

Scientific research productivity on Orissa: A bibliometric analysis

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Describes the growth of scientific research literature on Orissa published during 1985-2004. Includes 875 research papers from forty different journals. Analyses the data by their authorship pattern, year wise growth, subject wise break up of papers, category of journals, place of origin, length of papers, and productivity of journals.

Introduction

Scientific and technological research plays a very significant role in the economic, social and physical development of a country. The importance of S&T and its application to meet the economic, industrial, trade and societal challenges has been recognized in most South Asian countries, as evident from the emphasis placed in their development plans and policies¹. Scientific research is culminated in scientific writing which is considered as a medium for promoting self-interest on the road to recognition and enhancing professional reputation in one's field of specialization. Scientific literature is the mirror of scientific research around the world. All scientific works end up as publications in the open literature, most of it in refereed journals. Research output in journals acts as significant measure of research activity in a field or subfield².

Scientific research in various areas is being taken up at different levels such as, central government organisations, state government organisations, technical and engineering institutes, R&D organizations and at individual levels. In this study, the growth of scientific research literature in Orissa is studied through a bibliometric analysis.

Objectives of the study

The prime objectives of the above study are as follows:

- To determine the trend of growth of research papers
- To observe the authorship pattern
- To classify the scientific literature according to subjects
- To find out the journal category
- To identify the journals' origin such as Indian and foreign
- To determine the length of papers published; and
- To find out the ranking of journals

Methodology

Orissan Studies, a bibliographical compendium is the base of the present study³. Data was also collected from *Research References on CD*, *Medline* database, and *Guide to Indian Periodical Literature*. All important local journals published in Orissa which are not included in any secondary periodicals were also used. Annual reports of organizations were also consulted. Eight hundred and seventy five research papers were thus identified for the period 1985 to 2004. Microsoft Access 2000 was used for data entry and appropriate tables were created for analysis of data.

Analysis of data

Table 1 depicts the number of research papers published from 1985 to 2004. The study shows that, the highest number of articles 68 (7.77%) were published during

Table 1 - Year wise distribution of research papers

S. No.	Year	No. of papers	%
1.	1985	27	3.09
2.	1986	27	3.09
3.	1987	34	3.89
4.	1988	26	2.97
5.	1989	26	2.97
6.	1990	33	3.77
7.	1991	35	4.00
8.	1992	42	4.80
9.	1993	28	3.20
10.	1994	41	4.68
11.	1995	33	3.77
12.	1996	39	4.46
13.	1997	53	6.06
14.	1998	54	6.17
15.	1999	55	6.29
16.	2000	61	6.97
17.	2001	63	7.20
18.	2002	64	7.31
19.	2003	66	7.54
20.	2004	68	7.77
Total		875	100.00

Table 2 - Authorship pattern

S. No.	No of authors	No. of papers	%
1.	One	349	39.89
2.	Two	253	28.92
3.	Three	95	10.86
4.	Four	144	16.45
5.	Anonymous	34	3.88
Total		875	100.00

Table 3 - Subject-wise breakup of papers

S. No.	Subjects	No. of papers	%
1.	Agriculture	209	23.89
2.	Health	182	20.80
3.	Wildlife	157	17.94
4.	Plant Resources	147	16.80
5.	Minerals	126	14.40
6.	Environment	54	6.17
Total		875	100.00

the year 2004. The lowest numbers of papers 26 (2.98%) each were published during 1988 and 1989. During the initial period of the study, the publication of the scientific papers on Orissa is very less compared to later periods. It is interesting to note that the growth trend of scientific paper publication on Orissa is positive from the year 1995 to 2004.

Authorship pattern

Data was analysed to determine authoring pattern which indicates the distribution of single as well as multiple authored publications.

Table 2 shows that out of 875 papers, 349 (39.89 %) are contributed by single authors and 492 (56.22 %) by joint authors such as two, three, four and above. Only 34 (3.88%) out of 875 papers appear to be anonymous. The authorship pattern clearly shows that, most of the papers are the product of collaborative research.

Subject wise breakup of papers

One of the basic objectives of this paper was to ascertain the subject(s) that predominate the scientific research on Orissa. Information pertaining to the thrust area of research, thus, elicited from the bibliographical compendium is reflected in Table 3 which depicts the subject-wise distribution of research papers.

From the bibliographical references, it was found that only six subjects, as indicated in Table 3, were found to pertain to scientific and technological discipline. The highest number of papers, i.e. 209 (23.89 %) has been contributed in the field of Agriculture. It is due to the fact that agricultural research is the order of the day and the state of Orissa being a developing state of the country conducts more research on agricultural science. Health occupies the second place with 182 (20.80 %) papers. Studies on wildlife and plant resources are nearly equal with 157(17.94%) and 147(16.890%) respectively. The subject mining and minerals has 126 (14.4 %) research

Table 4 - Journal category

S. No.	Journal type	No. of papers	%
1.	Scientific	602	68.80
2.	Non-Scientific	273	31.20
	Total	875	100.00

Table 5 - Origin of journal category

Journal origin	No of papers	%
Indian	600	68.58
Foreign	275	31.42
Total	875	100.00

Table 6 - Distribution of papers according to length

S. No.	No. of pages	No. of papers	%
1.	1	76	8.69
2.	2	90	10.29
3.	3	94	10.74
4.	4	97	11.09
5.	5	87	9.94
7.	7	79	9.02
8.	8.	65	7.42
9.	9	59	6.74
10.	10	26	2.97
	Total	875	100.00

articles and Environment has got the least of 54 (6.17%) papers during the period.

Category of journals

A particular class of journal often helps to determine the growth of literature on a specific discipline. The entire output was classified under two broad categories such as scientific and non-scientific journals.

Table 4 reflects the type of journals in which scientific literature on Orissa are published. While 602 (68.80 %) research papers are published in scientific journals, only

273 (31.20%) papers are published in non-scientific journals.

Origin of Journals

One of the basic objectives of the paper was to ascertain the place of origin of the journals that published the papers under study.

Table 5 shows that 600 (68.58%) papers have been published in national journals and the remaining 275 (31.42%) papers in foreign journals.

Length-wise distribution of papers

Though the length of a publication does not necessarily demonstrate the quality of the research, but it often reveals the comprehensive and elaborate effort made by the author on a specific piece of research carried out on the subject.

Table 6 reflects the distribution of papers according to length. It is found that 26 (2.97%) articles have the maximum of 10 pages while 76 (8.69 %) articles are of only one page length. It was found that majority of the articles were of 6 pages constituting 23.08 % followed by 97 (11.09%) articles of four pages long.

Table 7 - Journal productivity

S. No.	Name of the Journal	No. of articles
1.	<i>Journal of Communicative Diseases</i>	54
2.	<i>Journal of Bombay Natural History Society</i>	54
3.	<i>Orissa Journal of Agricultural Research</i>	54
4.	<i>Plant Science Research</i>	54
5.	<i>Indian Journal of Malaria</i>	39
6.	<i>Orissa Journal of Horticulture</i>	39
7.	<i>Journal of Econ Tax Bot</i>	39
8.	<i>Indian Forester</i>	39
9.	<i>Indian Journal of Med Research</i>	39
10.	<i>Community Forestry</i>	31
11.	<i>Journal of Family Welfare</i>	31
12.	<i>Microbial research</i>	31
13.	<i>Indian veterinary Research</i>	31
14.	<i>Cytobiosis</i>	31
15.	<i>Zoos' Print</i>	31
16.	<i>Indian Journal of Leprosy</i>	24

(Contd)

Table 7 – Journal productivity (Contd)

S. No.	Name of the journal	No. of articles
17.	<i>Indian Pediatrics</i>	24
18.	<i>Corp Research</i>	24
19.	<i>Indian J Plant Genetics Resources</i>	24
20.	<i>Indian J of Forestry</i>	24
21.	<i>Indian Journal of Animal Science</i>	24
22.	<i>Indian Journal of Agricultural Science</i>	24
23.	<i>Bihang Journal</i>	24
24.	<i>Indian Journal of Poultry Science</i>	6
25.	<i>Journal of Zoological Society of India</i>	6
26.	<i>The Snake</i>	6
27.	<i>Bio Science Research Bulletin</i>	6
28.	<i>Gerontology</i>	6
29.	<i>Indian Journal of Cancer</i>	6
30.	<i>Health for the Millions</i>	6
31.	<i>Microbial research</i>	6
32.	<i>Fafai Journal</i>	6
33.	<i>Agronomy Digest</i>	4
34.	<i>Indian Farming</i>	4
35.	<i>J Association of Physicians in India</i>	4
36.	<i>Indian Heart Journal</i>	4
37.	<i>Leprosy Rev</i>	4
38.	<i>Phykos</i>	4
39.	<i>Ethnobotany</i>	4
40.	<i>Current Science</i>	4
	Total	875

The journals publishing the 875 papers are given in Table 7. It is found that journals such as *Journal of Agricultural Research*, *Journal of Communicative Diseases*, *Plant Science Research*, *Orissa Journal of Agricultural Research* and *Journal of Bombay Natural History Society* have published 54 papers each. While five journals have published 39 articles each, 31 articles each have been published by six journals and four articles have been published by eight journals each.

Conclusion

Development of a state like Orissa depends on the scientific and technological research. The present study reflects the growth of scientific research in and on Orissa. It is seen that there is a positive growth of research papers published from 1995 to 2004. It was found that majority of authors prefer to publish their papers in collaboration with others. It was also found that research on agricultural science is more compared to other subjects. It is interesting to note that nearly 31% of the scientific literature is published in non-scientific journals. This may result in the scientific papers going unnoticed by scientific workers. More papers are published in Indian journals compared to foreign journals. It was found that majority of papers were six pages long.

References

1. Gupta B M, Munshi UM & Mishra P K, Regional collaboration in S&T among South Asian countries, *Annals of Library & Information Studies*, 51 (4) (2004) 121-132.
2. Bhattacharya S and Gupta B M, Towards developing national bibliographical databases in science and technology in India, *University News*, 42 (4) (2004) 1-5.
3. Mahapatra R K, *Orissan Studies: A Bibliographical Compendium of Research Papers on Orissa in English from 1983 to 2002*, Surabhi Publications, Bhubaneswar, 2004.