

bibliometric indicators such as the h-index, CiteScore, SCImago Journal Rank (SJR), and Source Normalised Impact per Paper (SNIP). The database also features a patent repository. Scholars and academic institutions frequently utilise Scopus for literature review, research evaluation, and monitoring global academic trends.

1.3 Scope of the Study

This study examines the research output of Assam University. Data on the university's scholarly publications were extracted from the Scopus database using defined filters. The analysis covers the period from 1994 to 2025.

1.4 Objective

1. To determine the annual growth pattern of research publications at Assam University.
2. To calculate the Annual Growth Rate (AGR), Relative Growth Rate (RGR), Doubling Time (DT), and Degree of Collaboration (DC).
3. To identify the top 20 most prolific authors by publication count and the journals most frequently selected by Assam University researchers.
4. To visualise keyword occurrences and international research collaborations using VOS viewer.
5. To find out the top 20 most preferred journals, affiliations, and subject areas

2 Literature Review

The paper "Research Output of Dibrugarh University" contains a thorough scientometric analysis of Scopus data for the period 1982-2020. It indicates a significant increase in publications after 2000, the period during which journal articles predominate as the output. It also turns out that the work shows a high level of national cooperation and a high number of prolific authors, as indicated by indicators such as the Annual Growth Rate and h-index¹. The paper examines IIT Kharagpur's research performance over the past three years using scientometric methods. It also measures the department's performance using SCI-indexed publications, impact factor, high-quality papers, and the Publication Effectiveness Index (PEI)¹⁵. As the results show, departments like Physics and Chemistry have the greatest impact and research quality, and the patterns of collaboration vary by field⁸. The paper analyses trends in international research in the field of Scientometrics, based on Scopus and Web of Science data, during 1999-2018. It shows a steady rise in publications, growing international collaboration, and

the overwhelming dominance of journal articles as the primary form of communication. The paper also highlights the major nations, organisations, and popular writers in the area¹². This paper provides a scientometric review of DCRUST's research productivity (2011-2021) based on Scopus data. It successfully applies tools such as Bibliometrix and VOSviewer to examine trends in publications, patterns of authorship and collaboration, and citation impact. The work has indicated a steady increase in publications, effective cooperation, and the prevalence of engineering research¹³. The paper evaluates IIT Delhi's research output during 1964-2010 using the Scopus database. It shows a significant increase in output to 15,476 publications, with engineering as the major field. Analysis of citations has demonstrated that chemistry is the most influential field, with a moderate average citation rate. The research also finds that collaboration is rising, although there are fewer international associations than national ones¹⁶.

3 Methodology

The study adopts a quantitative scientometric approach in analysing the research productivity and collaboration patterns of Assam University, Silchar, during the period (1994-2025). The data has been retrieved on 21 March 2026 from the Scopus database using an affiliation-based search strategy. The advanced search query was (AF-ID (60018003) OR AF-ID (60079442) AND (EXCLUDE (PUBYEAR, 2026))) AFFIL ("Assam University" AND "Silchar"), and the results were filtered by the years of publication (1994-2025) and types of documents, including articles, conference papers, reviews, and book chapters. The retrieved records were exported in CSV format, including bibliographic information such as authors, titles, affiliations, citations, and keywords, and data cleaning was performed to eliminate duplications and inconsistencies. The majority of the uncleaned data were tabulated and statistically analysed on Microsoft Excel, Flourish, and VOSviewer.

4 Scientometric Indicators

Several scientometric indicators have been used to analyse the data retrieved from the Scopus Database.

4.1 Annual Growth Rate

Annual Growth Rate is a mathematical formula proposed by Kumar and Kaliyaperumal¹⁴ in 2015 to calculate the percentage increase in value between

two years, such as the current and previous year, thereby measuring the rate of change.

$$AGR = \frac{End\ Value - First\ Value}{First\ Value} \times 100$$

4.2 Relative Growth Rate

Relative growth rate is the increase in the number of publications per unit time. The formula developed by¹⁰.

$$RGR = (1 - 2^{\frac{LnW2 - LnW1}{T2 - T1}}) \times 100$$

where,

R = Relative Growth Rate over the specific period of intervals

W1= Log W1 (Total Number of Publications at Initial time)

W2= Log W2 (Total Number of Publications at Final).

T2 - T1= Difference between the initial year and the final year. The year can be taken here as the unit of time.

4.3 Doubling Time

The doubling time is the given period required for the quantity to double in size or value. This formula can be calculated using the formula given by¹⁰.

$$DT = \frac{D(t)0.693}{RGR}$$

4.4 Degree of Collaboration

The Degree of collaboration is used for the authorship pattern⁷.

$$DC = \frac{NM}{(NS + NM)}$$

where,

DC = Degree of Collaboration

Nm = Number of multi-authored papers

Ns = Number of single-authored papers

5 Analysis and Discussions

5.1 Year-Wise Distribution of Publication

Table 1 shows the year-wise growth of publications and citations during 1994-2025 at Assam University. The graphical representation is shown in Figure 1. In the initial years from 1994-2000, the research output was very low, with publications ranging from 0 to 8, accounting for only 0.6% of the total output. During the period (2001-2010), there was a gradual increase in both publications and citations, with publications ranging from 5 to 93 and citations improving significantly. The period from 2011-2020 shows rapid growth in both publications and citations, increasing

Table 1 — Year-wise growth of Publications and Citations during 1994-2025

Year	Publication	% of TP (4869)	Citation	% of TC (73394)	AGR
1994	1	0.02%	0	0.00%	0
1995	0	0.00%	0	0.00%	-100
1996	5	0.10%	8	0.01%	100
1997	2	0.04%	37	0.05%	-60
1998	8	0.16%	173	0.24%	75
1999	8	0.16%	115	0.16%	0
2000	5	0.10%	38	0.05%	-37.5
2001	6	0.12%	156	0.21%	20
2002	15	0.31%	442	0.60%	150
2003	13	0.27%	425	0.58%	-13.33
2004	16	0.33%	500	0.68%	23.07
2005	11	0.23%	916	1.25%	-31.25
2006	18	0.37%	455	0.62%	63.63
2007	24	0.49%	569	0.78%	33.33
2008	31	0.64%	1117	1.52%	29.16
2009	48	0.99%	1240	1.69%	54.83
2010	93	1.91%	1949	2.66%	97.87
2011	116	2.38%	2763	3.76%	24.73
2012	149	3.06%	3481	4.74%	28.44
2013	179	3.68%	3609	4.92%	20.13
2014	244	5.01%	4041	5.51%	36.31
2015	225	4.62%	4242	5.78%	-7.78
2016	251	5.16%	5945	8.10%	11.55
2017	255	5.24%	4444	6.05%	1.59
2018	275	5.65%	5605	7.64%	8.26
2019	301	6.18%	5392	7.35%	9.45
2020	363	7.46%	6028	8.21%	20.59
2021	389	7.99%	7869	10.72%	7.16
2022	418	8.58%	5254	7.16%	7.17
2023	421	8.65%	3403	4.64%	0.71
2024	443	9.10%	2398	3.27%	5.22
2025	536	11.01%	780	1.06%	20.99
Total	4869	100.00%	73394	100.00%	Average AGR. 18.72

from 116 to 363 and from 1949 to 6028, respectively, accounting for 48.42% of the total publications. In the recent period (2021-2025), research output reached its highest level, peaking at 536 (11.01%) in 2025. However, citations show a declining trend from 7869 in 2021 to 780 in 2025; this decline is not necessarily negative and reflects the citation time lag. Overall, the average AGR of 18.72% indicates steady and substantial growth in research productivity over the years.

5.2 Relative Growth Rate (RGR) and Doubling Time (DT)

Table 2 presents the RGR and DT for publications from 1994 to 2025, along with the cumulative index.

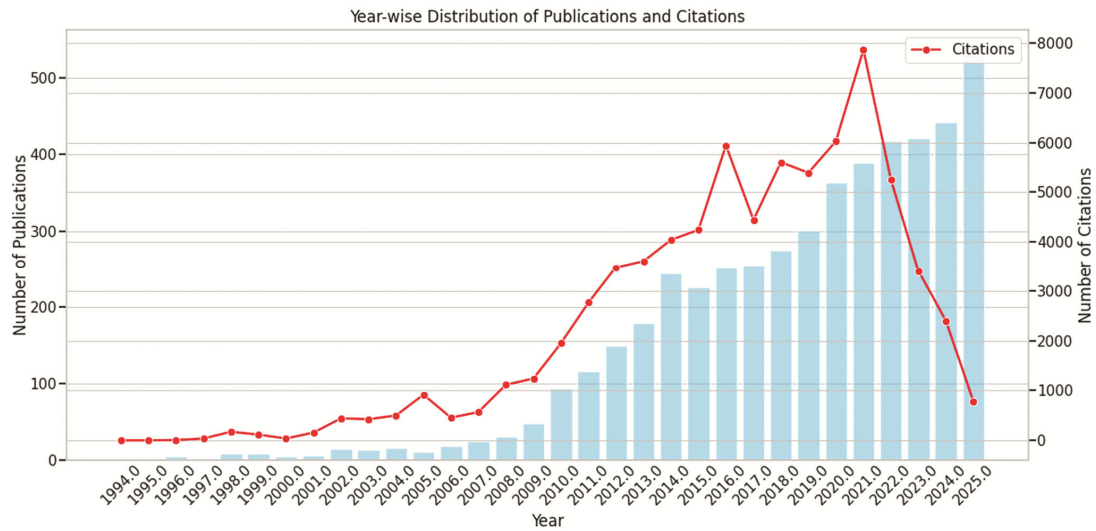


Fig. 1 — Graphical representation of Year-wise growth of Publications and Citations during 1994-2025

Table 2 — Relative Growth Rate (RGR) and Doubling Time (DT) of publications

Year	Publications	CI	W1	W2	RGR	DT
1994	1	1	--	--	-	-
1995	0	1	--	0.00	0.00	0
1996	5	6	0.00	1.79	1.79	0.39
1997	2	8	1.79	2.08	0.29	2.41
1998	8	16	2.08	2.77	0.69	1.00
1999	8	24	2.77	3.18	0.41	1.71
2000	5	29	3.18	3.37	0.19	3.66
2001	6	35	3.37	3.56	0.19	3.69
2002	15	50	3.56	3.91	0.36	1.94
2003	13	63	3.91	4.14	0.23	3.00
2004	16	79	4.14	4.37	0.23	3.06
2005	11	90	4.37	4.50	0.13	5.32
2006	18	108	4.50	4.68	0.18	3.80
2007	24	132	4.68	4.88	0.20	3.45
2008	31	163	4.88	5.09	0.21	3.29
2009	48	211	5.09	5.35	0.26	2.68
2010	93	304	5.35	5.72	0.37	1.90
2011	116	420	5.72	6.04	0.32	2.14
2012	149	569	6.04	6.34	0.30	2.28
2013	179	748	6.34	6.62	0.27	2.53
2014	244	992	6.62	6.90	0.28	2.45
2015	225	1217	6.90	7.10	0.20	3.39
2016	251	1468	7.10	7.29	0.19	3.70
2017	255	1723	7.29	7.45	0.16	4.33
2018	275	1998	7.45	7.60	0.15	4.68
2019	301	2299	7.60	7.74	0.14	4.94
2020	363	2662	7.74	7.89	0.15	4.73
2021	389	3051	7.89	8.02	0.14	5.08

(Contd.)

Table 2 — Relative Growth Rate (RGR) and Doubling Time (DT) of publications (Contd.)

Year	Publications	CI	W1	W2	RGR	DT
2023	421	3890	8.15	8.27	0.11	6.05
2024	443	4333	8.27	8.37	0.11	6.43
2025	536	4869	8.37	8.49	0.12	5.94
Total	4869	--	--	--	Average RGR — 0.27	Average DT — 3.39

The graphical representation is shown in Figure 2. The CI shows a steady growth in total publications. The Natural logarithm values also increase gradually, reflecting exponential growth. The RGR is high at the beginning, as the table shows 1.79 in 1996, indicating rapid growth from a small base, but it gradually declines over time, ranging from 0.11 to 0.15 in recent years (2021-2025).

5.3 Degree of Collaboration

Table 3 indicates the degree of collaboration among authors. The graphical representation is shown in Figure 3. In the initial years (1994-2000), almost all publications were collaborative, and only 3 publications were single-authored, with DC equal to 1. This indicates that the number of publications during this period was very low. During the period 2001-2010, the number of publications increased steadily, and a small number of single-authored papers began to appear. Despite this, collaborative research continued to dominate, with DC values mostly above 0.90. This shows that even as research

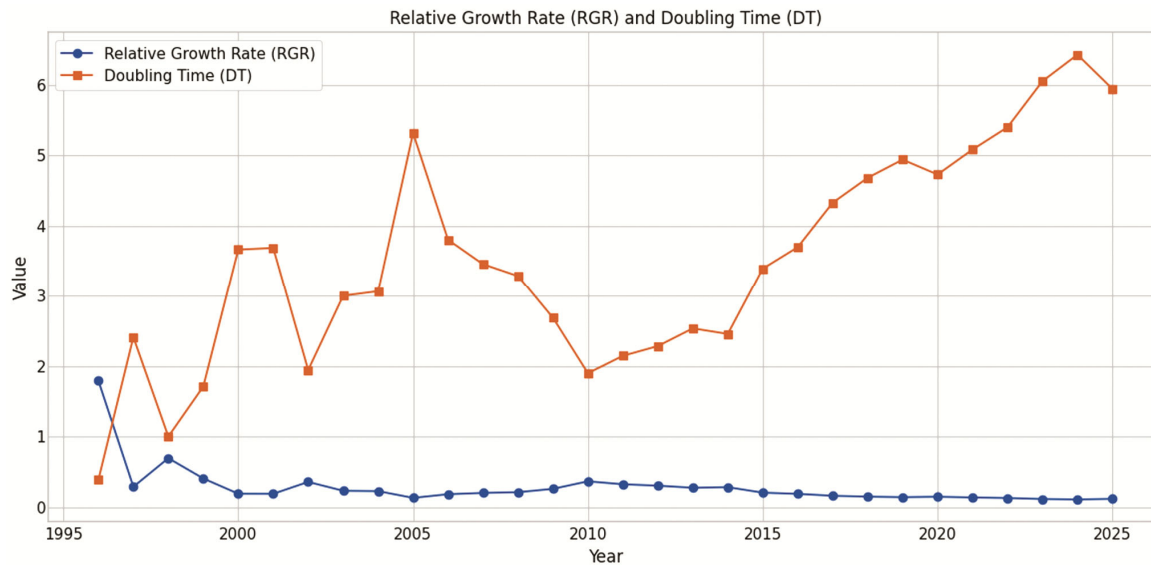


Fig. 2 — Graphical representation of Relative Growth Rate (RGR) and Doubling Time (DT) of publications *Degree of Collaboration*

Table 3 — Degree of Collaboration among authors

Year	Single-authored paper (N_N)	Multiple-authored paper (N_M)	N_M+N_S	Degree of Collaboration (DC) N_M+N_S/N_M
1994	--	1	1	1
1995	0	0	0	--
1996	0	5	5	1
1997	0	2	2	1
1998	2	6	8	0.75
1999	1	7	8	0.88
2000	0	5	5	1
2001	0	6	6	1
2002	0	15	15	1
2003	1	12	13	0.92
2004	1	15	16	0.94
2005	1	10	11	0.91
2006	1	17	18	0.94
2007	3	21	24	0.88
2008	3	28	31	0.90
2009	2	46	48	0.96
2010	9	84	93	0.90
2011	13	103	116	0.89
2012	13	136	149	0.91
2013	5	174	179	0.97
2014	17	227	244	0.93
2015	15	210	225	0.93
2016	9	242	251	0.96
2017	16	239	255	0.94
2018	11	264	275	0.96

(Contd.)

Table 3 — Degree of Collaboration among authors (Contd.)

Year	Single-authored paper (N_N)	Multiple-authored paper (N_M)	N_M+N_S	Degree of Collaboration (DC) N_M+N_S/N_M
2019	13	288	301	0.96
2020	19	344	363	0.95
2021	12	377	389	0.97
2022	17	401	418	0.96
2023	15	406	421	0.96
2024	21	422	443	0.95
2025	24	512	536	0.96
Total	244	4625	4869	0.95

output expanded, the researchers preferred teamwork and co-authorship.

5.4 Top 20 Most Preferred Journals

Table 4 presents the top 20 most preferred publication sources for Assam University researchers, along with their impact indicators. The data is categorised into national and international sources to show diverse dissemination. The source with the highest number of publications is Communication in Computer and Information Science, with 46 (0.94%), followed by Current Science with 45 (0.92%) and Liquid Crystals with 38 (0.78%). Other major sources include Lecture Notes in Networks and Systems with 33 (0.68%), Advances in Intelligent Systems and Computing with 32 (0.66%), and AIP Conference Proceedings with 29 (0.60%).

*TP = Total Publication

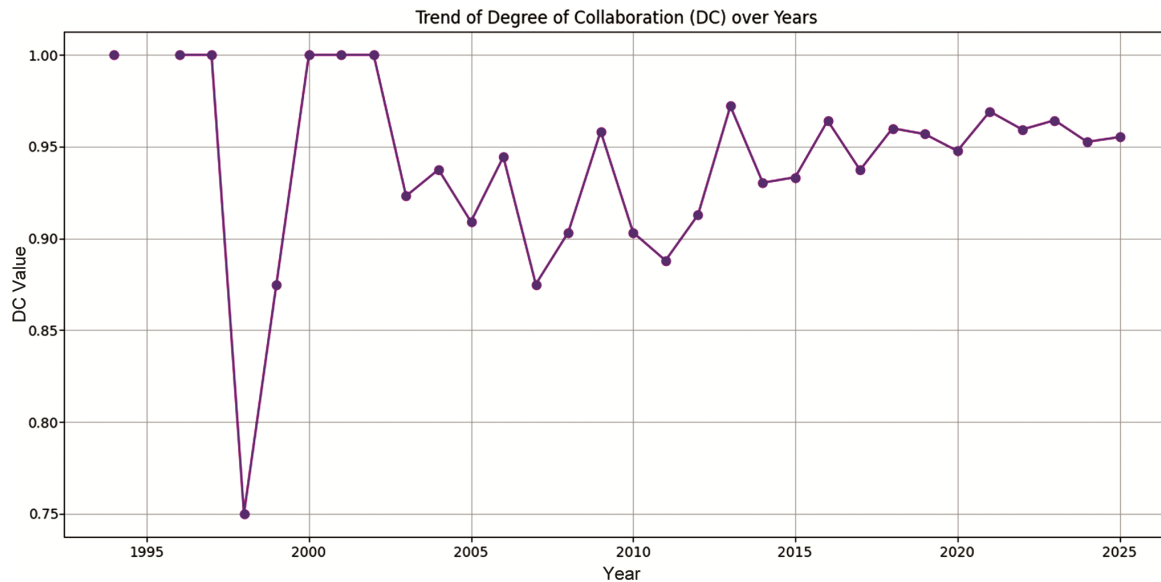


Fig. 3 — Graphical representation of the degree of collaboration among authors *Top 20 Most Preferred Journals*

Table 4 — Top 20 most preferred Journals

Source Name	Country	TP	% of 4869	h-index	Cite Score	SJR	SNIP
Communications in Computer and Information Science	Germany	46	0.94%	75	1.1	0.182	0.242
Current Science	India	45	0.92%	144	1.5	0.231	0.536
Liquid Crystals	UK	38	0.78%	85	4.3	0.425	0.779
Lecture Notes in Networks and Systems	Switzerland	33	0.68%	48	1	0.166	0.233
Advances in Intelligent Systems and Computing	Germany	32	0.66%	81	0.9	0.215	0.298
AIP Conference Proceedings	US	29	0.60%	90	0.5	0.153	0.204
Environmental Science and Pollution Research	Germany	29	0.60%	212	10.6	1.004	1.084
Journal of Molecular Structure	Netherlands	28	0.58%	134	8	0.628	0.999
RSC Advances	UK	28	0.58%	230	7.6	0.777	0.964
Indian Journal of Medical Microbiology	India	27	0.55%	59	2.4	0.366	0.501
Indian Journal of Traditional Knowledge	India	27	0.55%	45	1.6	0.269	0.716
Journal of Pure and Applied Microbiology	India	26	0.53%	31	1.6	0.236	0.288
Lecture Notes in Electrical Engineering	Germany	25	0.51%	49	0.7	0.143	0.128
Scientific Reports	UK	25	0.51%	347	6.7	0.874	1.213
PLOS One	US	24	0.49%	467	5.4	0.803	1.065
Journal of Threatened Taxa	India	23	0.47%	17	1	0.262	0.508
International Journal of Pharmacy and Pharmaceutical Sciences	India	22	0.45%	62	1.2	0.165	0
Monthly Notices of the Royal Astronomical Society	UK	22	0.45%	391	9.7	1.702	1.188
Gene	Netherlands	20	0.41%	200	5.1	0.682	0.716
Journal of Environmental Biology	India	20	0.41%	63	1.7	0.245	0.475

5.5 Type of Published Document

Figure 4 shows the distribution of publications across different document types, clearly indicating that journal articles dominate, accounting for 68.19% (3320) and making them the primary mode of scholarly communication. Book chapters follow with 11.56% (563), and Conference papers with 8.44% (411), dazzling contributions to edited volumes and

academic conferences. Review papers, at 7.89% (384), also account for a major share, representing a scholarly synthesis of research.

5.6 Top 20 Subject Area

Figure 5 shows the distribution of publications from Assam University by subject, indicating that the university has a high profile in multidisciplinary

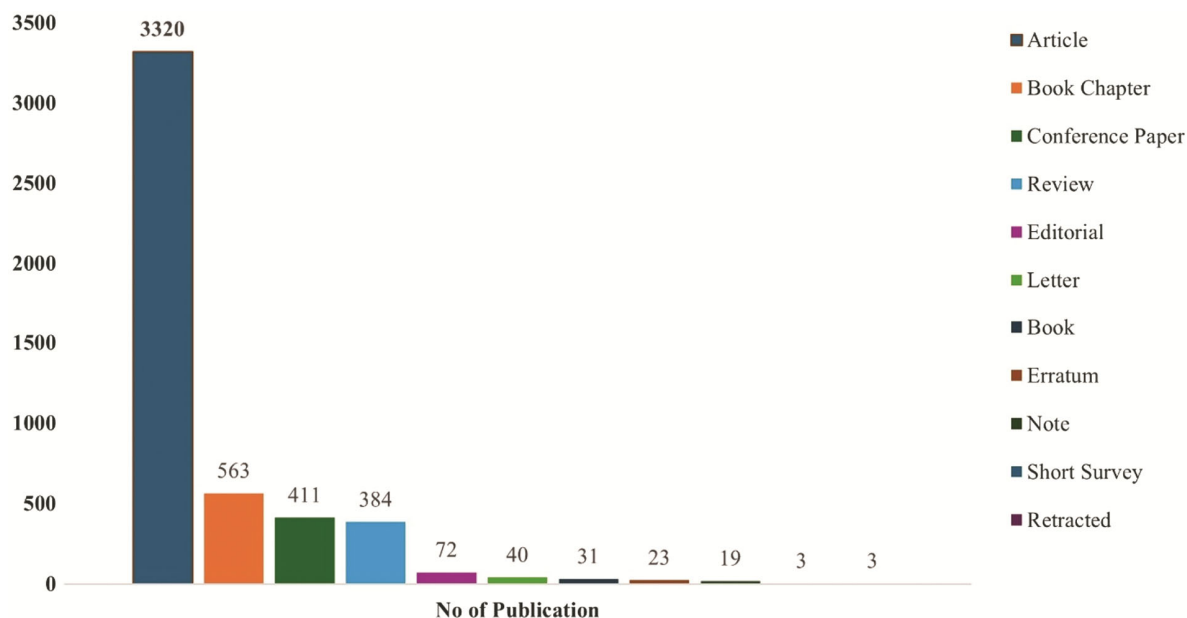


Fig. 4 — Distribution of publications across different document types *Top 20 Subject Area*

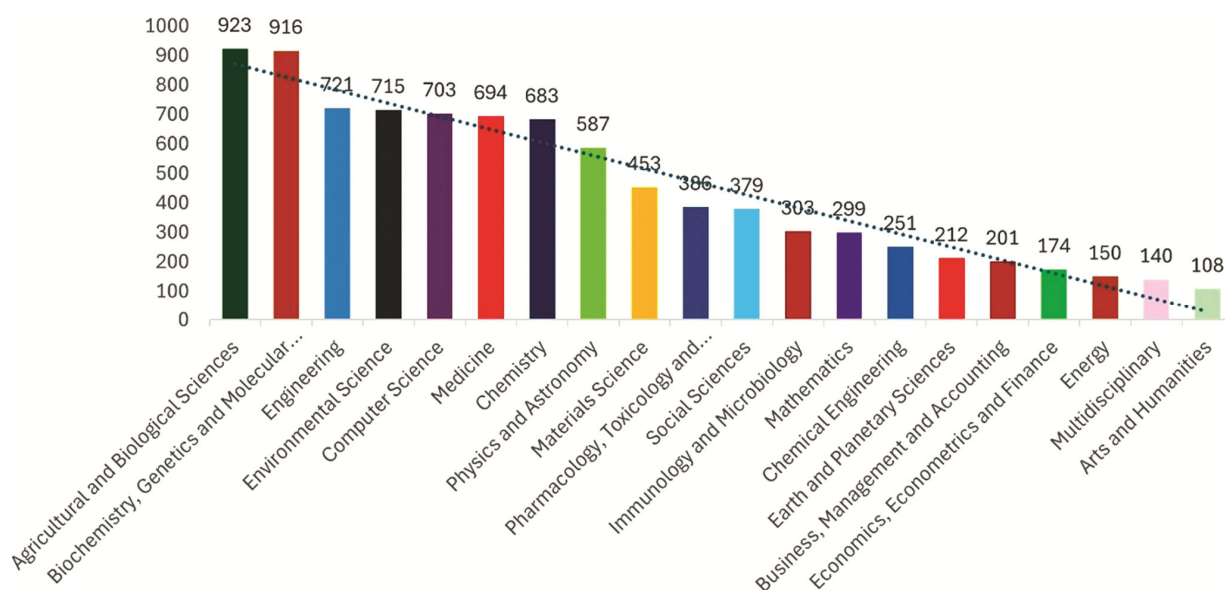


Fig. 5 — Distribution of publications from Assam University by the top 20 subjects, indicating that the university has a high profile in multidisciplinary research.

research. Agricultural and Biological Sciences and Biochemistry, Genetics and Molecular Biology make the largest contributions with (923, 10.26%) and (916, 10.18%), respectively, and have significant contributions to Engineering (721, 8.01%), Environmental Science (715, 7.95%), and Computer Science (703, 7.81%). Other significant ones are Medicine (694, 7.71%) and Chemistry (683, 7.59%), which place great emphasis on science and technology.

5.7 Top 20 Prolific authors with the most publications

Table 5 and Figure 6 shows the most prolific writers at Assam University, along with their publication counts and h-indices. The first author is Roychoudhury, S., with 172 publications (8.85%) and an h-index of 36, followed by Nath, A.J., with 160 publications (8.23%) and an h-index of 33. Others with significant contributions are Bhattacharjee, A. 124 (6.38%), Pandey, P. 122 (6.28%), h-index of 35, and Das, A.K. 121 (6.23%), h-index of 29.

Table 5 — Top 20 most prolific authors at Assam University, along with their publication counts and h-indices

Author Name	No of publication	% of 1943	h-Index
Roychoudhury, S.	172	8.85%	36
Nath, A.J.	160	8.23%	33
Bhattacharjee, A.	124	6.38%	22
Pandey, P.	122	6.28%	35
Das, A.K.	121	6.23%	29
Sarkar, U.	119	6.12%	41
Borah, A.	116	5.97%	33
Chakraborty, S.	108	5.56%	23
Panda, S.K.	98	5.04%	48
Choudhury, M.D.	91	4.68%	23
Ghosh, S.K.	91	4.68%	23
Bhattacharjee, C.R.	83	4.27%	21
Talukdar, A.D.	81	4.17%	25
Mondal, P.	74	3.81%	18
Giri, S.	68	3.50%	21
Sharma, G.D.	67	3.45%	13
Das, D.	63	3.24%	14
Sen, A.K.	62	3.19%	17
Rout, J.	62	3.19%	19
Mukhopadhyay, S.	61	3.14%	11
Total	1943	100.00%	

5.8 Collaborations of Nations

Figure 7 shows the bibliographic coupling among countries using VOSviewer, illustrating the interconnections among research collaborations. A maximum of 25 countries were selected, and each country must have at least 5 documents. A total of 80 of those 25 countries meet the threshold.

International collaboration of Assam University in terms of co-authored publications with various countries. Predictably, India leads with 4866 publications, indicating that the majority of research is conducted within the country. The US has the highest number of international partners 230, Saudi Arabia 104, the UK 83, and the Czech Republic 81. Other important partners would be Slovakia (79), South Korea (70), Japan (64), and Malaysia (54).

5.9 Top 20 Affiliations along with the Assam University

The Table 6 indicates the institution-wise pattern of collaboration at Assam University. It can be seen that Assam University has the most publications, 4868 (78.25%), meaning that most of the research output is internally produced. Strong local collaboration is also evident, with Silchar Medical College (112, 1.80%) and NIT Silchar (94, 1.51%) as the top partnership

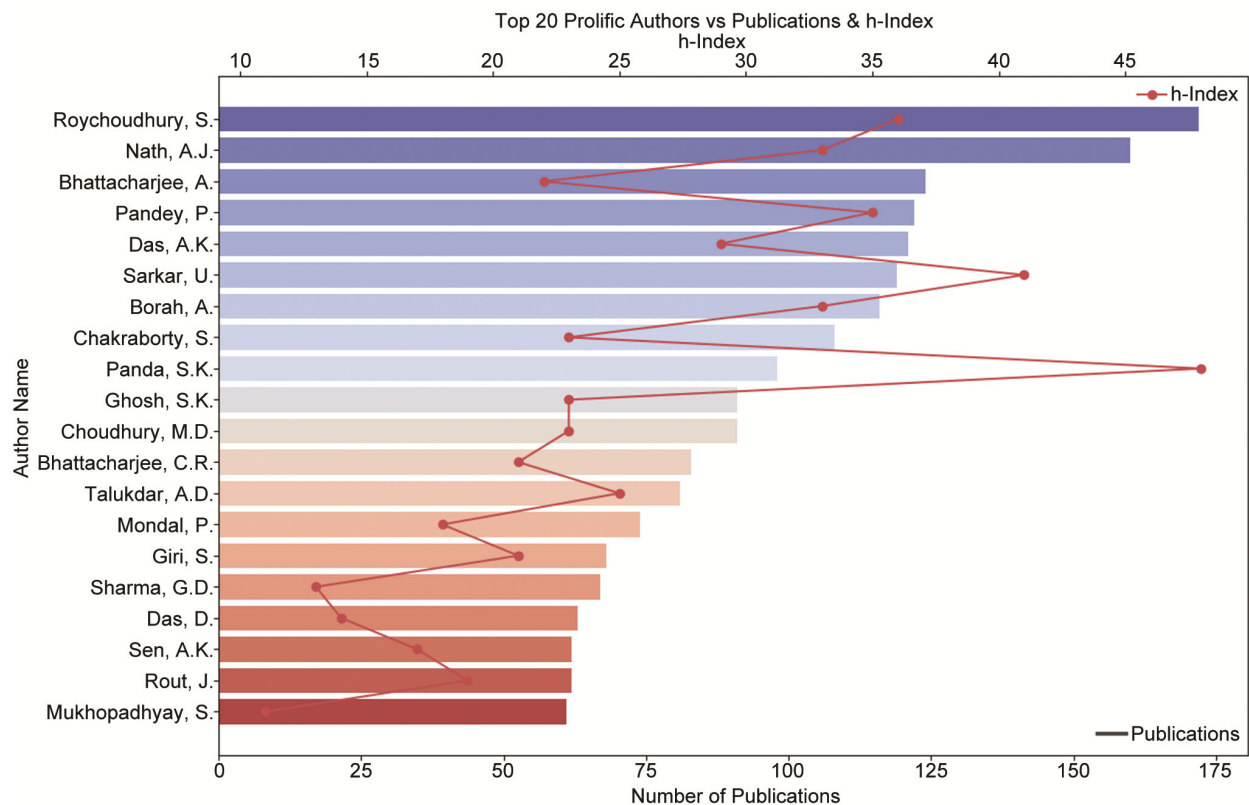


Fig. 6 — Graphical representation of the top 20 most prolific authors at Assam University, along with their publication counts and h-indices *Collaborations of Nations*

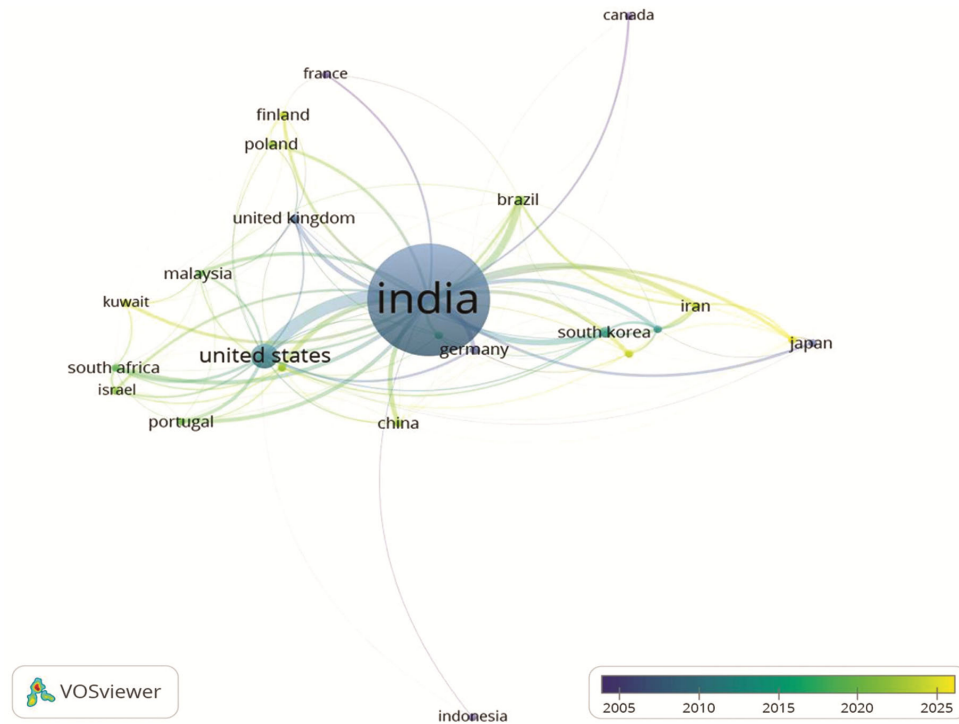


Fig. 7 — Bibliographic coupling among countries using VOSviewer, illustrating the interconnections among research collaborations

Table 6 — Institution-wise top 20 pattern of collaboration at Assam University.

Affiliation	No of Publication	% of 6221
Assam University	4868	78.25%
Silchar Medical College	112	1.80%
National Institute of Technology Silchar	94	1.51%
Dibrugarh University	78	1.25%
Jadavpur University	78	1.25%
North-Eastern Hill University	77	1.24%
University of Kalyani	76	1.22%
Slovak University of Agriculture in Nitra	75	1.21%
NIPER, Ahmedabad	75	1.21%
Gauhati University	74	1.19%
Mizoram University	66	1.06%
Assam University, School of Life Sciences	65	1.04%
Karimganj College	62	1.00%
Banaras Hindu University	59	0.95%
Tripura University	57	0.92%
University of Calcutta	55	0.88%
Mendelova Univerzita v Brně	53	0.85%
Indian Institute of Technology Kharagpur	52	0.84%
Indian Institute of Technology Guwahati	49	0.79%
Manipur University	48	0.77%
Indian Council of Agricultural Research	48	0.77%
Total	6221	100.00%

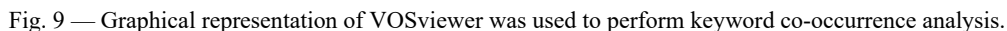
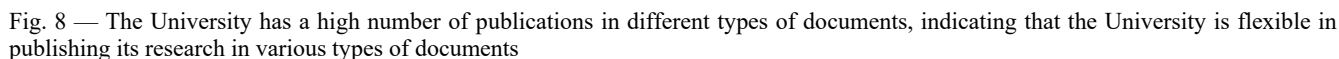
institutions. Others, such as Dibrugarh University and Jadavpur University (78 and 78, respectively; 1.25%), are also significant contributors, followed by NEHU (77; 1.24%) and the University of Kalyani (76; 1.22%).

5.10 Type of Sources

As shown in Figure 8, the University has a high number of journal publications, totalling 3816 (78.37%), indicating that the University favours publishing its research in journals. It is then followed by books (10.49%), conference proceedings (5.87%), and book series (5.22%), which moderately fill in the gaps. The trade journals (0.04) are also insignificant. On the whole, the information points out journals as the main channel of communication.

5.11 Keywords co-occurrences

In Figure 9, VOSviewer was used to perform keyword co-occurrence analysis. A set of keywords to analyse was prepared, and a minimum threshold was set to meet 1073; a minimum of 5 occurrences of the keyword is 5, and a total of 14775 keywords occur; out of those, 1000 keywords are selected. The visualisation and construction of the keyword co-occurrence network were performed in VOSviewer, where co-occurrence links represent visual relationships among keywords.



(2.95%), and *Density functional theory* (2.22%), which have been used both in biological and chemical sciences. The keyword search results in dominance of health, biological, and experimental research domains.

The study shows a slow increase in research productivity at Assam University during (1994-2025),

with an average AGR of 18.72, but in the early years, it showed poor and inconsistent output. Publications and citations have increased rapidly since 2010, with the highest productivity in 2025 (536 publications). The recent decrease in citations is attributed to a time lag. Relative Growth Rate (RGR) is declining over time, while Doubling Time (DT) is increasing, indicating maturation and stabilisation of the research output. The level of collaboration is very high, with a Collaboration degree of 0.95, and the majority of papers are multi-authored (4625 of 4869). The largest document type (68.19%) is articles, whereas journals account for the majority (78.37%). The university has an interest in STEM subjects, in particular, Agricultural Sciences (10.26%) and Biochemistry (10.18%). Some of the authors make significant contributions, such as Roychoudhury, S., who has the most publications (172), and Panda, S.K., who has the highest impact (h-index 48). The institution-centric research is mostly dominant in research with Assam University contributing (78.25%), which is backed by regional partnerships. There is good international cooperation, particularly with the USA (230) and other developed countries. The keywords indicate a strong focus on biomedical, life sciences, and experimental research.

7 Conclusion

The study examines the research output of Assam University, Silchar, from its inception (1994-2025), and the data are limited to the Scopus Database. The study provides valuable insights into research productivity, collaboration patterns, citation impact, strengths, trends, and areas for improvement. The rapid growth in publication, along with the high level of cooperation, indicates that the research output is strong and wide-ranging. The RGR may have decreased while DT has been rising, suggesting a shift toward maturity and stability in research output. The presence of journals and STEM publications across disciplines shows the university's academic orientation. Although institutional and national collaboration are robust, international collaboration can be strengthened to enable broader research across all fields. So far, the research highlights the university's growing role in academic research and the potential for its further development.

8 References

Journals

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