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Analysis of Global Research Output in Greenhouse effect: A Scientometric Investigation

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Analysis of Global Research Output in Greenhouse effect: A Scientometric Investigation

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Abstract

This paper covers 18873 publications on Greenhouse effect in global level from the period of 2004-2018. The Scopus international multidisciplinary bibliographical database has been used to identify the Global contributions in the field of Greenhouse effect. The most number of papers were published in the journals as Article, i.e. 11982 (63.49%). Globally, USA is the highest publications country with the contribution of 4172 papers. India is in the ninth position of global level research output with 484 (2.55%) published articles.

Keywords: Scientometrics, Greenhouse Effect, Yearwise Growth, Document type, Prolific Authors, Geographical Analysis, Language wise

Introduction:

The greenhouse effect is a normal process that heats the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space while the rest is absorbed and re-radiated by greenhouse gases. This is the greenhouse effect, which keeps the Earth warm. In the present study, we did the Scientometric analysis of Greenhouse effect with special reference of Scopus database from the period of 2004-2018.

2. Review of Literature

Stanhill, G. (2001) has studied the growth of climate change science based on the increase in the number of abstracts of scientific publications dealing with the many aspects of this broad subject. He observed that the total number of 7000 publications got doubled in every

11 years. The annual rate of publication by single author and number of authors single paper in climate change science, 1.75 and 2.5 respectively, were similar to those for scientific publications in general. Based on the U.S. data, the cost per publishing scientist is very high because of the amount allocated to satellite programs related to climate change research.

Mohanathan, P., & Rajendran, N. (2018) have been analysed the research output in India in the field of Greenhouse Effect during the period of 2001 to 2017 and its data retrieved from SCOPUS Database. During this study period, a total of 568 have been published in India in the field of Greenhouse effect. The study reveals Tiwari, G.N published highest number of papers 21 (3.70%). Document Wise Distribution shows that the highest number of documents were articles 395 with (69.54%) publications. Foreign Countries Contribution in India shows that the United States of America (USA) marked the topped rate of publications with 60 (31.91%).

Hualin Xie et al (2020) conducted this study with selected 739 high-quality references collected from the core database of Web of Science from the period of 1990 to 2019 as well as he conducted a comprehensive scientometrics review by using CiteSpace. It can be found that the quantity has been increasing year by year since 2009, which is closely related to the United Nations Climate Change Conference held in Copenhagen in 2009. It reveals that extracted 19,170 valid references cited in 739 articles all over a period of 30 years. We find that there are few systematic reviews of green finance and most of them are qualitative analysis. This paper recommends to adopts the bibliometrics method for the represention of the overall situation of green finance, hoping to help scholars broaden their research direction.

3.Objectives of this study

The following objectives were formulated for the present study:

- To find out year-wise distribution of publication.
- To examine most productivity authors.
- To analyse language-wise publication.
- To evaluate Geographical distribution of research output.

4. Methodology

This information about the publications has been downloaded from the online Scopus database. 18873 records were obtained for the period of (2004-2018). Ms Excel 2007 was used for analyzing data.

5. Data Analysis and Interpretation

5.1 Year wise publication output of Greenhouse effect

Table 1 & Figure-1 shows the year wise output of Greenhouse effect at global level. This study covers the analysis of research papers published in 15 years during 2004-2018. It is observed that the highest productivity is recorded in 2005 with 1545 (7.61%) of the publications. It is followed by 1445 (7.66%) of the publications in 2018 whereas the least number of publications were in 2012 with only 968 (5.13%).

Table-1 Year wise publication output of Greenhouse effect

S. No	Year	Publications	Percentage	Cumulative	Cumulative %
1	2004	1436	7.61	1436	7.61
2	2005	1545	8.19	2981	15.80
3	2006	1302	6.90	4283	22.69
4	2007	1185	6.28	5468	28.97
5	2008	1237	6.55	6705	35.53
6	2009	1347	7.14	8052	42.66
7	2010	1030	5.46	9082	48.12
8	2011	1056	5.60	10138	53.72
9	2012	968	5.13	11106	58.85
10	2013	1279	6.78	12385	65.62
11	2014	1190	6.31	13575	71.93
12	2015	1293	6.85	14868	78.78

S. No	Year	Publications	Percentage	Cumulative	Cumulative %
13	2016	1259	6.67	16127	85.45
14	2017	1301	6.89	17428	92.34
15	2018	1445	7.66	18873	100
	Total	**18873**	100		

Figure-1 Literature Growth of Publications

6.2 Distribution of Document Types of Papers

Table 2 shows the Document wise classification of the papers published during the period 2004-2018. The most number of papers were published in the journals as Article, i.e. 11982 (63.49%) followed by another document type, i.e. Conference paper 1854 (9.82%). The least preferred document choice for publication of single paper 0.01% published as an Abstract Report, Data Paper and Retracted.

Table-2 Distribution of Document Types of Papers

Document Type	Publications	Percentage
Article	11982	63.49
Conference Paper	1854	9.82
Review	1655	8.77
Note	1136	6.02
Editorial	734	3.89
Short Survey	681	3.61
Letter	482	2.55
Book Chapter	272	1.44
Book	45	0.24
Conference Review	16	0.08
Erratum	7	0.04
Business Article	2	0.01
Abstract Report	1	0.01
Data Paper	1	0.01
Retracted	1	0.01
Undefined	4	0.02
Total	**18873**	**100**

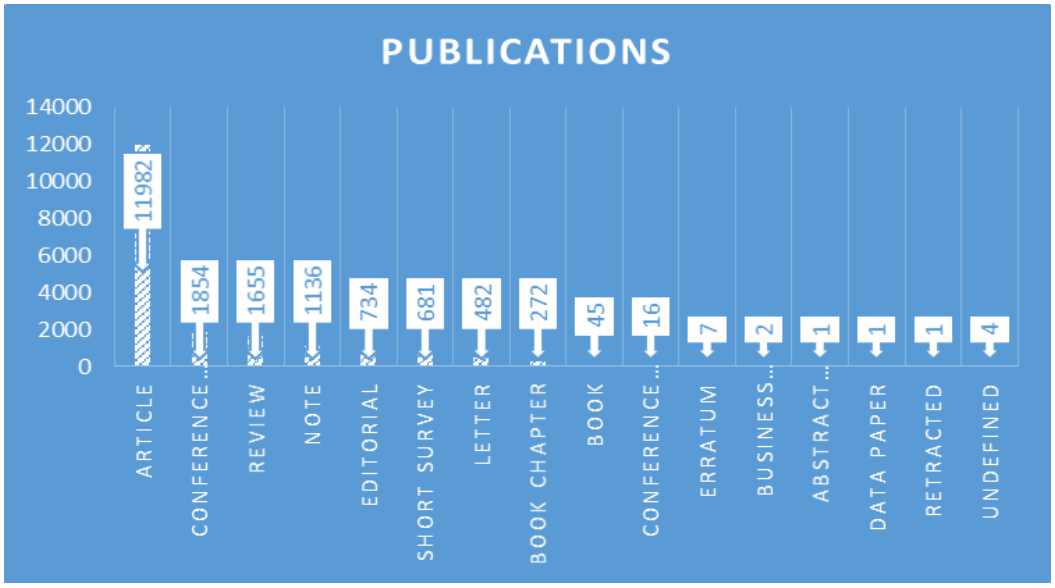

Figure-2 Distribution of Document Types of Papers

6.3 Most Prolific Top 10 Authors

A total of 11238 authors contributed 18873 publications of Greenhouse effect from 2004-2018. Out of the total 18873 publications, Wang Y with 34(0.24%) research papers topped the rank, followed by Liu Y and Zhang Y contributing 30 (0.21%) and 22 (0.16%) publications hold second and third rank respectively.

Table-3. Top 10 Most Prolific Authors

S. No	Author	Contributions	Percentage	Ranking
1	Wang Y	34	0.24	1
2	Liu Y	30	0.21	2
3	Zhang Y	22	0.16	3
4	Zhang X	21	0.15	4
5	Wang J	20	0.14	5
6	Zhang J	20	0.14	5
7	Li X	17	0.12	6
8	Li Y	15	0.11	7
9	Wang L	15	0.11	7
10	Chen J	14	0.10	8

6.5 Geographical Analysis of Documents

The top 10 most collaborating countries with publication of Greenhouse effect during 2004 – 2018 are shown in Table-6. It is found that the overall 22.11 of publications published from Unted states of America and ranked first. Out of 137 coutries, India is the 9th place with 2.55 % papers published.

Table 5: Geographical Analysis of Documents

S. No	Country	Publications	World's Share Percentage
1	United States	4172	22.11
2	China	1776	9.41
3	England	1282	6.79
4	Canada	711	3.77
5	Australia	688	3.65
6	Germany	680	3.60
7	France	557	2.95

S. No	Country	Publications	World's Share Percentage
8	Spain	490	2.60
9	India	481	2.55
10	Japan	467	2.47

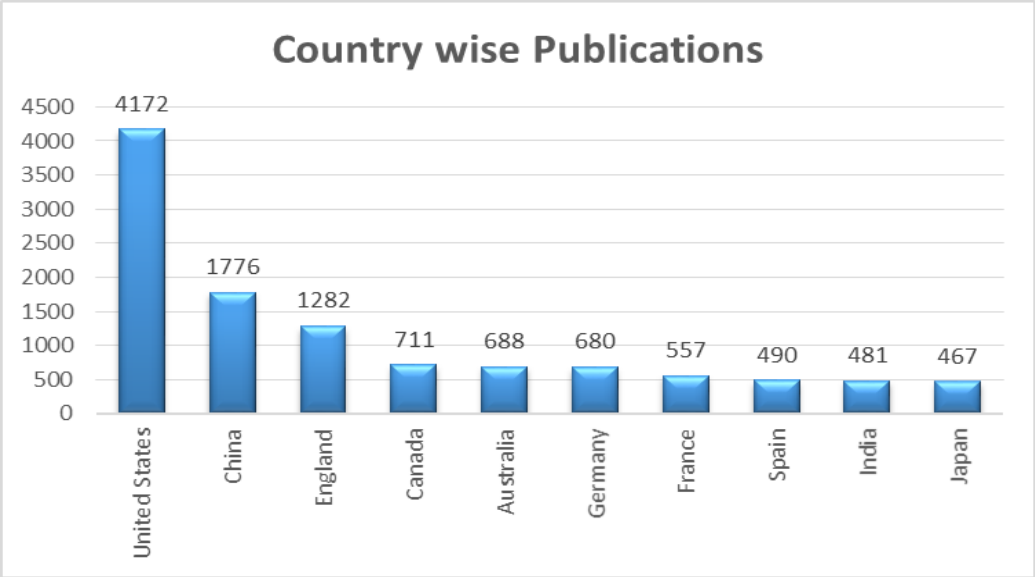

Figure 3: Geographical Analysis of Documents

6.6 Language wise Research Output

Table 5 observed the language wise publications of Greenhouse effect research output during the study. Out of 18873 publications, about 17632 papers appeared in English, followed by 490 published in Chinese and 121 publication from French. It can be found that language wise distribution of Greenhouse effect publications shows that English language is the highest productivity. It could be observed that highest portion of 93.42 % of publications of Greenhouse effect was published in English language.

Table 6: Language wise Research Output

S. No	Language	Publications	Percentage
1	English	17632	93.42
2	Chinese	490	2.60
3	French	121	0.64
4	German	68	0.36

S. No	Language	Publications	Percentage
5	Spanish	59	0.31
6	Portuguese	55	0.29
7	Japanese	34	0.18
8	Russian	34	0.18
9	English; Portuguese	20	0.11
10	Polish	19	0.10

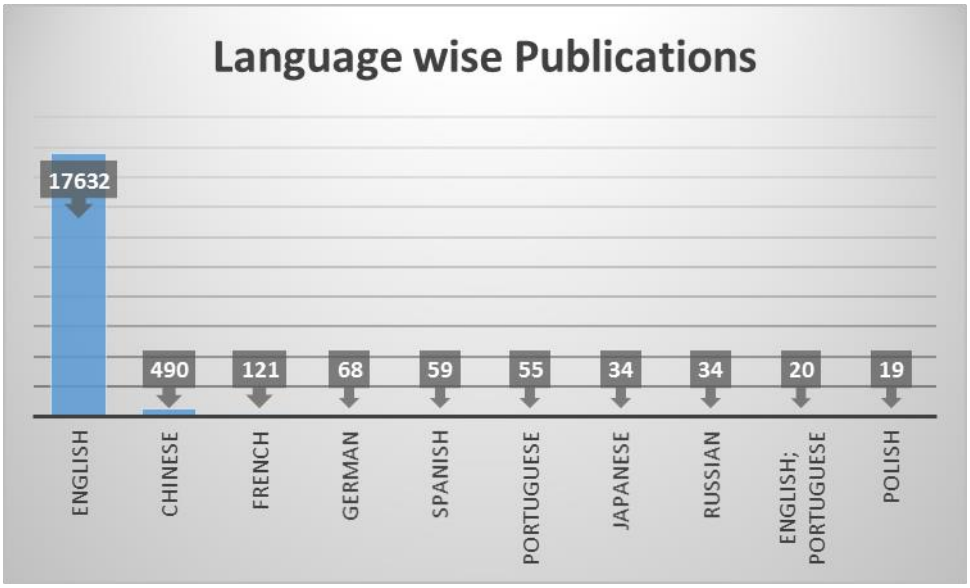

Figure 4: Language wise Research Output

7. Conclusion:

The research output of Greenhouse effect at Global level during the period of 2004-2018 brought about 137 countries with 18873 publications. The highest research output of Greenhouse effect was contributed by USA. India is the ninth position of global level research output. The literature growth pattern shows that the scholarly publication is growing in a linear pattern and 11982 (63.49%) of the total research output was most published as a journal article. Now- a- days Greenhouse effect is very important environmental issue, so government and non- government organizations should give importance to Greenhouse effect research. There is also a need to encourage and motivate a collaborative research of Greenhouse effect.

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