

# Mapping Global Sustainable Development Goals (SDGs) Research: A Scientometric Perspective

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## Abstract

This study examines the status and trends of research on the Sustainable Development Goals (SDGs) from 2015 to 2024. Analysing 14,845 documents published across 2301 sources, SDGs research during a specified span shows a growth rate of 21.20% in SDGs-related research. The analysis reveals a high research impact, with an average of 18.78 citations per document. Key research themes identified include Climate Change, Health, Renewable Energy, Education, and Social Development. Network analysis reveals strong co-authorship clusters among institutions, with the Chinese Academy of Sciences, the University of Oxford, and the WHO emerging as prominent contributors. The countries China, the United States, and the UK lead in publication output. The study highlights the growing interdisciplinary nature of Sustainable Development Goals (SDGs) research, emphasizing the integration of technology and the importance of global collaboration.

## 1. Introduction

The Sustainable Development Goals (SDGs) are a global framework established to tackle the most significant issues facing the globe in social, environmental, and economic spheres. The Sustainable Development Goals (SDGs) were presented at the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro, Brazil, in June 2012 and officially adopted in 2015 when all 193 United Nations member states, along with various nongovernmental organizations (NGOs), pledged to accomplish these ambitious objectives by 2030. The SDGs, commonly known as the “Global Goals” or “Agenda 2030”, advocate for a comprehensive approach to development, prioritizing inclusion and sustainability for all countries.

The Sustainable Development Goals (SDGs) were established as an inclusive framework aimed at ensuring no one is marginalized, promoting cooperation among governments, the commercial sector, civil society, and individuals. The global community monitors progress and highlights areas needing greater focus to achieve these objectives within the designated timeframe through yearly reports submitted by the UN Secretary-General.

This research study examines the status and trends of research on the Sustainable Development Goals (SDGs) worldwide, focusing on several scientometric aspects, such as research productivity, research impact, and collaborations among countries, institutions, academics, and researchers. As the SDGs were officially adopted in 2015, the study period spans from the beginning of 2015 to the end of 2024.

## 2. Background Studies

Some of the studies observed in this domain have presented a comprehensive bibliometric review of scientific research related to the Environment, Energy Conservation, and

Sustainability. These studies provide valuable insights into the current landscape and trends in the field of Sustainable Development Goals, and related links can be identified through them. Few of them have been considered background studies for a better understanding of the topic. NITI Aayog, an Indian Government think tank, has also taken numerous initiatives to propel the SDG agenda forward, with key policies and programs aimed at fostering inclusive and sustainable development. This has motivated researchers to analyze the global contribution towards SDGs through a comprehensive scientometric study. The study will provide information about the scale of research over the past decade and recent trends in this field (NITI Aayog, 2019).

Qasim (2017) uses a hybrid method of scientometric analysis and traditional literature review to summarize the scientific developments and categorize the details in the large body of literature on measuring progress towards sustainability and well-being (SaW).

Amsaveni and Harikrishnan (2018) used scientometric analysis techniques to examine the most prolific authors and journals in environmental management research from 1989 to 2014, based on a dataset of over 61,000 research articles, including identifying the most prolific authors and journals in this field.

Alejandro-Cruz et al. (2019) analyze how the concept of sustainability is being incorporated into global research on higher education, using text-mining techniques to generate bibliometric indicators and science maps.

Roy et al. (2022) using the Web of Science database, researchers focused on a single UN SDG goal-related publication spanned 2015–2021. Studies were performed on the chosen 289 publications. With the analysis of Keywords Plus, abstracts, titles, as well as author keywords, author looked at the performance of authors, publications, journals, institutions, and nations in terms of publishing.

Bangani and Dube (2023) highlighted how South African academic libraries contribute to SDGs 2 (Zero Hunger), 3 (Good Health and Well-being), and 13 (Climate Action) through community engagement. its include food drives for vulnerable groups, health literacy programs, blood donation campaigns, and environmental activities like recycling and tree planting. The study underscores the importance of aligning library efforts with SDGs to address societal challenges beyond traditional academic roles.

Xu et al. (2023) present a systematic review of ecotourism research, finding that it has been developing rapidly in recent years as an interdisciplinary subject and that the evolution of ecotourism research can be divided into three main phases: human disturbance, ecosystem services, and sustainable development.

Devi et al. (2024) investigated the role of IFLA in mobilizing libraries globally to support the United Nations' 2030 Agenda for Sustainable Development. The study examined libraries' contribution to literacy, climate action, cultural enrichment, and reducing inequality, urging stronger collaboration on library systems and adoption of SDG-aligned policies.

Singh (2024) conducted a scientometric analysis of research on sustainable development and environmental concerns, using data from 2,258 publications downloaded from the Scopus database and analyzed using VOSviewer software.

### **3. Method and Material**

The data under study were harvested from the Web of Science database. The search string employed was “Sustainable Development Goals” OR “SDG” OR “SDGs.” The search

timespan is set from January 1, 2015, to December 31, 2024 (based on the WoS Index). A total of 14885 records were retrieved, and 40 records were eliminated during pre-processing and de-duplication. Data analysis and visualization were performed using Microsoft Excel, HistCite, and VOSviewer.

## 4. Analysis and Discussion

### 4.1 General information about data

Table 1 presents general information metrics related to research on the Sustainable Development Goals (SDGs) between 2015 and 2024. It shows that 14,845 documents were published across 2301 sources during this period. The research field has experienced significant growth, with a growth rate of 21.20%. On average, each document has 18.78 citations, suggesting a high level of impact within the scientific community on SDGs topic. The table also indicates that a total of 51,046 authors contributed to these publications, with 1270 of them being the sole authors for publishing the research on Sustainable Development Goals (SDGs).

**Table 1: General Information**

<b>Timespan</b>	<b>2015:2024</b>
Sources (Journals, Books, etc.)	2301
Documents	14845
Growth Rate %	21.20
Document Average Age	3.18
Average citations per doc	18.78
References	697034
Authors	51046
Authors of single-authored docs	1270
Single-authored docs	1421

### 4.2 Research productivity on SDGs

Table 2 presents data on research productivity pertaining to the Sustainable Development Goals (SDGs) from 2015 to 2024. The number of publications shows a consistent increase from 137 in 2015 to 4039 in 2024, indicating a steady growth in research output related to the SDGs. The Total Local Citation Score and Total Global Citation Score show an increase over time, suggesting that SDG-related research is gaining increasing recognition and influence within both regional and global academic communities. As citable years decrease, newer publications have fewer or inconsistent citations, which is expected as newer publications have fewer years to accumulate citations.

**Table 2: Research Productivity, Growth and Citations**

<b>Sr. No.</b>	<b>Publication Year</b>	<b>Records</b>	<b>AGR</b>	<b>Percentage</b>	<b>TLCS</b>	<b>TGCS</b>	<b>Citable Years</b>
1	2015	137	0.00	0.9	342	4253	10
2	2016	235	0.72	1.6	1696	16697	9
3	2017	344	0.46	2.3	2187	15249	8
4	2018	593	0.72	4	3343	32043	7
5	2019	893	0.51	6	4222	36637	6
6	2020	1354	0.52	9.1	2484	46867	5
7	2021	1940	0.43	13.1	1935	48608	4
8	2022	2422	0.25	16.3	1932	43356	3
9	2023	2888	0.19	19.5	1151	26556	2
10	2024	4039	0.40	27.2	459	9345	1
<b>Total ☺</b>				<b>100</b>	<b>19751</b>	<b>279611</b>	<b>10 years</b>

#### 4.3 Most productive authors contributing to research on SDGs

Table 3 shows ranks the top 15 most productive authors contributing to research on the Sustainable Development Goals (SDGs). Leal W leads the list with 50 publications, followed closely by Kumar A with 47 publications and Sinha A with 46.

In terms of research impact, as measured using the Total Global Citation Score per Year (TGCS/t), Sinha A again emerges as the top author with a score of 844.71, indicating a high level of influence within the global research community. Adebayo TS ranks second with a score of 648.97, followed by Singh A with a score of 460.94. This table provides valuable insights into the scholarly contributions of leading researchers in the SDG domain, highlighting their significant research output and global impact.

**Table 3: Top-Producing Authors in SDGs Research**

Sr. No.	Author	Records	Percentage	TLCS	TLCS/t	TGCS	TGCS/t	Ranking (TGCS/t)
1	Leal, W.	50	0.3	558	84.3	2330	436.2	4
2	Kumar, A.	47	0.3	5	1.45	509	137.03	11
3	Sinha, A.	46	0.3	93	23.47	3701	844.71	1
4	Adebayo, T.S.	43	0.3	126	37.88	2054	648.97	2
5	Kumar, S.	42	0.3	27	6.22	2129	351.95	6
6	Bekun, F.V.	40	0.3	92	22.54	1324	339.55	7
7	Kumar, P.	36	0.2	93	13.76	1081	198.36	10
8	Liu, Y.	36	0.2	152	21.51	3279	412.74	5
9	Singh, A.	36	0.2	97	17.53	3103	460.94	3
10	Li, Y.	35	0.2	22	2.2	1712	216.69	9
11	Zhang, L.	34	0.2	7	1.75	317	80.52	14
12	Wang, Y.	32	0.2	5	1.64	163	45.4	15
13	Chen, Y.	30	0.2	41	10.1	483	101.52	13
14	Abbas, S.	29	0.2	43	13.83	709	219.75	8
15	Singh, R.	29	0.2	1	0.33	419	117.63	12

#### 4.4 Major publications contributing to research on SDGs

Table 4 highlighted the top journals contributing to research on the Sustainable Development Goals (SDGs), based on the number of publications recorded. Sustainability is the most prolific journal, with 2043 publications, constituting 13.8% of the total. Second in the list is the Journal of Cleaner Production, with 431 papers, which accounts for 2.9% of the total records. This is followed by Sustainable Development, with 300 records, representing 2% of the overall production during the period 2015-24.

The table includes citation metrics, such as Total Local Citation Score (TLCS) and Total Global Citation Score (TGCS). While the publication Sustainability Science boasts the highest TLCS (1901), Sustainability takes the lead in TGCS with 26514, indicating their significant global impact within the research community.

The ranking column provides a comprehensive overview of the journals' contributions, considering both publication volume and citation impact. It offers valuable insights into the key journals shaping the SDG research landscape.

**Table 4: Major Contributing Publications**

<b>Sr. No.</b>	<b>Journal</b>	<b>Records</b>	<b>Percentage</b>	<b>TLCS</b>	<b>TGCS</b>	<b>Ranking (TGCS)</b>
1	Sustainability	2043	13.8	116	26514	1
2	Journal of Cleaner Production	431	2.9	874	17101	2
3	Sustainable Development	300	2	1506	6118	4
4	Environmental Science and Pollution Research	213	1.4	392	4209	6
5	Science of the Total Environment	182	1.2	129	8468	3
6	Environment Development and Sustainability	177	1.2	283	2005	10
7	PLOS One	173	1.2	0	1581	14
8	Energies	161	1.1	0	1643	13
9	International Journal of Sustainability in Higher Education	157	1.1	480	1862	11
10	Journal of Environmental Management	150	1	33	3939	7
11	Heliyon	136	0.9	0	1009	15
12	Water	134	0.9	0	1736	12
13	Remote Sensing	129	0.9	0	2047	8
14	International Journal of Environmental Research and Public Health	120	0.8	0	2027	9
15	Sustainability Science	117	0.8	1901	4657	5

#### 4.5 Major institutions contributing research on SDGs

Table 5 noted the top 15 institutions contributing to research on the Sustainable Development Goals (SDGs), based on the number of publications recorded. The Chinese Academy of Sciences is shown as the most influential institution, with 411 publications, followed by the University of Chinese Academy of Sciences with 207 publications, and then the University of Oxford with 173 publications.

The table also includes citation metrics, such as Total Local Citation Score (TLCS) and Total Global Citation Score (TGCS). While the University of Oxford/University College London boasts the highest TLCS (1013), the WHO takes the lead in TGCS with a score of 11706, indicating its significant global impact.

The ranking column provides a comprehensive overview of the institutions' contribution, considering citation impact. The table offers valuable insights into the key institutions driving research and shaping the SDG discourse. Several prestigious universities, including the University of Oxford, University College London, and the University of Cape Town, feature prominently in the list, emphasizing the crucial role of academic research in addressing the SDGs. The presence of institutions like the Chinese Academy of Sciences, the University of Chinese Academy of Sciences, the Lebanese American University, and the University of São Paulo highlights the growing research capacity and influence of institutions in developing countries.

**Table 5: Major contributing institutions**

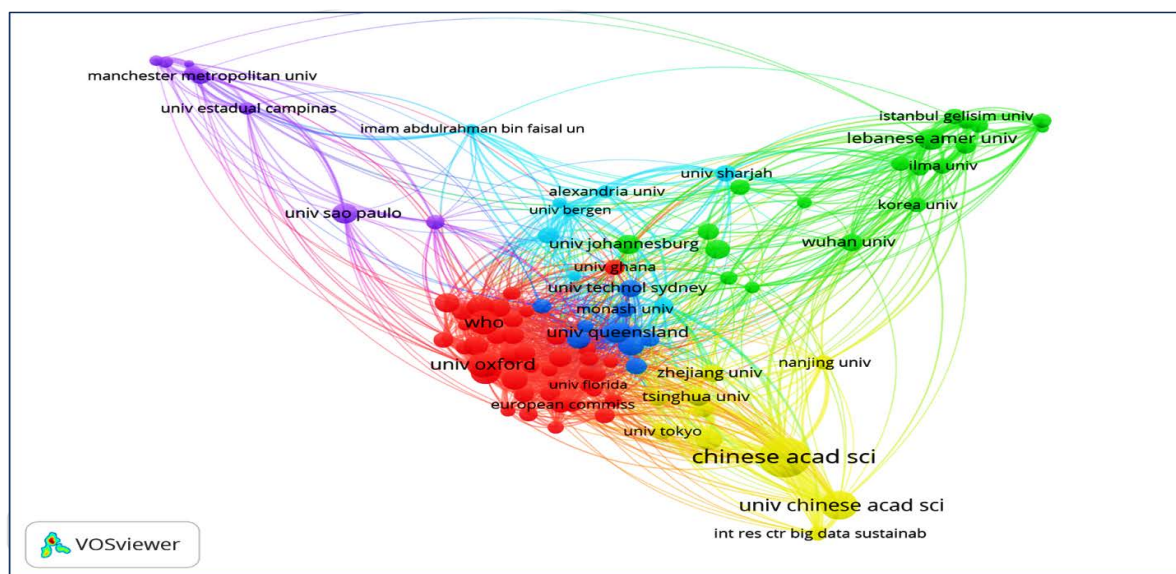
Sr. No.	Institution	Records	Percentage	TLCS	TGCS	Ranking (TGCS)
1	Chinese Academy of Sciences	411	2.8	493	8651	6
2	University of Chinese Academy of Sciences	207	1.4	111	3390	13
3	University of Oxford	173	1.2	595	11430	2
4	University College London (UCL)	153	1	1013	9595	4
5	WHO	153	1	414	11706	1
6	University of Cape Town	126	0.8	372	8613	7
7	University of São Paulo (USP)	120	0.8	267	6696	10
8	University of Melbourne	117	0.8	426	9224	5
9	Lebanese American University	115	0.8	78	1751	15
10	University of Queensland	115	0.8	498	7856	9
11	Utrecht University	114	0.8	625	5674	12
12	Beijing Normal University	113	0.8	171	2720	14
13	King Saud University	105	0.7	212	5787	11
14	London School of Hygiene & Tropical Medicine	105	0.7	328	10042	3
15	Imperial College London	101	0.7	343	8535	8

#### 4.6 Co-authorship network between major contributing Institutions on SDGs Research

Network Diagram 1 provides valuable insights into the co-authorship patterns among institutions involved in SDG research. It highlights the growing importance of global collaboration, the emergence of research hubs, and the increasing influence of institutions from developing countries.

Chinese Academy of Sciences and the University of Chinese Academy of Sciences form a cluster, suggesting strong collaboration within the Chinese research ecosystem. Institutions namely the University of Oxford, the University of Tokyo, and the European Commission appear to be well-connected, indicating a strong influence of Western research institutions.

Institutions from the Global South, such as the University of São Paulo and the University of Cape Town, have connections with institutions from both the Global North and South, suggesting growing collaborations across regions. The WHO appears as a central node with connections to various institutions, highlighting its role in fostering collaborations and coordinating research efforts related to the SDGs.



**Network Diagram 1: Co-authorship Network Between Contributing Institutes**

#### 4.7 Major countries contributing on SDGs Research

Table 6 presents the top countries contributing to research on the Sustainable Development Goals (SDGs), based on the number of publications recorded. The Peoples Republic of China leads the list with 2613 publications, constituting 17.7% of the total. Following countries are USA (2114) with 14.2% of total and UK with 2098 publications and 14.1% of the total in third position.

The table also includes citation metrics, such as Total Local Citation Score (TLCS) and Total Global Citation Score (TGCS). While the UK boasts the highest TLCS (5973), the USA takes the lead in TGCS with a score of 69565, indicating its significant global impact. India significantly ranks fourth in research on the Sustainable Development Goals (SDGs), contributing 1489 records with 34,491 citations.

**Table 6: Major countries contributing on SDGs Research**

Sr. No.	Country	Records	Percent	TLCS	TGCS	Ranking (TGCS)
1	Peoples R China	2623	17.7	2110	57151	3
2	USA	2114	14.2	4817	69565	1
3	UK	2098	14.1	5973	67773	2
4	India	1489	10	1239	34491	6
5	Australia	1165	7.8	3528	40444	4
6	Spain	1048	7.1	964	25659	9
7	Germany	957	6.4	3257	34585	5
8	Italy	887	6	1741	31083	7
9	Canada	729	4.9	1520	24731	10
10	South Africa	718	4.8	1262	24019	11
11	Netherlands	626	4.2	2102	28739	8
12	Brazil	617	4.2	1319	17478	13
13	Pakistan	561	3.8	645	18978	12
14	Malaysia	536	3.6	581	16121	14
15	Japan	534	3.6	1033	15585	15

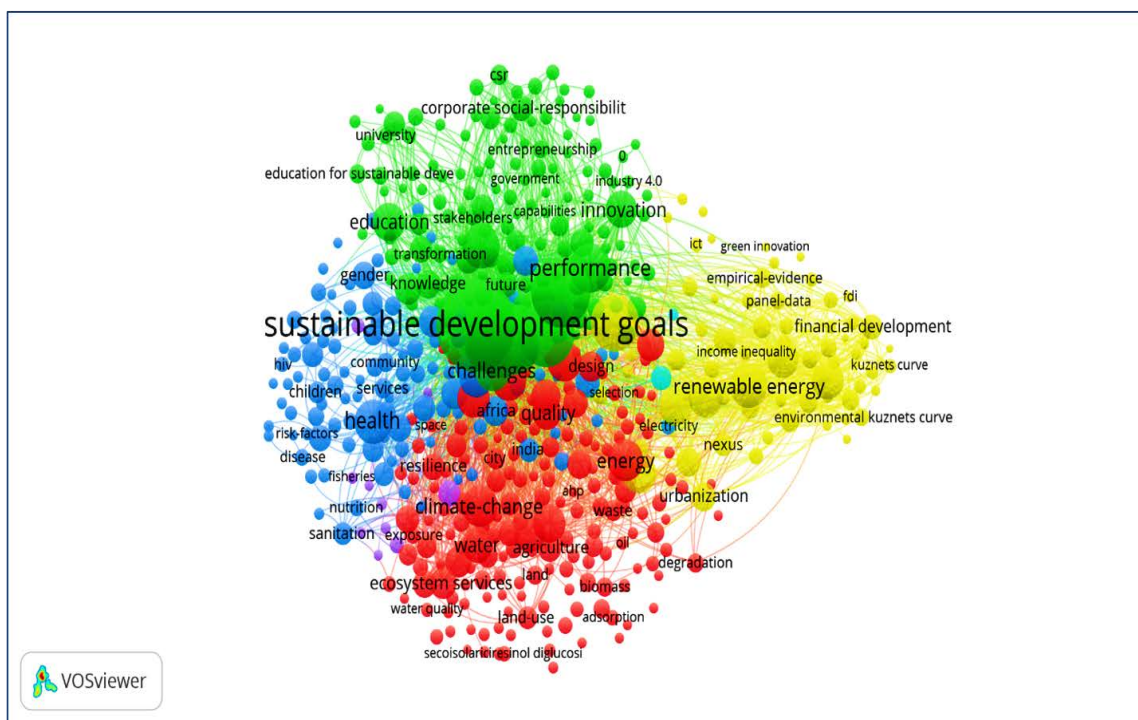
#### 4.8 Research trend dynamics in SDGs research:

Network diagram 2 provides valuable insights into the trend dynamics of research topics related to the Sustainable Development Goals (SDGs). It reveals a growing focus on important SDGs such as “climate change,” “health,” “renewable energy,” “education,” and “innovation,” clustered around the central theme of “Sustainable Development Goals.” This demonstrates an increasing emphasis on interdisciplinary approaches and the integration of technological advancements in addressing sustainable development challenges. Terms like “Climate Change,” “Renewable Energy,” “Innovation,” “Health,” and “Education” appear as larger nodes, suggesting they are sub-central themes with strong connections to other research areas.

Another cluster focuses on Social Development, linking terms like “Education,” “Future,” “Capabilities,” “Gender,” and “Knowledge.” This cluster highlights the social dimensions of sustainable development.

A cluster around “Performance” connects with terms like “Innovation,” “Industry 4.0,” and “Entrepreneurship,” suggesting research on economic growth models that are environmentally and socially sustainable.

Terms like “Agriculture,” “Ecosystem Services,” “Biomass,” “Resilience,” and “Degradation” appear in a cluster related to Climate Change, indicating essential topics like food safety and security within the SDG context.



## 5. Conclusion

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