

# Scientometric Analysis of Greenhouse Effect Research Output: A Study



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## Abstract

This research paper attempts to analyze quantitatively the growth and development of Greenhouse Effect in global terms of publication output as reflected in Web of Science (WOS) database during 2000 to 2017. A total of 2214 papers were published by the researchers in various domains; in the Research areas Astronomy Astrophysics topped with 90 documents (4.07%) were published. The total of 2214 publications in the global parameters, the highest number of publications were 1515 (68.43%) Articles. The Brazil ranked topped with 90 (4.065%) Publications. . The highest numbers of publications were in Engineering 571 (25.79%) followed by Energy Fuels 321 (14.50%).

**Keywords:** Scientometrics, Greenhouse Effect (GE), Year wise distribution, Country wise Distribution, Language Wise Distribution.

## Introduction

Scientometrics is quantitative methods of application in measuring science based on published literature and communication. This could include identifying the talented areas of scientific research, examining the development of research over time, or geographic and organizational distributions of research. In this study, we did the Scientometrics analysis of Greenhouse Effect, a considerably growing area in the knowledge driven world.

## Review of Literature

Chinnaraj Murugan (2018) explored the Colorectal Cancer research scholarly communications published by Indian researchers based on the data available in web of science database for the period of 12 years (2005- 2016). The study exposed that there is an increasing trend in total CRC research publications and majority of the publications are in the form of articles both in case of India and world. Author find out that India's highest collaborating country is USA 15.6% of the total collaborative works undertaken. Panjab University has the highest number of publications with 62 records have a Total Local Citation (TLC) Score 80 and Total Global Citation Score (GTLC) 551. It can be accomplished that number of initiative has been already took by different organization and researchers to address the issue of CRC in India. India is the 6th most most prevalent disease as per the statistics of CRC at the same time India is the 24th position globally comes in the terms of research publication output.

Harikrishnan. CA (2018) observed on this most prolific authors and journals in the environmental management research output during 1989 to 2014. The total sample data retrieved from the database of Web of Knowledge, includes, SCI, SSCI, A&HCI. Total records of 61877 research articles collected from 22 types of various sources and its applicability of Bradford's law and Lotka's law methods was also tested. Author analyzed the results, it is recognized the year 2006 has highest number h-index values. 2014 has highest productivity, highest cited references and highest number of contributed authors.

Rajani S. and Ravi B. (2017) analyzed the present status of Indian research output in mathematical science research during the period 1999–2014 by used in web of science database retrieved from the Science Citation Index (SCI). The Studies analyzed on different parameters including mapping of world research output, rank-wise and global publication, Indian research output and its relative growth rate, doubling time, exponential growth rate, subject-wise categories and word wise distribution by used the HistCite software. Their finalized study and examined the topmost of an author highly cited reference in Indian mathematical science research output.

R.Karpagam (2014) found out and analyzed on Scopus database was conducted to calculate Nano-biotechnology research output from a 2003–2012. The author studied and analysed Nano-biotechnology research on different parameters, including the growth, global publications share and citation impact. The total of 114,684 articles was published during the period of 2003–2012. h-index (349), g-index (541), hg-index (434.52) and p-index (326.47). Nano Letters had the highest impact with an average citation per paper (73.86).

### Scope and Methodology

The present study attempts to find out the publication pattern of global researchers in the field of Greenhouse Effect (GE). The study is based on the references and aims to analyze quantitatively the growth and development of Greenhouse Effect (GE) research in world terms of publication output as reflected in Web of Science (WOS) database during years, 2000 to 2017.

### Objectives of The Study

The main objective of the study is to present the growth of literature and make the quantitative

assessment of status of Greenhouse Effect (GE) research by analyzing the different features.

### The Specific Objectives are:

1. To Identify the Year-wise Distribution of Publications
2. To Measure the Document Wise Distribution
3. To Find out Category wise distribution
4. To Measure the Country wise Distribution
5. To Measure the Research Area wise Distribution
6. To Measure the Language Wise Distribution

### Results and Discussions

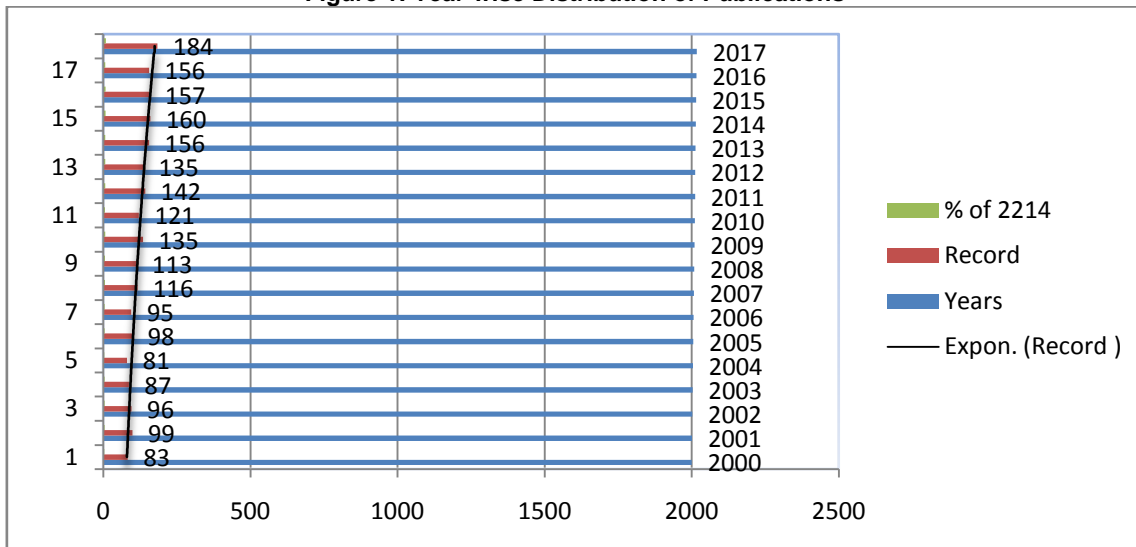
#### Year-wise Distribution of Publications

During the study period 2000 to 2017 the year wise analyses the Greenhouse effect research output of World. As per the Web of Science (WOS) data, cumulative publications growth, the output of through the world had increased from 116 publications during 2007 to 184 publications during 2017. The global research output in Greenhouse Effect research output has 2004 (81 Publication). The trend shows a steady and significant increase in the publications (Table 1) (Figure 1). (Table 1 and Figure 1 show 18 years contributions).

**Table 1: Year-wise Distribution of Publications**

Sl. No.	Years	Record	% of 2214	Cumulative	Cumulative %
1	2000	83	3.75	83	3.75
2	2001	99	4.47	182	8.22
3	2002	96	4.34	278	12.56
4	2003	87	3.93	365	16.49
5	2004	81	3.66	446	20.14
6	2005	98	4.43	544	24.57
7	2006	95	4.29	639	28.86
8	2007	116	5.24	755	34.10
9	2008	113	5.10	868	39.21
10	2009	135	6.10	1003	45.30
11	2010	121	5.47	1124	50.77
12	2011	142	6.41	1266	57.18
13	2012	135	6.10	1401	63.28
14	2013	156	7.05	1557	70.33
15	2014	160	7.23	1717	77.55
16	2015	157	7.09	1874	84.64
17	2016	156	7.05	2030	91.69
18	2017	184	8.31	2214	100
Total		2214	100		

**Figure 1: Year-wise Distribution of Publications**



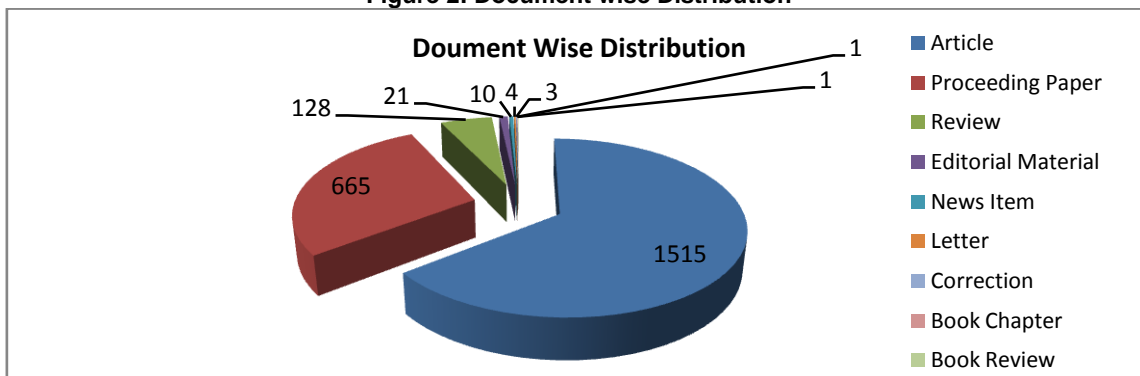
**Document Wise Distribution**

The total of 2214 publications in the global parameters, the highest number of publications were 1515 (68.43%) Articles, Proceeding Paper 665 (30.04%), Review 128 (5.78%), Editorial Material 21 (0.95%), News Item 10 (0.45%), and so on. (Table 2 and Figure 2 show the document wise contributions clearly).

**Table 2: Document Wise Distribution**

Sl. No	Document Type	Record	% of 2214
1	Article	1515	68.43%
2	Proceeding Paper	665	30.04%
3	Review	128	5.78%
4	Editorial Material	21	0.95%
5	News Item	10	0.45%
6	Letter	4	0.18%
7	Correction	3	0.14%
8	Book Chapter	1	0.05%
9	Book Review	1	0.05%

**Figure 2: Document wise Distribution**



**Category wise distribution**

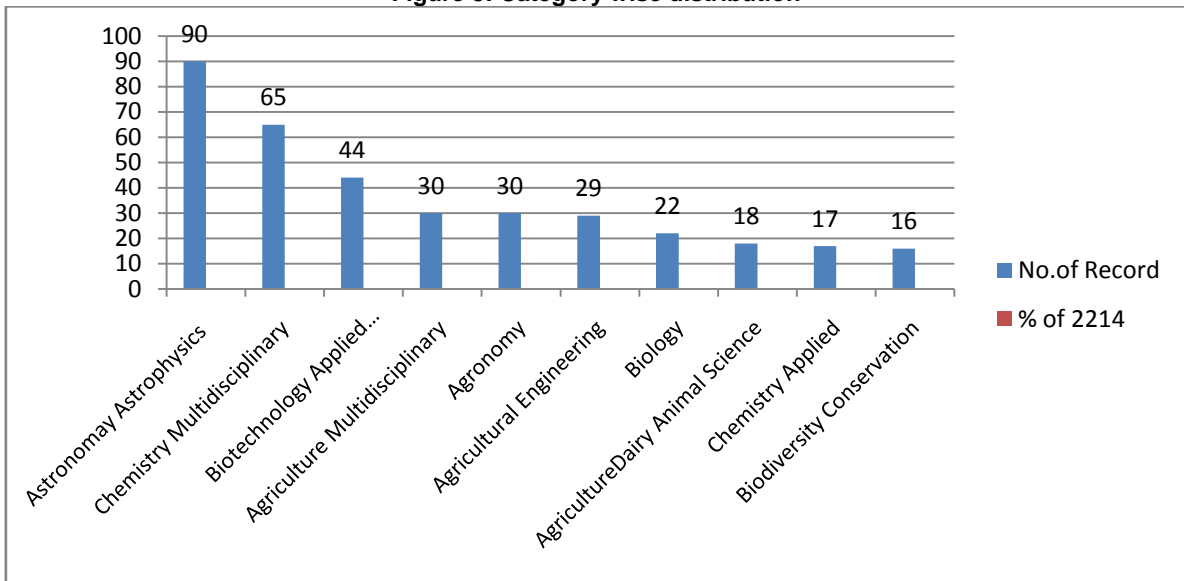
The global Greenhouse Effect (GE) has produced 24 Category wise in the Web of Science (WOS) Astronomy Astrophysics 90 (4.07%), Chemistry Multidisciplinary 65 (2.94%), Biotechnology Applied Microbiology 44 (1.99%), Agriculture Multidisciplinary 30 (1.36%) and so on. (Table 4 and Figure 4 clearly show the top 25 Category wise contributions).

**Table 3: Category wise distribution**

Sl. No.	Subject wise Distribution	Records	% of 2214
1	Astronomy Astrophysics	90	4.07%
2	Chemistry Multidisciplinary	65	2.94%
3	Biotechnology Applied Microbiology	44	1.99%
4	Agriculture Multidisciplinary	30	1.36%
5	Agronomy	30	1.36%
6	Agricultural Engineering	29	1.31%
7	Biology	22	0.99%
8	Agriculture Dairy Animal Science	18	0.81%

9	Chemistry Applied	17	0.77%	10	Biodiversity Conservation	16	0.72%
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**Figure 3: Category wise distribution**



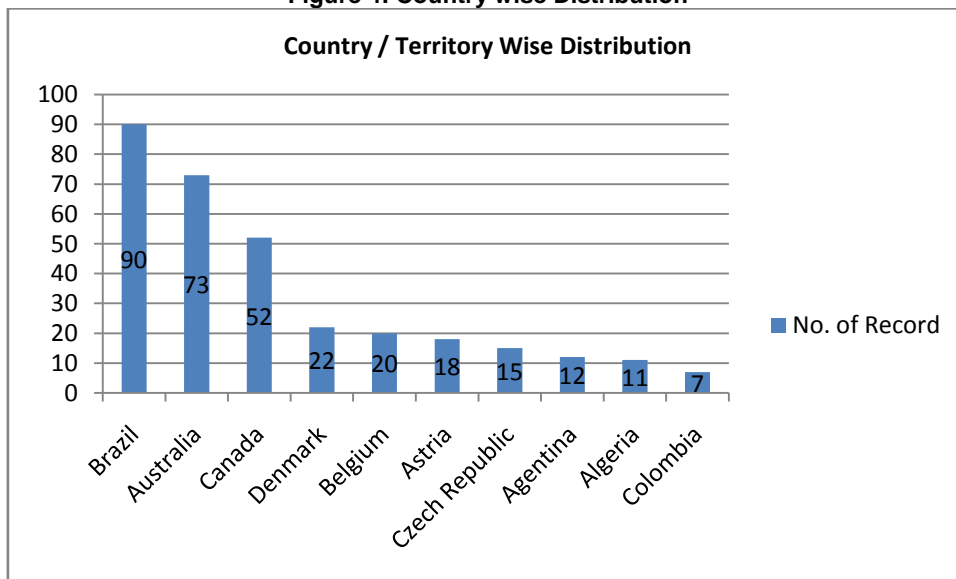
### Country wise Distribution

The country wise distribution said that 71 various countries with 2214 documents in the field of Greenhouse Effect (GE). The Brazil ranked topped with 90 (4.065%) Publications, Australia 73 (3.297%), Canada 52 (2.349%), Denmark 22 (0.994%), Belgium 20 (0.903%), Astria 18 (0.813%), Czech Republic 15 (0.678%), Argentina 12 (0.542%) and So on. The following Table 4 and Figure 4 show the top 10 countries contributions in this field of Greenhouse Effect.

**Table 4: Country wise Distribution**

Sl. No.	Country / Territories	Record	% of 2214
1	Brazil	90	4.065%
2	Australia	73	3.297%
3	Canada	52	2.349%
4	Denmark	22	0.994%
5	Belgium	20	0.903%
6	Astria	18	0.813%
7	Czech Republic	15	0.678%
8	Argentina	12	0.542%
9	Algeria	11	0.497%
10	Colombia	7	0.316%

**Figure 4: Country wise Distribution**



### Research Area wise Distribution

Research Area wise analysis said that, Greenhouse Effect (GE) publications published in 60

Research Areas titles. The highest numbers of publications were in Engineering 571 (25.79%) followed by Energy Fuels 321 (14.50%), Chemistry

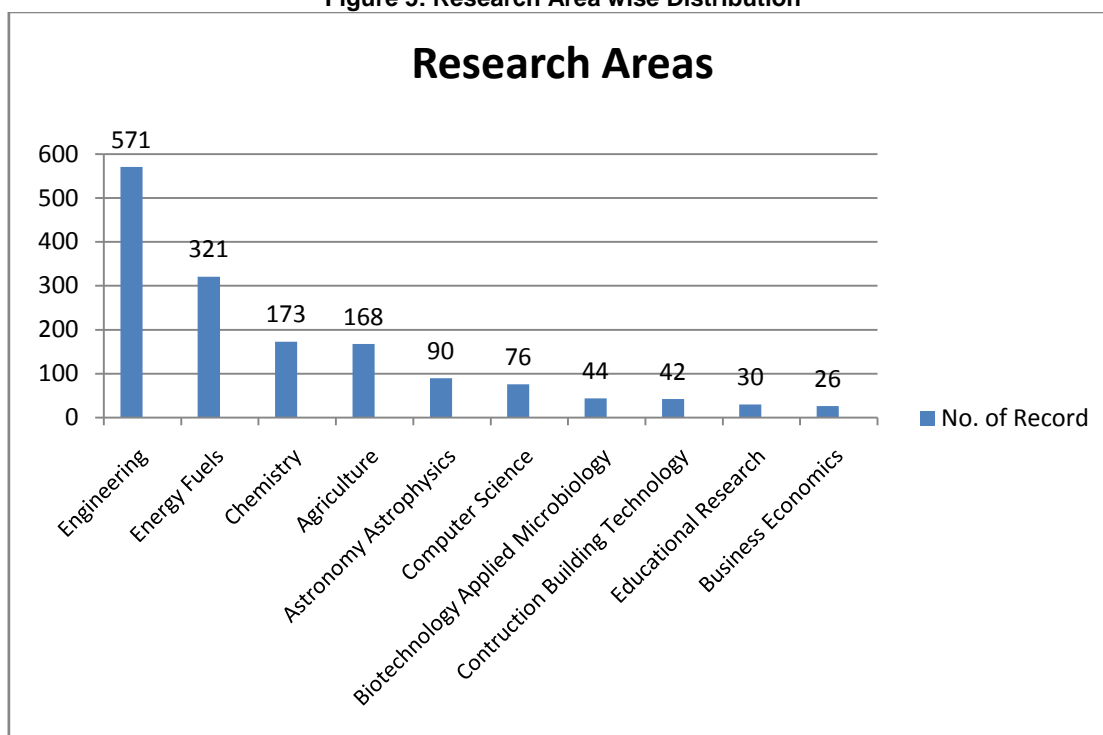
173 (7.81%), Agriculture 168 (7.59%), Astronomy Astrophysics 90 (4.07%) and so on. The following Table 5 and Figure 5 show the top 10 ranking Source Titles during the 18 year period study period.

**Table 5: Research Area wise Distribution**

S. No	Research Area	Record	% of 2214
1	Engineering	571	25.79%
2	Energy Fuels	321	14.50%
3	Chemistry	173	7.81%
4	Agriculture	168	7.59%

5	Astronomy Astrophysics	90	4.07%
6	Computer Science	76	3.43%
7	Biotechnology Applied Microbiology	44	1.99%
8	Construction Building Technology	42	1.90%
9	Educational Research	30	1.36%
10	Business Economics	26	1.17%

**Figure 5: Research Area wise Distribution**



### Language Wise Distribution

The total of 2214 publications in the global parameters, the highest number of publications was in English Language 2077 (93.81%), French 49 (2.21%),

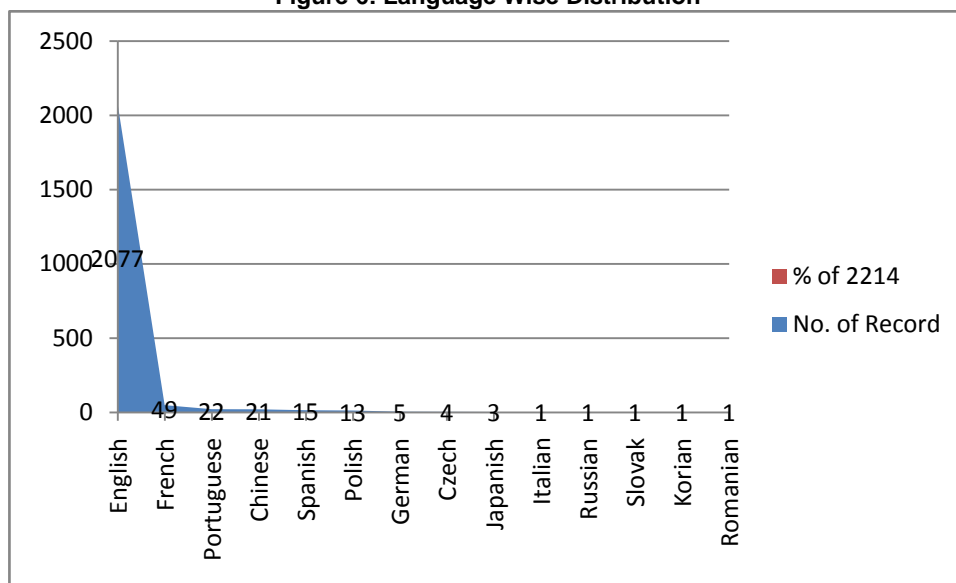
Portuguese 22 (0.99%), Chinese 21 (0.95%), Spanish 15 (0.68%) and so on. (Table 6 and Figure 6 show the Language wise contributions clearly).

**Table 6: Language Wise Distribution**

Sl. No	Language	Record	% of 2214	Cumulative	Cumulative %
1	English	2077	93.81%	2077	93.81%
2	French	49	2.21%	2126	96.03%
3	Portuguese	22	0.99%	2148	97.02%
4	Chinese	21	0.95%	2169	97.97%
5	Spanish	15	0.68%	2184	98.64%
5	Polish	13	0.59%	2197	99.23%
6	German	5	0.23%	2202	99.46%
7	Czech	4	0.18%	2206	99.64%
8	Japanish	3	0.14%	2209	99.77%
9	Italian	1	0.05%	2210	99.82%
10	Russian	1	0.05%	2211	99.86%
11	Slovak	1	0.05%	2212	99.91%
12	Korian	1	0.05%	2213	99.95%
13	Romanian	1	0.05%	2214	100

<b>Total</b>	<b>2214</b>	<b>100</b>		
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**Figure 6: Language Wise Distribution**



**Conclusion**

These research papers have highlighted quantitatively the contributions made by the Greenhouse Effect (GE), as reflected in Web of Science (WOS) database. During 18 years period the Brazil is lead in Greenhouse Effect research publications and Brazil ranked 1st with 90 publications followed by Australia 73 and Canada 52 publication. In the research area wise analysis showed highest numbers of publications were in Engineering 571 (25.79%) followed by Energy Fuels 321 (14.50%), Chemistry 173 (7.81%), Agriculture 168 (7.59%), Astronomy Astrophysics 90 (4.07%). Generally, results of this study revealed that the contribution of Greenhouse Effect (GE) research literature is on continuing rise.

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