers. The publication data were collected from the Annual Reports of IIRR for the study period from 1990 to 2014. All the bibliographic details were imported to MS-Excel for data manipulation and statistical analysis.

Results and Discussion

Table 1. Indicated the classification of various publications of research workers of IIRR appeared during the period 1990-2014 was shown. The total numbers of publications were 2485. It was observed that the highest number of papers i.e., 259 (10.49 %) had been published in 2014. In 1994 there were only 11 articles (0.44%) i.e., least productivity. On an average 3.99 papers had been published every year since 1990.

Table 2 showed the five yearly distributions of publications. The highest number of contribution in Indian journals had been 581 (23.35 %) and 306 (12.30 %) papers had been published in foreign journals. The papers in Conferences and Seminars were 1000 out of which 860 (34.69 %) papers have been contributed in National Conferences and 140 (5.63 %) in conferences and seminars at Internal level. The highest number of contributions was during 2010-2014. Rests of 36.30 % contributions were as Book Chapters, Popular Articles and Newsletters.

Table: 3 showed that 887 (35.73 %) papers had been contributed in National and International journals. Indian Journal of Plant Protection had the highest number with 74 (8.34 %) papers, followed by *Oryza* 63 (7.10 %) papers. The scientists used 262 journals for 887 contributions. 145 (16.1 %) journals received only one contribution each while 34 % articles had been published in 7 journals. Rest of 50 % articles had been published by 110 journals.

Table 4 showed that 658 (26.48 %) research articles were in Plant Breeding followed by 398 (16.02 %) research articles in Entomology. It was apparent from the table that that almost all the major branches of agriculture had been covered by the scientists of IIRR.

Table 5 showed the authorship pattern. It differed in every research article. Generally articles have two or three authors but at the same time there are as many as four, five or even more than 10 authors. The authorship in each research article was shown in Table 5. It revealed that there were 472 (18.97 %) papers had four authors, 342 (13.75 %) papers had have two authors, 32 (12.10 %), 187 (7.52 %), 145 (5.83 %), 109 (4.38 %) while 244 (9.81 %) papers had

only one authors papers with five authors to ten authors and more. It showed that there were multiple authorship trends among the scientist of IIRR. Thus there were 2485 articles with 2488 authorship as shown in Table 5.

The Indian Institute of Rice Research (IIRR) is a major institute of research in Rice under ICAR. The scientists of IIRR had contributed significant research papers, the scientists had contributed 2485 papers in leading Indian and International Journals and Conferences. The study revealed that rice research was well coordinated research. The trend indicated the increase in the contribution by multiple authors with time indicating the concept of team work in multi-disciplinary and multi-institutional research.

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Table 1. Year wise distribution of contributions and communications

S. No.	Year	Nat./Int. Journals	Popular Articles	Nat. /Int. Symposium	Nat. /Int. Newsletters	Book Chapters	In-house publications	Total	%
1	1990	10	0	3	1	1	0	15	0.60
2	1991	14	0	2	0	0	0	16	0.64
3	1992	14	0	1	1	2	0	18	0.72
4	1993	8	0	3	7	1	0	19	0.76
5	1994	9	0	0	2	0	0	11	0.44
6	1995	23	14	20	4	9	0	70	2.82
7	1996	17	15	60	0	8	0	100	4.02
8	1997	20	0	20	2	2	0	44	1.77
9	1998	24	4	27	28	13	0	96	3.86
10	1999	34	8	21	3	3	0	69	2.78
11	2000	28	4	46	8	8	1	95	3.82
12	2001	43	0	47	5	7	2	104	4.19
13	2002	36	20	71	15	9	3	154	6.20
14	2003	39	12	43	11	37	1	143	5.75
15	2004	36	3	27	0	4	4	74	2.98
16	2005	40	0	53	3	5	3	104	4.19
17	2006	43	0	84	3	1	5	136	5.47
18	2007	39	1	51	3	7	6	107	4.31
19	2008	40	10	57	7	6	4	124	4.99
20	2009	42	8	60	4	10	10	134	5.39
21	2010	48	10	62	22	9	4	155	6.24
22	2011	53	2	27	0	4	10	96	3.86
23	2012	64	7	94	6	24	8	203	8.17
24	2013	70	6	20	12	22	9	139	5.59
25	2014	93	11	104	12	31	8	259	10.42
	Total	887	135	1003	159	223	78	2485	100

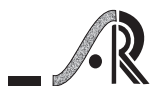


Table 2. IIRR five yearly distribution of contributions

S. No	Name	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%
1	Indian Journals	46	98	143	132	162	581	23.38
2	Foreign Journals	10	20	39	72	166	307	12.35
3	National Conferences/ Seminars / Symposiums	7	120	180	281	274	862	34.69
4	International Conferences / Seminars / Symposiums	2	27	54	24	33	140	5.63
5	In-house Publications	0	0	11	28	39	78	3.14
6	News letters	11	37	39	20	52	159	6.40
7	Book chapters	4	35	65	29	90	223	8.97
8	Popular Articles	0	41	39	19	36	135	5.43
10	Total	80	378	570	605	852	2485	100

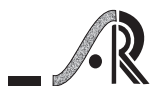
Table 3. Distribution of most productive journals during 1990-2014

S.No.	Indian Journals	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%
1	Indian Journal of Plant Protection	9	14	24	16	11	74	8.34
2	Oryza	7	12	11	22	11	63	7.10
3	Journal of Mycology and Plant Pathology	1	2	17	16	2	38	4.28
4	Indian Journal of Agricultural Science	9	5	8	6	7	35	3.95
5	Journal of Research ANGRAU	-	6	16	4	9	35	3.95
6	Indian Journal of Genetics and Plant Breeding	1	12	3	7	6	29	3.27
7	Progressive Research International Journal	-	-	-	2	26	28	3.16
8	Journal of Biological Control	1	4	7	6	4	22	2.48
9	Indian Journal of Plant Physiology	7	4	1		6	18	2.03
10	Current Science		7	5	3	1	16	1.80
11	1 journal with 15 articles	0	0	3	5	7	15	1.69
12	1 journal with 9 articles	0	0	0	1	8	9	1.01
13	4 journals with 8 articles each	1	5	11	5	10	32	3.61
14	7 journals with 7 articles each	2	6	12	11	18	49	5.52

S.No.	Indian Journals	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%
15	6 journals with 6 articles each	8	4	5	12	7	36	4.06
16	7 journals with 5 articles each	1	3	5	7	19	35	3.95
17	13 journals with 4 articles each	1	7	8	12	24	52	5.86
18	20 journals with 3 articles each	4	4	11	16	25	60	6.76
19	48 journals with 2 articles each	1	11	12	19	53	96	10.82
20	145 journals with 1 articles each	2	12	23	34	74	145	16.35
Total	262	55	118	182	204	328	887	100

Table 4. Subject Analysis of Contributions

S. No.	Subjects	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%	Rank
1	Plant Breeding	20	118	159	132	229	658	26.48	I
2	Entomology	20	61	93	117	107	398	16.02	II
3	Agronomy	7	49	73	73	66	268	10.78	III
4	Plant Biotechnology	3	25	36	65	108	237	9.54	IV
5	Plant Pathology	14	38	41	63	58	214	8.61	V
6	Crop Physiology	7	20	23	24	68	142	5.71	VI
7	General	10	32	39	28	32	141	5.67	VII
8	Agricultural Extension	0	8	25	14	66	113	4.55	VIII
9	Soil Science and Soil Chemistry	4	25	20	15	31	95	3.82	IX
10	Nematology	1	1	23	21	27	73	2.94	X
11	Agricultural Economics	2	6	6	12	11	37	1.49	XI
12	Computer Science and Statistical Applications	0	1	11	11	14	37	1.49	XII
13	Agricultural Engineering	1	3	13	3	0	20	0.80	XIII
14	Soil Science	0	3	1	1	9	14	0.56	XIV
15	Soil Science and Microbiology	0	3	2	3	5	13	0.52	XV
16	Agricultural Microbiology	0	0	0	0	7	7	0.28	XVI
17	Seed Technology	1	0	2	4	0	7	0.28	XVII
18	Post Harvest Technology	0	0	4	1	1	6	0.24	XVIII



S. No.	Subjects	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%	Rank
19	Agricultural Chemistry	0	0	0	0	5	5	0.20	XIX
	Total	90	393	571	587	844	2485	100	
	%	3.62	15.81	22.98	23.62	33.96	100		

Table 5: Authorship Pattern in 5 yearly contributions

S. No	Name	1990-94	1995-99	2000-04	2005-09	2010-14	Total	%
1	Single author	15	46	57	53	73	244	9.81
2	Two Authors	32	95	94	56	65	342	13.75
3	Three Authors	25	97	158	118	74	472	18.97
4	Four Authors	4	66	107	120	135	432	17.36
5	Five Authors	3	51	78	94	95	321	12.90
6	Six Authors	0	12	26	58	91	187	7.52
7	Seven Authors	0	9	20	30	86	145	5.83
8	Eight Authors	0	1	9	30	69	109	4.38
9	Nine Authors	0	2	10	14	35	61	2.45
10	Ten Authors	0	0	6	11	27	44	1.77
11	More than ten Authors	0	0	5	22	104	131	5.27
	Total	79	379	570	606	854	2488	100