Volume: 4 Issue: 11 Pages: 57-62

Author Productivity and Keyword Analysis of Madurai Kamaraj University: A Scientometric Study

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Article Info.
E-ISSN: 2583-6528
Impact Factor (SJIF): 6.876
Peer Reviewed Journal
Available online:
www.alladvancejournal.com

Received: 12/Oct/2025
Accepted: 14/Nov/2025

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Abstract
The study examines the author productivity and keyword trends of Madurai Kamaraj University using scientometric techniques. Data were collected from the Web of Science Core Collection for the period 2020 to 2024 using Organization Enhanced and Affiliation Enhanced search options to ensure accuracy. A total of 4616 publications were retrieved and analysed using Microsoft Excel and Biblioshiny software. The analysis focuses on identifying the most relevant authors, locally cited authors, authors' production over time, and their local impact. Additionally, the study explores the most frequent keywords and their usage trends over time. The results highlight the growth of research productivity, key contributors, and emerging research areas within the university. The study provides valuable insights into the publication performance and intellectual structure of Madurai Kamaraj University, helping researchers and policymakers understand its scientific impact and research development patterns.

Keywords: Research productivity; Madurai Kamaraj University, Author Productivity, Keyword Analysis Scientometric Study.

Introduction

The study focuses on analyzing the research output of Madurai Kamaraj University from 2020 to 2024 using scientometric techniques. It aims to identify the most relevant authors; most locally cited authors, authors' production over time, and authors' local impact. It also examines the most frequent keywords and the frequency of keywords over time. Data were collected from the Web of Science database and analyzed using Excel and Biblioshiny tools. The study highlights the productivity and research trends of the university through author and keyword analysis, providing a clear picture of the institution's research contributions during the study period.

Scientometric analysis is an effective method used to evaluate the growth, productivity, and impact of research output. It helps in identifying active authors, research trends, and the evolution of key themes over time. By applying scientometric tools, this study provides a comprehensive view of Madurai Kamaraj University's research performance, author contributions, and keyword trends during the years 2020 to 2024.

Review of Literature

Borsi *et al.* (2025) proposed and validated a systematic manual and algorithmic Keyword Standardization and Restructuring (KSR) procedure to address noise and bias in co-word analyses for science mapping. Using a network of over 5,000 innovation management articles, they demonstrated that implementing the KSR procedure significantly improves the quality and interpretability of bibliometric networks and their clusterings. The study provides recommendations to help researchers build more representative keyword-based science maps.

Gayathri and Srinivasaragavan (2024) performed a scientometric analysis of Bharathidasan University's research output using Web of Science's subject classification (Macro, Meso, Micro). The study found that the university contributes across all 10 Macro and 2500 Micro topics. Focusing on the top 20 areas, they determined that India ranks highly, achieving 6th globally in two categories and 4th among Asian nations in the top five subject areas. The study utilized VOSviewer and Histcite to correlate research trends at national and global levels.

Anandhi and Sarangapani (2021) analyzed 428 cancer research publications from M.K. University via Web of Science (2010–2020), utilizing Bibliometrix, bibexcel, and VOSviewer. The study assessed growth, author productivity, and collaboration. Key findings indicated high authorship collaboration (DC mean 0.99). It was observed that the authorship pattern was inversely proportional to citation count. Preferred journals included *RSC Advances*. The authors advised researchers to prioritize quality and novelty alongside collaborative efforts.

Profile of Madurai Kamaraj University

NAAC A++ accredited Madurai Kamaraj University, established in 1966, is a State University recognized for excellence in teaching, research, and outreach. With 20 schools and 77 departments, it offers a wide range of academic programs and hosts over 4,650 students and scholars. The university has received major research funding from UGC, DST, CSIR, and other national agencies, fostering strong research productivity and innovation

Objectives

1. To identify the most relevant authors of Madurai Kamaraj University.
2. To analyze the most locally cited authors in the university's research output.
3. To examine the authors' production over time.
4. To evaluate the local impact of authors based on citations.
5. To identify the most frequent keywords used in publications.
6. To study the frequency and trend of keywords over time.

Methodology

The study adopts scientometric methods to analyse the author productivity and keyword trends of Madurai Kamaraj University from 2020 to 2024. Data were retrieved from the Web of Science Core Collection using the Organization Enhanced and Affiliation Enhanced search options. A total of 4616 records were exported in plain text and analysed using Microsoft Excel and Biblioshiny tools.

Data Analysis and Interpretations

Most Relevant Authors and Publication Contributions

Table 1 shows the top ten most productive authors of Madurai Kamaraj University. Natarajan S and Perumal S lead with 178 publications each, contributing 49.37% and 45.17% respectively. Muthusubramanian S follows with 172 papers (48.73%), while Dhakshinamoorthy A and Gunasekaran P produced 155 (42.08%) and 141 (39.40%). Pitchumani K achieved the highest fractionalized share of 51.12%.

Table 1: Most Relevant Authors

S. No.	Authors	No of Publications	(%)
1	Natarajan S	178	49.37
2	Perumal S	178	45.17
3	Muthusubramanian S	172	48.73
4	Dhakshinamoorthy A	155	42.08
5	Gunasekaran P	141	39.40
6	Pitchumani K	134	51.12
7	Ramakrishnan V	130	37.90
8	Kumar G G	116	23.79
9	Ramaraj R	112	42.75
10	Rajan M	104	21.03

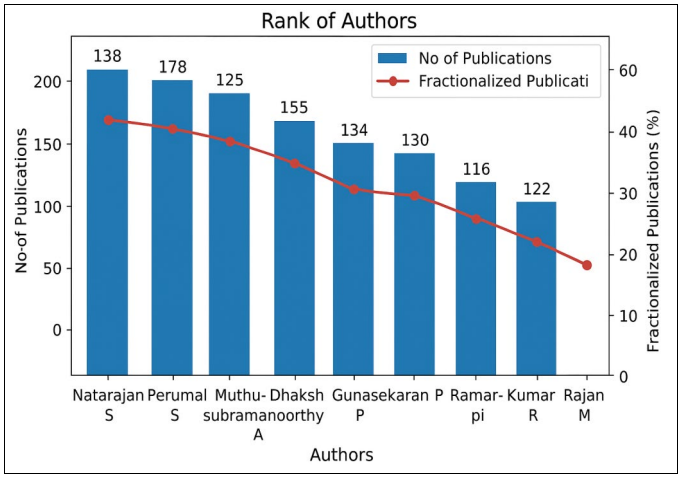

Fig 1: Most Relevant Authors

Most Locally Cited Authors

Table 2 shows the most locally cited authors from Madurai Kamaraj University. Perumal S ranks first with 873 citations, followed by Dhakshinamoorthy A with 488 and Pitchumani K with 462 citations. Rajagopal S and Ramaraj R have 440 and 385 citations, respectively. Natarajan S (327) and Muthusubramanian S (325) also made significant contributions to the research productivity.

Table 2: Most Locally Cited Authors

S. No.	Author	Local Citations
1	Perumal S	873
2	Dhakshinamoorthy A	488
3	Pitchumani K	462
4	Rajagopal S	440
5	Ramaraj R	385
6	Natarajan S	327
7	Muthusubramanian S	325
8	Kumar G G	324
9	Kumar R R	293
10	Garcia H	271

Authors' Production Over Time

Table 3 presents the top authors of Madurai Kamaraj University based on total publications and citation impact. Dhakshinamoorthy A leads with 155 publications, 11,608 citations, and an average of 88.12 citations per year. He is followed by Kumar G G (116 publications, 6,245 citations) and Pitchumani K (134 publications, 4,869 citations), showing strong research visibility and influence.

Table 3: Authors' Production Over Time

S. No.	Author	Total Publications	Total Citations	Average Citations per Year
1	Dhakshinamoorthy A	155	11,608	88.12
2	Kumar G G	116	6,245	52.63
3	Pitchumani K	134	4,869	16.82
4	Perumal S	178	4,734	14.09
5	Ramaraj R	112	4,130	13.73
6	Gunasekaran P	141	3,872	11.89
7	Ramakrishnan V	130	3,072	9.43
8	Rajan M	104	2,643	42.06
9	Natarajan S	178	2,322	7.24
10	Muthusubramanian S	172	2,162	7.62

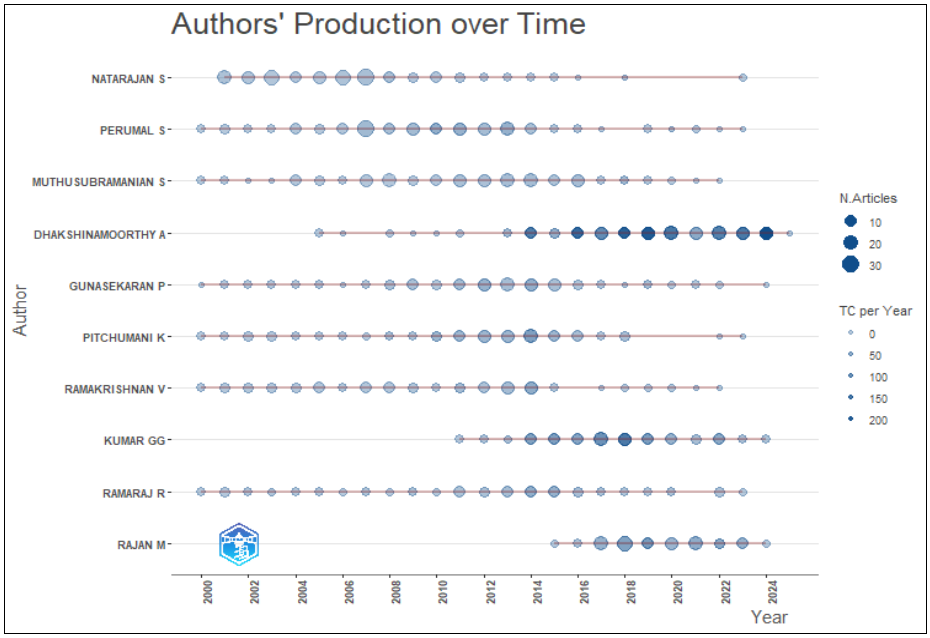

Fig 2: Authors' Production Over Time

Authors' Local Impact

Table 4 presents the authors' local impact based on h-index, g-index, and m-index values. Dhakshinamoorthy A ranks first with an h-index of 48, g-index of 105, and m-index of 2.286, followed by Kumar G G (h-index 47, g-index 76) and Pitchumani K (h-index 42, g-index 63), indicating strong productivity and consistent research influence.

Table 4: Authors' Local Impact Three-field plot

S. No.	Author	h index	g index	m index	TC	NP
1	Dhakshinamoorthy A	48	105	2.286	11608	155
2	Kumar G G	47	76	3.133	6245	116
3	Pitchumani K	42	63	1.615	4869	134
4	Perumal S	38	62	1.462	4734	178
5	Ramaraj R	38	60	1.462	4130	112
6	Gunasekaran P	35	55	1.346	3872	141
7	Rajagopal S	32	53	1.231	3319	103
8	Saraswathi R	30	52	1.2	2801	67
9	Rajan M	29	45	2.636	2643	104
10	Ramakrishnan V	29	49	1.115	3072	130

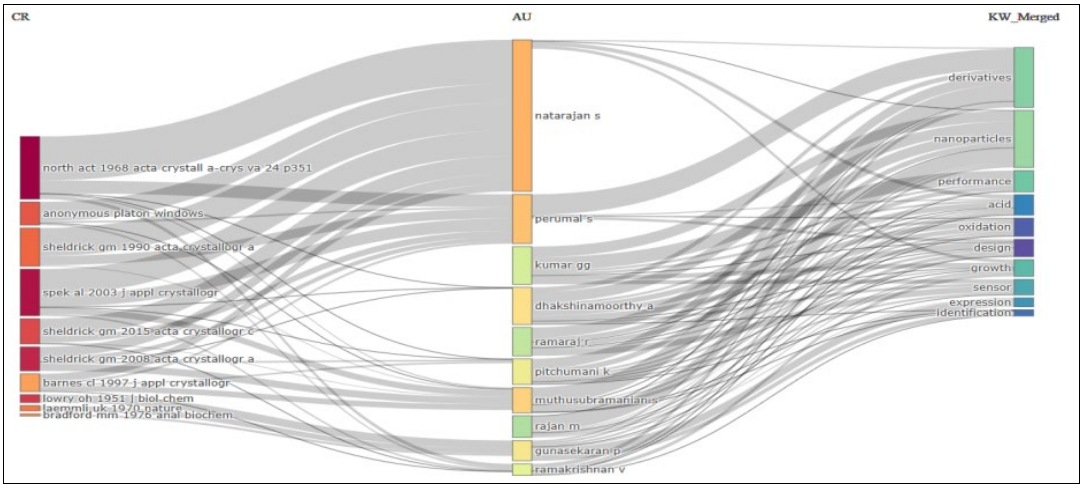

Fig 3: Authors' Local Impact Three-field plot

Most Frequent Keywords

Table 5 shows the most frequent keywords in Madurai Kamaraj University's research publications. "Nanoparticles" ranks first with 303 occurrences, followed by "Na" (267) and "Derivatives" (233). Other recurring terms like "Performance" (180) and "Growth" (172) highlight the university's strong research focus on nanotechnology, material science, and chemical synthesis.

Table 5: Most Frequent Keywords

Table 5: Most Frequent Keywords

S. No.	Keywords	Frequency
1	Nanoparticles	303
2	Na	267
3	Derivatives	233
4	Performance	180
5	Growth	172
6	Sensor	147
7	Expression	142
8	Acid	127
9	Identification	118
10	Oxidation	114
11	Design	113
12	Crystal-Structure	110
13	Water	106
14	Complexes	101
15	Gold Nanoparticles	100

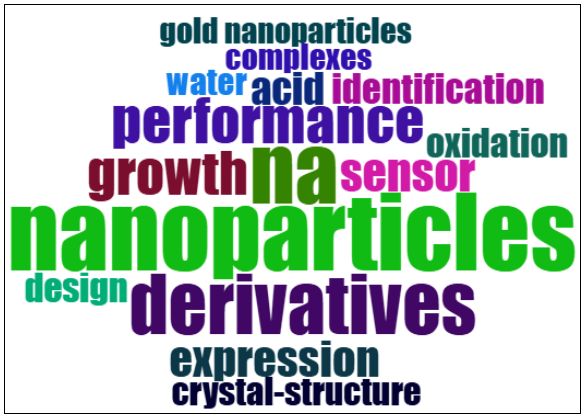

Fig 4: Most Frequent Keywords

Keywords' Frequency Over Time

Table 6 shows the keyword frequency trend from 2000 to 2024. "Nanoparticles" increased from 1 in 2000 to 297 in 2024, followed by "Na" (266) and "Derivatives" (230), showing steady growth in nanomaterial research. Similarly, "Sensor" rose from 0 to 143, and "Expression" from 3 to 141, indicating expanding research in analytical and biological applications at Madurai Kamaraj University.

Table 6: Keywords' Frequency over Time

Year	Nano particles	Na	Derivatives	Performance	Growth
2000	1	5	0	0	0
2001	1	21	1	0	1
2002	1	35	3	0	3
2003	1	52	6	0	5
2004	1	64	8	0	6
2005	3	78	11	1	9
2006	4	93	15	1	13
2007	5	113	21	1	17
2008	9	126	26	1	20
2009	12	139	31	1	23
2010	14	157	41	4	26
2011	21	173	56	8	33
2012	29	185	77	10	42
2013	38	188	101	12	45
2014	51	194	119	15	54
2015	67	201	133	27	66
2016	89	208	149	41	78
2017	117	218	163	50	103
2018	150	224	182	69	116
2019	182	227	194	86	125
2020	205	232	201	103	139
2021	222	244	209	108	150
2022	248	251	216	136	159
2023	272	258	222	157	164
2024	297	266	230	177	171

Year	Sensor	Expression	Acid	Identification	Oxidation
2000	0	3	1	0	0
2001	0	7	5	1	2
2002	1	10	8	2	5
2003	1	12	8	6	7
2004	1	15	11	8	9
2005	1	18	19	12	11
2006	3	19	20	13	16
2007	5	21	25	16	18
2008	5	26	25	17	21
2009	6	29	27	22	27
2010	6	37	31	25	29
2011	9	43	34	32	39
2012	14	49	39	37	43
2013	19	56	42	46	49
2014	29	66	46	54	56
2015	36	73	56	61	63
2016	52	81	58	68	69
2017	63	92	70	74	72
2018	76	96	81	82	81
2019	86	102	92	92	85
2020	99	112	102	98	93
2021	109	121	106	102	98
2022	123	131	113	105	103
2023	135	137	120	109	106
2024	143	141	125	115	114

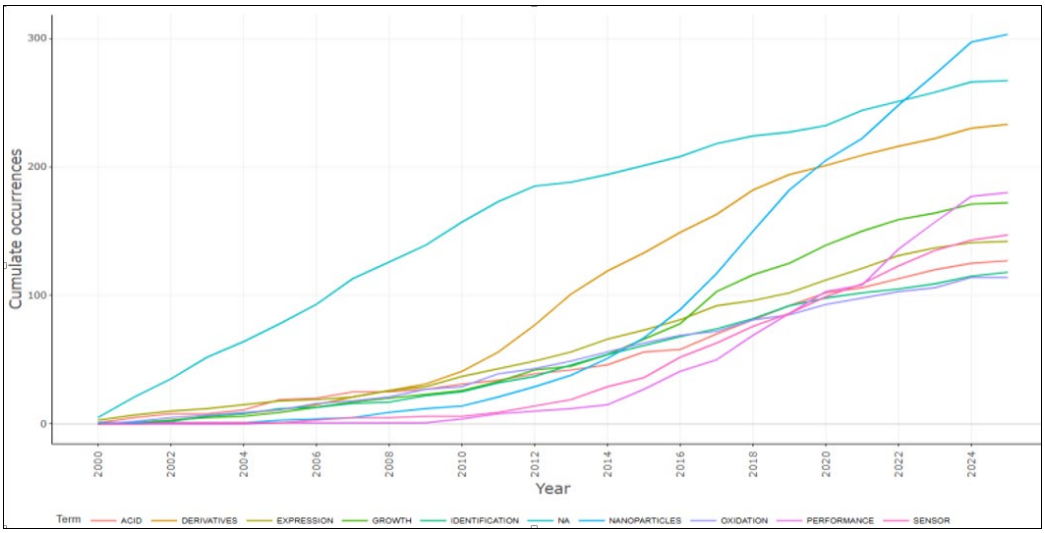

Fig 5: Keywords' Frequency Over Time

Findings

The findings reveal that Madurai Kamaraj University demonstrates strong research productivity and influence across various scientific domains. Natarajan S and Perumal S are the most productive authors with 178 publications each, while Perumal S leads in local citations with 873. Dhakshinamoorthy A stands out for overall research impact, having 11,608 citations and the highest h-index (48) and g-index (105). Keyword analysis shows "Nanoparticles" (303) as the most frequent term, followed by "Na" (267) and "Derivatives" (233). The keyword growth trend from 2000 to 2024 highlights increasing research in nanotechnology and sensor development. Overall, the university's scholars exhibit consistent productivity, citation influence, and a progressive shift toward nanomaterials and interdisciplinary scientific research.

Suggestions and Conclusion

The study suggests that Madurai Kamaraj University can further enhance research productivity by encouraging interdisciplinary collaborations and increasing international research partnerships. More focus on high-impact publications and citation visibility will strengthen the university's global research profile. Additionally, organizing workshops on emerging research areas like nanotechnology and sensor development will sustain scholarly growth.

In conclusion, the scientometric analysis highlights the university's strong contribution to scientific research, particularly in nanomaterials and chemical sciences. The consistent increase in publications and citations reflects the university's growing research excellence and its vital role in advancing knowledge and innovation in higher education.

Reference

1. Anandraj KC, Aravind S. Author Productivity and the Application of Lotka's Law in Indian Metal-organic Framework Research Publications. *Asian Research Journal of Current Science*. 2025; 7(1):397-407.
2. Akbar F, Arif M, Rafiq M. Mapping the research productivity of Pakistan Agricultural Research Council: a

scientometric study. *Global Knowledge, Memory and Communication*. 2025; 74(7-8):2238-2254.
3. Chakra R. Social Responsibility in Universities: Bibliometric and Literature Review. *Educational Process: International Journal*. 2025; 16:e2025192.
4. Sakthivel Gayathri, S. Srinivasaragavan. "Measuring Scholarly Traits of a University A Scientometric Study of the Scholarly Publications of the Bharathidasan University." *DESIDOC Journal of Library & Information Technology*. 44 4(2024): 212.
5. Padma P. Growth of Science Research and Its Reflections on Academic Performance at the University of Kerala. *DESIDOC Journal of Library & Information Technology*. 2024; 44(6).
6. Anandhi C, Sarangapani R. Research Patterns and Citations in the Cancer Research Output of Madurai Kamaraj University, 2021.
7. Sarangapani R. A Scientometrics Analysis of World Vertigo Research Output with the reference of Web of science in 2001-2017. *Library Philosophy and Practice*, 2020, 1-16.
8. Nidhisha PK, Sarangapani R. Research Productivity of National Institute of Technology, Calicut: A Scientometric Study. *ICRLIT–2019: e-Proceedings*, 2019, 745-754.
9. https://mkuniversity.ac.in/new/
10. https://link.springer.com/journal/11192