

Geographical Information System Research in India: A Scientometric Mapping of Publications

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Abstract

We measure India's contribution to Geographical Information System (GIS) research. In the years 1989-2020 Indian researchers have published 694 papers in 291 journals. Researchers from 1397 institutions have published. There was a small increase in the number of articles on Geographical Information System from 2003 with 10 publications to 2019 with 75 Publications. Indian scientists had highest (45) international collaborative publications scientists with USA and received 2497 Global Citation Scores followed by UK with 25 publications and recorded 2292 Citations, Australia with 18 and recorded 2166 Citations, Germany with 15 publications and recorded 2118 Citations. Findings revealed that Indian Institute of Technology with 74 records (10.7%) is the most productive institution followed by Anna University Chennai 29 (4.2%), Jawaharlal Nehru University 18 (2.6%), Indian Institute of Science 15(2.2%), Birla Institute of Technology, Indian Institute of Remote Sensing and National Institute of Technology 14 (2.0%) respectively. Bharathidasan University possessed 22nd position with 7 (225 Citations) records. The leading journals contributing to Indian research in Geographical Information System research are: Arabian Journal of Geosciences with 306 publications and recorded 202 Citations followed by Current Science with 31 Publications and received 272 Citations, Journal of the Indian Society of Remote Sensing with 30 Publications. The highest number of Citations received by LANCET with 1450 (2 Publications) followed by International Journal of Remote Sensing with 1120, Environmental and Earth Sciences with 613, Living Reviews in Relativity 542 (2 Publicaitons) and Water Resource Management with 514 (20 Publications). These findings provide new insight into the publication trends in Geographical Information System.

Keywords: GIS, Scientometrics, Geographical Information System, Citations, Bibliometrics

Introduction

In this paper, we analyse India's contribution to Geographical Information System research. The study intends to explore the blueprints of scholarly communication of Indian Geographical Information System for the period 1989 to 2020 and determine to exposure the quality of contributions. Scientometrics' is the branch science of science that describes the output traits in terms of organizational research structure, resource inputs and outputs, develops

benchmarks to evaluate the quality of information output. Scientometric research publications are a quantitative measure for the basic research activity in a country. Scientometrics is one of the most important measures for the assessment of scientific productions. Growth in literature has become a major concern for the scientists, scholars, and library professional as they try to keep themselves abreast with new advances in their subject, and information professionals try to organize this knowledge. The word ‘growth’ refers to an increase, expansion in actual size, implying a ‘change of state’. Change in size of literature over a specific period of time is termed as ‘growth of literature’. A systematic study of the increase in scientific literature, scientific community and institutions etc. facilitates quantitative and qualitative understanding of science and various scientific phenomena.

Objectives of the Study

The main objectives of the study is to present the growth of Geographical Information System research published during 1989-2020 as per the Web of Science database and make the quantitative and qualitative assessment by way of analysing various features of research output such as growth of publications and Citations, Impact factor, international collaboration, highly productive Institutions, Channels of Communications used by the researcher, highly preferred Journals, author impact and highly cited papers.

Experimental Methods

The data for the present study were retrieved from ISI Web of Science database is currently maintained by Clarivate Analytics (including Science Citation Index (SCI), Social Science Citation Index (SSCI) and Arts & Humanities Citation Index (AHCI)). The data are extracted from Web of Science on May 2020 by using suitable search syntax (Geographical Information System with topic and India with address), the data has been downloaded for the period 1989-2020. The collected data were analysed the data as per objectives of the study using Histcite, VosViewer and Biblioshiny (R and R Studio). The bibliographic fields were analysed by publications, Citations, Countries (International Collaboration), Authorships, Institutions, highly cited papers and Journals.

Main Information about the Collection

Description	Results
Documents	694

Sources (Journals, Books, etc.)	291
Keywords Plus (ID)	1571
Author's Keywords (DE)	2002
Period	1991 - 2020
Average citations per documents	18.95
Authors	4120
Author Appearances	5885
Authors of single-authored documents	31
Authors of multi-authored documents	4089
Single-authored documents	33
Documents per Author	0.168
Authors per Document	5.94
Co-Authors per Documents	8.48
Collaboration Index	6.19

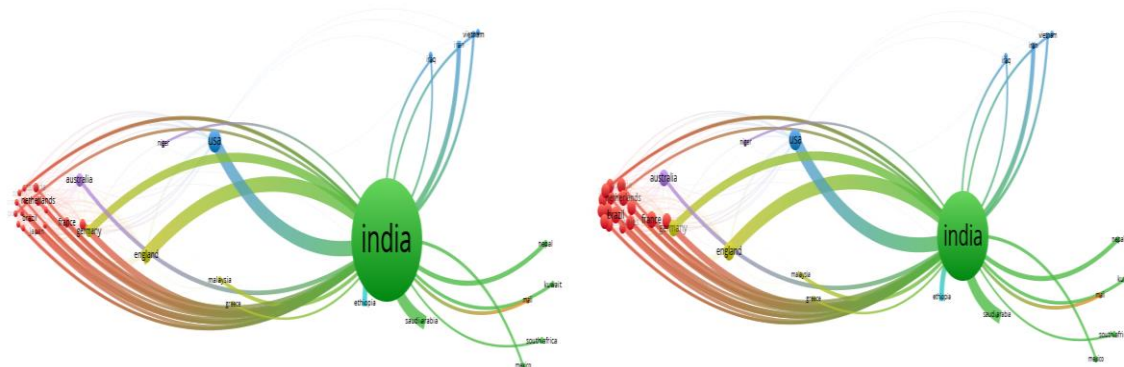
International Collaboration

Every country has realizing the importance of collaborative research to engage in many scientific problems resulting in many international collaborations. Table 1 and Figures provide international collaboration pattern with Indian institutions in Geographical Information System. Indian Institutions had the highest number of collaborative publications with countries like the USA, UK, Australia, Germany, France, China, Canada, Netherlands and Brazil. The International collaboration trends are given in Table 1. Out of 694 publications (13097 Citations), there were 689 publications were international collaborative publications with 102 countries. Indian scientists had highest (45) international collaborative publications scientists with USA and received 2497 Global Citation Scores followed by UK with 25 publications and recorded 2292 Citations, Australia with 18 and recorded 2166 Citations, Germany with 15 publications and recorded 2118 Citations. It is noted that 85 Countries recorded minimum of 1000 Citations and 92 Institutions recorded more than 100 Citations.

Table 1 shows Geographical wise distribution of Collaboration

#	Country	Records	TGCS	Country	Records	TGCS
1	USA	45	2497	Sweden	4	1484
2	UK	25	2292	Taiwan	4	1992
3	Australia	18	2166	Belgium	3	1740
4	Germany	15	2118	Egypt	3	1249
5	France	13	2175	Ghana	3	1498
6	Peoples R China	12	2087	Greece	3	1210

7	Canada	11	2048	Hungary	3	565
8	Netherlands	11	2121	Kuwait	3	4
9	Brazil	8	2128	New Zealand	3	1466
10	Ethiopia	7	1486	Poland	3	1740
11	Vietnam	7	1460	Portugal	3	1331
12	Iran	6	1460	Sri Lanka	3	1205
13	Malaysia	6	1236	Argentina	2	261
14	Saudi Arabia	6	1517	Bangladesh	2	1202
15	South Africa	6	1536	Benin	2	1450
16	Austria	5	1458	Denmark	2	1450
17	Japan	5	1535	Iraq	2	1199
18	Nepal	5	1235	Lebanon	2	1450
19	South Korea	5	1766	Luxembourg	2	1450
20	Spain	5	2044	Mali	2	11
21	Switzerland	5	1512	Mexico	2	1198
22	Colombia	4	1469	Niger	2	16
23	Italy	4	1992	Nigeria	2	1450
24	Kenya	4	1249	Oman	2	1450
25	Pakistan	4	1466	Panama	2	1205
26	Russia	4	1992			

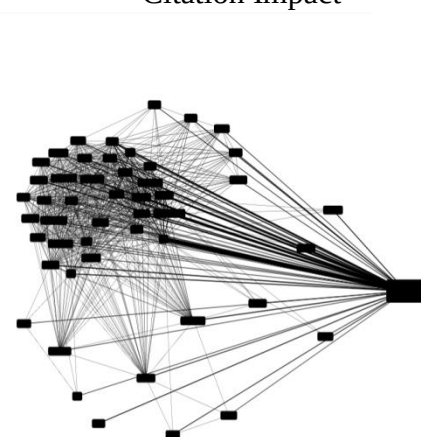


Publication Impact

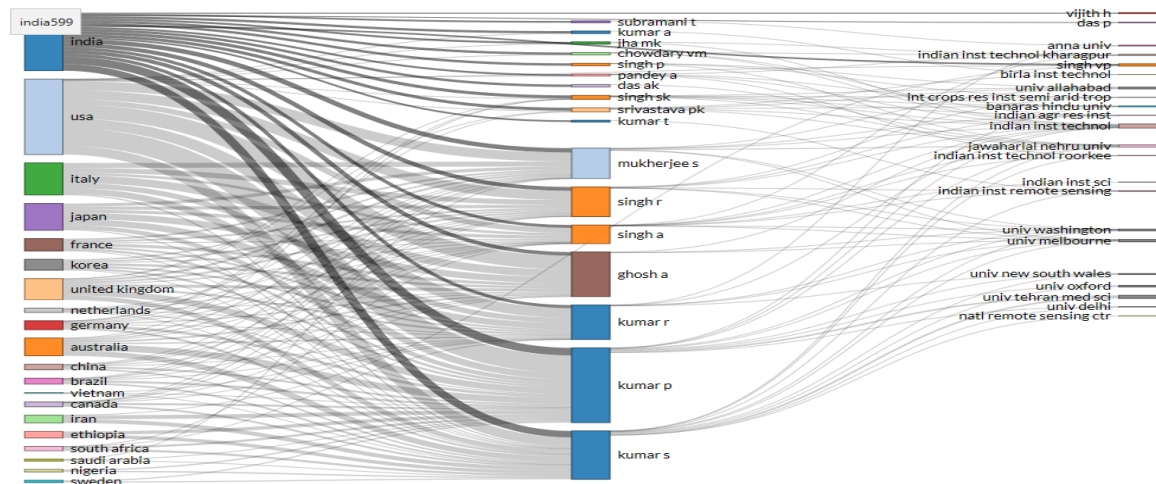
Citation Impact



Country Collaboration Map



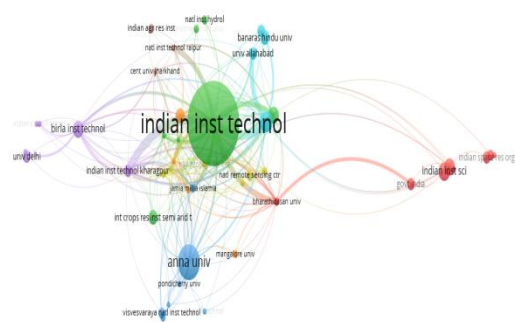
Country Collaboration Network



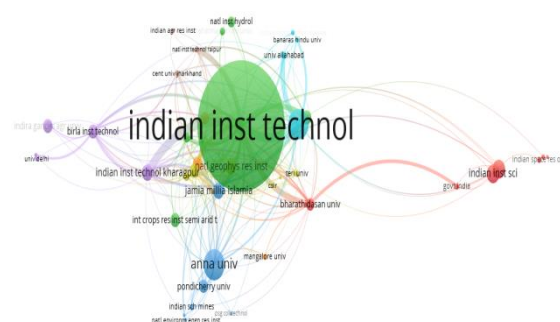
Three Field Plot (Country, Author and Institutions)

Institution wise distribution of Publications and Citations

It was practical to analyze the publications based on institutional distribution of contributors. A total number of 379 records (54.61%) have been contributed by 30 institutions during 1989 to 2020. Table 2 shows the most prolific institutions in the field of Geographical Information System. Findings revealed that Indian Institute of Technology with 74 records (10.7%) is the most productive institution followed by Anna University Chennai 29 (4.2%), Jawaharlal Nehru University 18(2.6%), Indian Institute of Science 15(2.2%), Birla Institute of Technology, Indian Institute of Remote Sensing and National Institute of Technology 14(2.0%) respectively. Bharathidasan University possessed 22nd position with 7 (225 Citations) records.



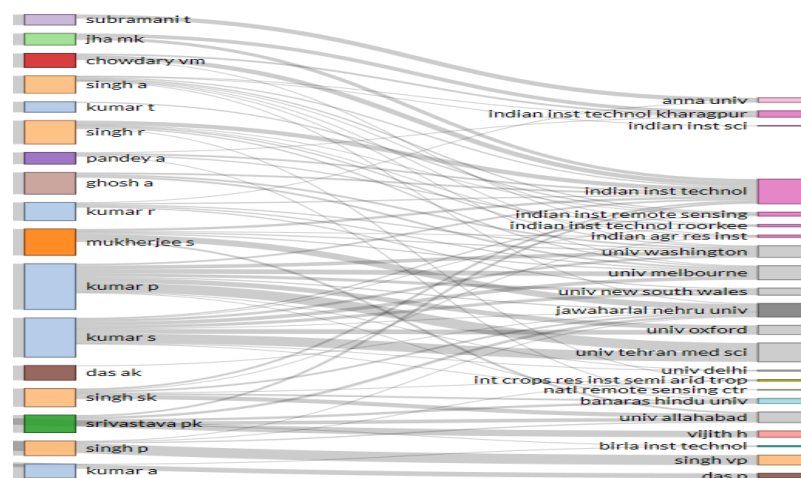
Publication Impact



Citation Impact

It reveals the ranking list of highly productive Research Institutions in India based on their citations. According to the web of science database Indian Institute of Technology (IIT), recorded the highest number of Citations with 2826 for 74 Publications, followed by Public

Anna University



#	Institution	Records	%	TLCS	TGCS
1	Indian Institute of Technology	74	10.7	162	2826
2	Anna University - Chennai	29	4.2	17	537
3	Jawaharlal Nehru University -Delhi	18	2.6	57	534
4	Indian Institute of Science - Bangalore	15	2.2	2	327
5	Birla Inst Technology	14	2.0	15	253
6	Indian Inst Remote Sensing	14	2.0	29	245
7	National Institute of Technology	14	2.0	4	324
8	Banaras Hindu University -Varanasi	12	1.7	2	104
9	Int Crops Res Inst Semi Arid Trop	12	1.7	9	241
10	ISRO	12	1.7	20	221
11	University of Delhi	11	1.6	1	1293
12	Government of India	10	1.4	5	113
13	Indian Inst Technology Kharagpur	10	1.4	30	290

14	Indian Inst Technol Roorkee	10	1.4	0	102
15	Indian Space Res Org	10	1.4	3	113
16	University of Allahabad	10	1.4	9	125
17	Natl Remote Sensing Agcy	9	1.3	4	99
18	Natl Remote Sensing Ctr	9	1.3	1	42
19	Visvesvaraya National Institute of Technology	9	1.3	2	31
20	Indian Agr Res Inst	8	1.2	4	85
21	Natl Inst Hydrol	8	1.2	4	189
22	Bharathidasan University	7	1.0	42	225
23	Jamia Millia Islamia	7	1.0	17	289
24	Mahatma Gandhi University	7	1.0	2	145
25	Mangalore University	7	1.0	9	109
26	Natl Environm Engn Res Inst	7	1.0	3	67
27	Sri Venkateswara University	7	1.0	27	166
28	TERI University	7	1.0	8	133
29	Andhra University	6	0.9	30	183
30	CSIR	6	0.9	1	59

Year wise Publication and Citations Impact

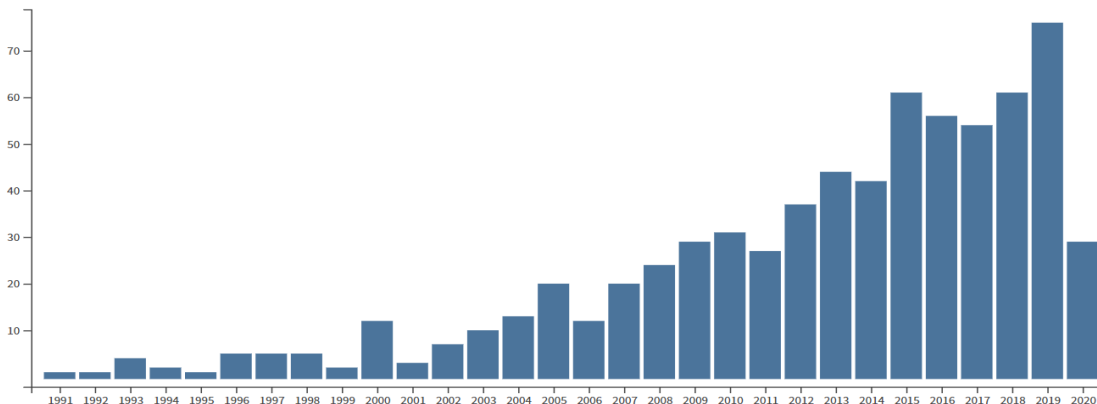
A total of 694 publications were published in GIS during 1989-2020 and these publications received 13150 Citations. The Average Citations Per Article is 18.95 and the overall H-index is 52 in the field of Geographical Information System at Indian level. 10375 Citing Articles (References) are recorded. Year-wise distribution of publications and citations is given in Table 3. The highest numbers of publications 75 were published in 2019 followed by 61 in 2015 and 2018 respectively. The highest numbers of citations 1559 were received in 2017 followed by 2008 with 1166 Citations, 1052 Citations in 2013 and 1023 Citations in 2016. Double digits of publications are start from 2003 onwards and publications are gradually increased during the study period.

Table 3 shows Impact of Publications and Citations

#	Publication Impact			#	Citation Impact		
	Year	Records	TGCS		Year	Records	TGCS
1	2019	75	125	1	2017	54	1559
2	2015	61	715	2	2008	24	1166
3	2018	61	514	3	2013	44	1082
4	2016	56	1023	4	2016	56	1023
5	2017	54	1559	5	2009	29	776
6	2013	44	1082	6	2010	31	752
7	2014	42	539	7	2015	61	715
8	2012	37	631	8	2012	37	631
9	2010	31	752	9	2003	10	625
10	2009	29	776	10	2011	27	595
11	2011	27	595	11	2000	12	540
12	2020	25	21	12	2014	42	539

13	2008	24	1166	2018	61	514
14	2005	20	470	2005	20	470
15	2007	20	467	2007	20	467
16	2004	13	344	2004	13	344
17	2000	12	540	2006	12	295
18	2006	12	295	1996	5	209
19	2003	10	625	1992	1	195
20	2002	7	99	2001	3	165
21	1996	5	209	2019	75	125
22	1997	5	31	1998	5	111
23	1998	5	111	2002	7	99
24	1993	4	63	1993	4	63
25	2001	3	165	1997	5	31
26	1994	2	8	1999	2	22
27	1999	2	22	2020	25	21
28	1991	1	3	1994	2	8
29	1992	1	195	1995	1	6
30	1995	1	6	1991	1	3

Total Publications

694 Analyze

Channels Used for Communicating GIS Research

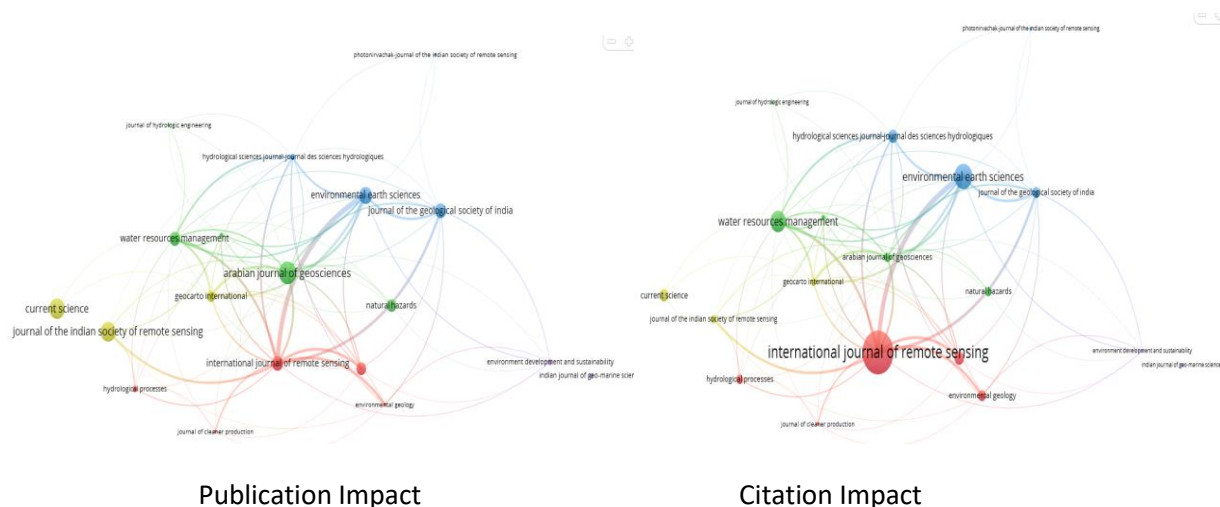
Table 4 lists the channels used for communicating of Geographical Information System research include articles published in the Journals, reviews, conference and seminars proceedings, editorial materials and book chapters. This study has observed a total of 694 publications in GIS from India. It has been observed from the table there are many communicating channels are used by scientists to publish their research articles in Indian GIS literature. The majority of publications are published in Journals i.e. 641 (92.4%), followed by Reviews 34 (4.9%) publications, 10(1.4%) of papers published in Proceedings Paper, and less than 5 Publications are published in other communication channels.

Table 4 shows Bibliographical forms wise distribution of Publications

#	Document Type	Records	%	TLCS	TGCS
1	Article	641	92.4	594	11396
2	Review	34	4.9	10	1527
3	Article; Proceedings Paper	10	1.4	3	167
4	Article; Early Access	5	0.7	0	0
5	Editorial Material	3	0.4	0	9
6	Review; Book Chapter	1	0.1	0	52

Journal wise distribution of Publications and Citations

The distribution of GIS publications were spread over 291 journals across the world. More than 33.73% of the publications are published in only 10 key-journals. Table 5 gives the leading journals each with impact factor, publications, citations, and Indexes. The highest impact factor Journal is LANCET with 59.10 followed by Living Reviews in Relativity with 23.33. Few Journals are recorded more than 2 Impact Factor (the range of Impact Factor: 2.18-59.10). A significantly large number of publications appeared in journals having impact factors 0.01 to ≤ 2.00 . The leading journals contributing to Indian research in Geographical Information System research are listed in Table 5: Arabian Journal of Geosciences with 306 publications and recorded 202 Citations, followed by Current Science with 31 Publications and received 272 Citations, Journal of the Indian Society of Remote Sensing with 30 Publications. The highest number of Citations received by LANCET with 1450 (2 Publications) followed by International Journal of Remote Sensing with 1120, Environmental and Earth Sciences with 613, Living Reviews in Relativity 542 (2 Publications) and Water Resource Management with 514 (20 Publications). 30 Journals are received more than 100 Citations.



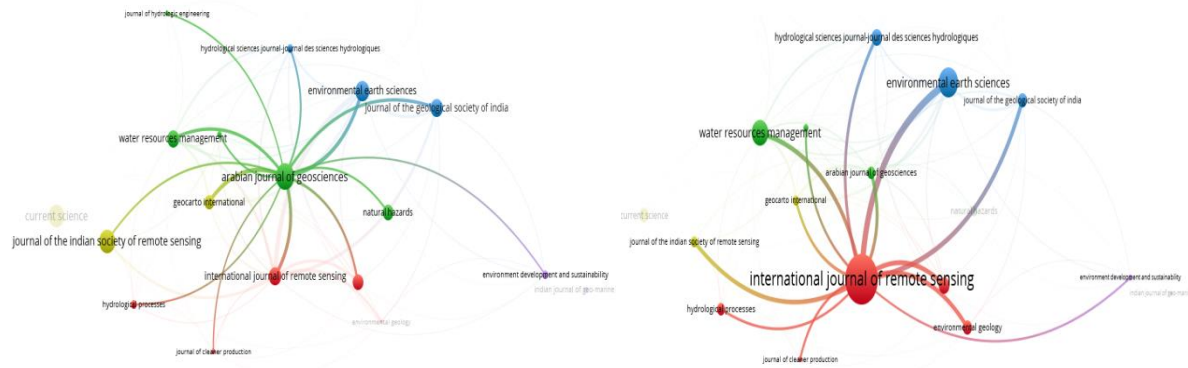


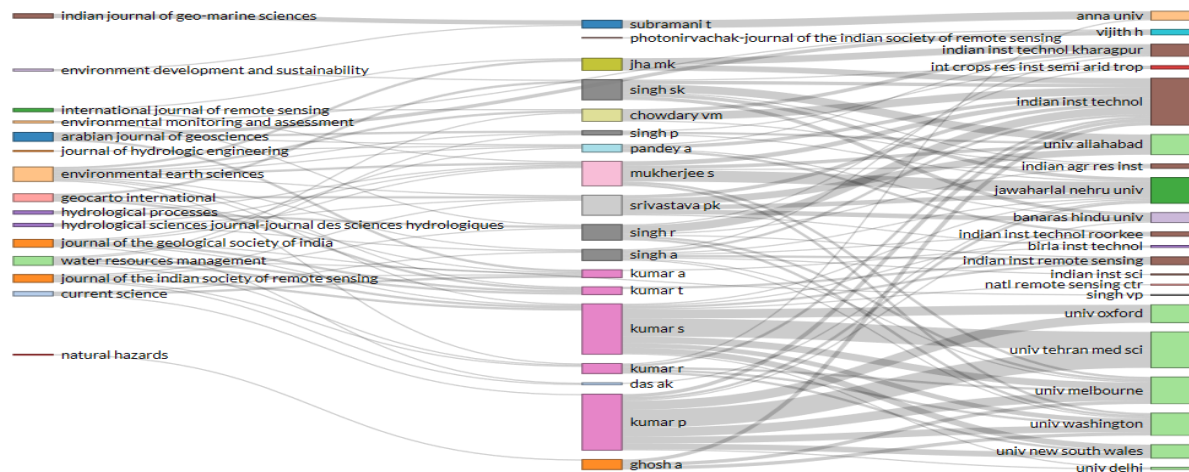
Table 5 shows Journal wise distribution of Publications and Citations

#	Journal	Records	%	TLCS	TLCS/t	TGCS	TGCS/t	TLCR
1	ARABIAN JOURNAL OF GEOSCIENCES – IF:0.91	34	4.9	19	2.46	202	30.23	63
2	CURRENT SCIENCE – IF: 0.78	31	4.5	6	0.31	272	20.89	5
3	JOURNAL OF THE INDIAN SOCIETY OF REMOTE SENSING- 0.78	30	4.3	10	1.09	176	21.64	17
4	ENVIRONMENTAL EARTH SCIENCES – 1.76	25	3.6	45	5.23	613	76.38	56
5	INTERNATIONAL JOURNAL OF REMOTE SENSING – 1.72	21	3.0	126	6.10	1120	65.90	16
6	JOURNAL OF THE GEOLOGICAL SOCIETY OF INDIA – 0.52	21	3.0	21	2.38	240	29.75	29
7	WATER RESOURCES MANAGEMENT – 3.54	20	2.9	42	5.10	514	54.84	31
8	ENVIRONMENTAL MONITORING AND ASSESSMENT – 1.96	18	2.6	22	2.56	290	32.96	15
9	NATURAL HAZARDS – 2.60	18	2.6	6	0.63	216	30.15	8
10	GEOCARTE INTERNATIONAL – 2.36	16	2.3	10	2.12	153	32.62	42
11	HYDROLOGICAL PROCESSES – 3.19	9	1.3	10	1.48	208	17.56	7
12	ENVIRONMENT DEVELOPMENT AND SUSTAINABILITY – 1.68	8	1.2	2	1.33	25	15.00	20
13	HYDROLOGICAL SCIENCES JOURNAL-JOURNAL DES SCIENCES HYDROLOGIQUES – 2.18	8	1.2	41	3.09	292	22.01	14
14	INDIAN JOURNAL OF GEO-MARINE SCIENCES – 0.30	7	1.0	2	0.33	7	1.45	0
15	JOURNAL OF EARTH SYSTEM SCIENCE – 1.10	6	0.9	18	1.69	112	10.96	10
16	PLOS ONE – 2.78	6	0.9	0	0.00	40	7.38	0
17	ENVIRONMENTAL GEOLOGY – 1.00	5	0.7	18	1.32	252	18.72	11
18	JOURNAL OF CLEANER PRODUCTION – 6.40	5	0.7	4	1.33	57	16.53	11
19	JOURNAL OF HYDROLOGIC ENGINEERING – 1.56	5	0.7	2	0.25	24	3.57	2
20	PHOTONIRVACHAK-JOURNAL OF THE INDIAN SOCIETY OF REMOTE SENSING – 0.78	5	0.7	3	0.22	30	2.08	2
21	WASTE MANAGEMENT & RESEARCH – 1.11	5	0.7	6	0.61	112	14.91	6
22	ATMOSPHERIC ENVIRONMENT – 4.01	4	0.6	4	0.33	148	12.26	0
23	EARTH SCIENCE INFORMATICS – 1.68	4	0.6	4	0.67	23	6.17	8
24	GEOMATICS NATURAL HAZARDS & RISK – 2.33	4	0.6	2	0.26	33	5.02	9
25	HYDROGEOLOGY JOURNAL – 1.72	4	0.6	34	3.38	167	18.20	18
26	IETE TECHNICAL REVIEW – 1.62	4	0.6	0	0.00	2	0.14	0
27	JOURNAL OF ENVIRONMENTAL BIOLOGY – 0.64	4	0.6	1	0.20	21	2.28	1
28	JOURNAL OF ENVIRONMENTAL MANAGEMENT – 4.17	4	0.6	3	0.41	71	10.59	3
29	MARINE POLLUTION BULLETIN – 3.78	4	0.6	5	0.79	38	6.19	4
30	PLANT GENETIC RESOURCES-CHARACTERIZATION AND UTILIZATION – 0.71	4	0.6	4	0.38	20	2.03	1

Table 6 shows Source Impact on GIS Publications

Source	h_index	g_index	m_index	TC	NP	PY_start
ARABIAN JOURNAL OF GEOSCIENCES	10	13	1.00	202	34	2011
CURRENT SCIENCE	9	15	0.30	272	31	1991
JOURNAL OF THE INDIAN SOCIETY OF REMOTE SENSING	8	11	0.47	176	30	2004
ENVIRONMENTAL EARTH SCIENCES	14	24	1.17	613	25	2009

INTERNATIONAL JOURNAL OF REMOTE SENSING	14	21	0.50	1120	21	1993
JOURNAL OF THE GEOLOGICAL SOCIETY OF INDIA	9	15	0.56	240	21	2005
WATER RESOURCES MANAGEMENT	12	20	0.57	514	20	2000
ENVIRONMENTAL MONITORING AND ASSESSMENT	9	17	0.33	290	18	1994
NATURAL HAZARDS	9	14	0.50	216	18	2003
GEOCARTO INTERNATIONAL	7	12		153	16	



Three Field Plot on GIS Publications (source, Author and Institutions)

Indexes of Authors in GIS Research

Table 7 presents the H-index, G-index and Index of Journals. The highest number of indexes of author Mukherjee S with (H-index-11, G-index-12, M-index-0.61) followed by Jha MK (H-index is 9, G-index is 10, M-index is 0.75). The study found that G-index of values is higher than H-index value of most productive Authors.

Table 7 shows Indexes of Authors in GIS Research

Author	h_index	g_index	m_index	TC	NP	PY_start
KUMAR A	7	10	0.64	105	13	2010
KUMAR S	6	13	0.32	1297	13	2002
MUKHERJEE S	11	12	0.61	942	12	2003
SINGH SK	5	11	0.50	135	11	2011
SRIVASTAVA PK	7	11	0.70	238	11	2011
JHA MK	9	10	0.75	525	10	2009
KUMAR P	6	10	0.38	1845	10	2005
SINGH R	6	10	0.35	770	10	2004
CHOWDARY VM	9	9	0.50	599	9	2003
SINGH P	3	8	0.17	91	8	2003
KUMAR R	4	7	0.21	329	7	2002
SINGH A	7	8	0.54	337	8	2008

VIJITH H	7	8	0.50	140	8	2007
KUMAR T	5	6	0.71	90	6	2014
PANDEY A	3	7	0.16	56	7	2002
ADINARAYANA J	5	6	0.19	61	6	1994

Most Productive Authors in Indian GIS Research

The table 8 shows the highly productive authors from Indian GIS research output during the study period. According to highest publications Kumar, A, occupies first rank with 13 articles (105 citations), followed by Kumar, S. published 13 papers and received 1297 citations, Mukherjee S. published 12 papers (942 citations), Singh, S.K. and Srivastava PK produced 11 papers respectively. According to highest number of Citations Gupta R recorded 2907 Citations (6 Publications), Kumar P recorded 1845 Citations (10 Publications), Tonelli M. recorded 1740 Citations (3 Publications). 726 authors are received more than 1000 Citations duo to team work. One paper is return (highly productive authors) by 1100 Authors (Abbott B, Abbott R, Abbott TD, Abernathy MR, Acernese F, et al. Prospects for observing and localizing gravitational-wave transients with Advanced LIGO, Advanced Virgo and KAGRA LIVING REVIEWS IN RELATIVITY. 2018 APR 26; 21: Art. No. 3). Four papers are written by more than 400 Authors.

Table 8 shows ranking of authors based Publications and Citations

#	Publication Impact			#	Citation Impact		
	Author	Records	TGCS		Author	Records	TGCS
1	Kumar A	13	105	1	Gupta R	6	2907
2	Kumar S	13	1297	2	Kumar P	10	1845
3	Mukherjee S	12	942	3	Tonelli M	3	1740
4	Singh SK	11	135	4	Dandona L	3	1465
5	Srivastava PK	11	238	5	Dandona R	3	1465
6	Jha MK	10	525	6	Balakrishnan K	3	1456
7	Kumar P	10	1845	7	Jha V	3	1456
8	Singh R	10	770	8	Abajobir AA	2	1450
9	Chowdary VM	9	599	9	Abate KH	2	1450
10	Singh P	9	92	10	Abbas KM	2	1450
11	Kumar R	8	553	11	Abd-Allah F	2	1450
12	Singh A	8	337	12	Abdulle AM	2	1450
13	Vijith H	8	140	13	Abera SF	2	1450
14	Kumar T	7	136	14	Aboyans V	2	1450
15	Pandey A	7	56	15	Akseer N	2	1450

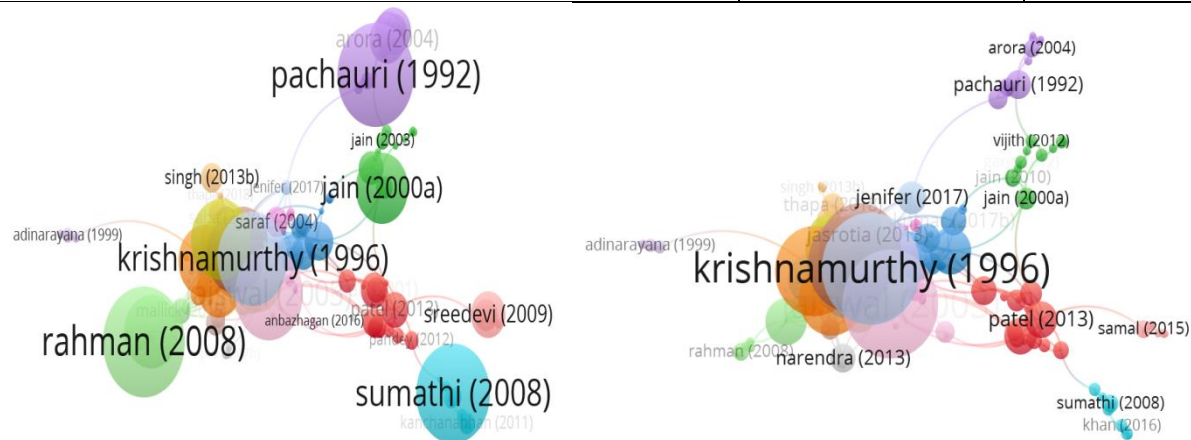
Highly cited papers

Table 9 shows that these 24 papers have recorded more than 100 Citations during 1989-2020. It was identified that 55 papers have received more than 50 Citations. The highest number of Citations recorded by Vos T et al. with 1198 Citations (Vos T, Abajobir AA, Abbafati C, Abbas KM, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016, LANCET. 2017 SEP 16; 390 (10100): 1211-1259) followed by Abbott BP et.al. with 318 Citations (Abbott BP, Abbott R, Abbott TD, Abernathy MR, Acernese F, et al. Prospects for Observing and Localizing Gravitational-Wave Transients with Advanced LIGO and Advanced Virgo LIVING REVIEWS IN RELATIVITY. 2016; 19: Art. No. 1) Kassembaum NJ et. Al. with 252 Citations (Kassebaum NJ, Barber RM, Bhutta ZA, Dandona L, Gething PW, et al. Global, regional, and national levels of maternal mortality, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015 LANCET. 2016 OCT 8; 388 (10053): 1775-1812), Jat MK et.al. with 234 Citations. The study found that most of the authors published less number of publications but recorded highest number of Citations and Average Citations Per Paper. The remaining authors of Citations, Publications and ACPP are displayed in the below table.

Table 9 shows highly Cited papers

Paper	Total Citations	TC per Year
VOS T, 2017, LANCET	1198	299.5
ABBOTT BP, 2016, LIVING REV RELATIV	318	63.6
KASSEBAUM NJ, 2016, LANCET	252	50.4
JAT MK, 2008, INT J APPL EARTH OBS	234	18
ABBOTT B, 2018, LIVING REV RELATIV	224	74.6667
RAHMAN A, 2008, APPL GEOGR	210	16.1538
PACHAURI AK, 1992, ENG GEOL	195	6.7241
SUMATHI VR, 2008, WASTE MANAGE	186	14.3077
KRISHNAMURTHY J, 1996, INT J REMOTE SENS	174	6.96
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Citation and Links

Conclusion

The analysis of Geographical Information System (GIS) has finds the publications share of India during 1989-2020, which has increased from 10 in 2003 to 75 in 2019. Scientometric studies enable the science policy makers and administrators to understand and grasp the growth, development and impact of research and to know the countries, institutions and the individual scientists who are active in a particular field of research activity. Pattern of Indian GIS scientists, citation pattern of the research output, highly productive institutions, activity profile and the impact of their research output as seen through citations as per web of science during 1989-2020. A total of 694 publications were published in GIS and these publications received 13151 citations. Indian Institutions had the highest number of collaborative publications with other countries like the USA, UK, Australia, Germany, France, China, Canada, Netherlands and Brazil. Indian GIS publications were spread over 291 journals across the world. More than 33.73% of the publications are published in only 10 key-journals and the highest impact factor Journal is LANCET with 59.10 followed by Living Reviews in Relativity with 23.33. Few

Journals are recorded more than 2 Impact Factor (the range of Impact Factor: 2.18-59.10). A significantly large number of publications appeared in journals having impact factors 0.01 to ≤ 2.00 .

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