Research Article

A Global Research Productivity of Green Marketing: A Scientometric Study

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ABSTRACT

The term "Green marketing" has been used as a search keyword in the global indexing database 'Web of Science' a core collection which is initially published by the Institute for Scientific Information founded by the international information scientist Eugene Garfield. It is found from the study that there are 7178 scholarly publications. The different scientometric indicators, year wise, document types, Author productivity, highly cited journals, highly productive institutions, three fields' plots, highly cited countries, and Country collaboration map. The highest number of publications was produced in the year 2019 with 997 documents; the value of h-index was high in the year 2013 with 86 counts and articles are the highest with 6300 the highest h-index was found by the author Wang J and The highest value of h-index 86 were produced by journal of cleaner Production and 135 g-index and highly productive institutions were Hong Kong Polytechnic University with 65 (1%) publications and received 5798 citations and the top three writers, namely Dangelico RM, Sarkis JS, and Chen YS. The top three subject areas, sustainability, green marketing, and sustainable development, and the top 20 cited references lead to 3095 citations authored by Fornell C (1981) secured the highest citations (307) and the highest article contributed with the USA 1416 and the highest h-index with Canada 36, From China to the USA collaboration with 142 times.

Keywords: Green Marketing, Three field plots, Scientometric, Research publication, Environmental marketing, Ecological marketing.

INTRODUCTION

The term "green marketing," also known as "ecological marketing" or "environmental marketing," refers more specifically to the promotion of environmentally friendly goods, services, and initiatives. Green marketing encompasses a wide range of environmentally friendly practices and strategies, some of which are as follows: Utilizing recycled-material eco-friendly product packaging reducing the production-related emissions of greenhouse gases, using environmentally friendly business methods, marketing initiatives highlighting a product's environmental advantages. Profits can be put toward carbon offsetting or renewable energy projects.

LITERATURE REVIEW

It is to mention that the previous review of literature using Bibliometric and Scientometrics studies carried out on green marketing, green product and green innovations. Subject using the science citation expanded database but not highlighted the

citation scores in terms of total local citation score and total global citation score as of the present study.

Saleem *et al.* (2021) analyzed on green marketing through a bibliometric study of articles published from 1977 to 2020, and to analyze and present the results from the perspective of growing trends in the field productive and influential countries, institutions, authors, articles and research journals keywords authorship patterns and international collaborations. The study results indicate a gradual increase in green marketing research from 1977 to 2020, more so in the last five years. A total of 2025 scholarly documents were published in 634 journals during this period and listed in the Web of Science (WoS) the top 10 most productive countries were then analyzed. A great number of institutions from both developing countries and developed countries were compared. Finally, based on keywords of environment marketing and sustainable marketing have attracted extensive attention during the past decade through the abundance of published literature on the topic. However, there is still a lack of comprehensive and systematic research focusing on the evolution of this field.

Bhardwaj *et al.* (2020) Investigated that green products are used commonly to describe the products that seek to protect or enhance the environment during production use or disposal by

conserving resources and minimizing the use of toxic agents, pollution, and waste. Hence, green products offer potential benefits to the environment and human health. Therefore, environmentally conscious consumers have shown an enhanced inclination for their consumer preferences, and environmental activism, and stringent regulations have forced sustainability-oriented firms to shift their focus to producing green products. The present study uses bibliometric tools and various indicators to discern research progress in the field of green products over the period 1964-2019. Further, VoS viewers software is applied to map the main trends, a total of 1619 publications during the study period were extracted from the SCOPUS database using different keywords related to the green products. The data analysis indicates that the field of green products has experienced significant growth since 1964, especially in the last 14 years. In terms of publications and citations, the United States is the leading country. The field of research concerning green products has evolved the early debate on sustainable design, green marketing, sustainable development and sustainability. The topic seems to be advancing into a variety of green themes related to consumer trust and purchase intentions, branding and loyalty and environmental and health consciousness.

Albert *et al.* (2017), reported that green innovation has increasingly attained organizational relevance due to its contribution to the satisfaction of environmental needs while concurrently enabling companies to differentiate themselves from their competitors, and hence attain sustainable competitive advantages. In this context, we conducted a detailed analysis of 618 papers on green innovation from the web of science database for the 1971-2015 periods. This paper develops a bibliometric analysis with the aim of assessing the key papers in the field and identifying the most substantive contributions to the literature.

SIGNIFICANCE OF THE STUDY

As there is no study exclusively on global research product of green marketing, particularly by analysing the records from the web of Science database, which is the top indexing and citation database, the present study aimed at highlighting the proliferation of publications on the source, geographical region, the citations, and three field plots, collaboration country map during the study period. It is also significant that the presenters highlighted the impact of authors and the sources where the research

OBJECTIVE OF THE STUDY

The specific objectives of the study are:

To study the year-wise publication of articles published in green marketing research output.

To analysis the document-wise research output;

To find out the Author productivity, journal, institution, three field plots, and block research publication;

To find out the most locally cited references and highly cited countries;

Identifying country-wise research outcomes of green marketing research.

METHODOLOGY

The publication emphasis of green marketing is carried out from 2006 to 2021 in this study. During the period of study 7178 articles on green marketing was published globally in various research journals. It is a descriptive study that aimed at analysing the research output on the search term used "green marketing" or "Ecological marketing "or "Environmental marketing" as phrase search in the Science Citation Index Expanded, Social Science Citation Index, Arts and Humanities Citation Index. The document was downloaded and analysed using the tools His Cite, Bib Excel, and Biblioshiny for Bibliometrics.

ANALYSIS AND INTERPRETATION

Year-wise Distribution of Green Marketing Research Publication Outcome

It is found from the data on publications as indexed by Web of Science on Green Marketing has 7178 publications. The number of papers published from 2006 to 2021 in the sixteen years green marketing keywords selected for this study is presented in Figure 1 depicts the year-wise growth of research publications on green marketing over the selected periods. The highest number of publications was produced in the year 2019 with 997 documents and the least number of publications appeared in the year 2021 with 17 documents. The value of *h*-index was high in the year 2013 with 86 counts followed by 82 in the year 2012 and shows the lowest *h*-index value of 7 in the year 2021.

Document types

As like any other research outcomes, green marketing output also documented in thirteen formats of scholarly communication. Of which, journal articles are the highest with 6300 which is followed by reviews 561 articles, proceedings papers 158, and so on. The majority of literature appeared in scholarly journals by means of which they disseminate their research findings.

Authors' productivity

There are 18920 authors who contributed 7178 publications across the globe on green marketing research. Table revealed that there are no dominant authors as the records were distributed scattered, the top contributor has only 20 records by Wang J.

* TLCS: Total Local Citation Score,

* TLCS/t: Total Local Citation Score per year,

* TLCSx: Total local citation Score Excluding self-Citation,
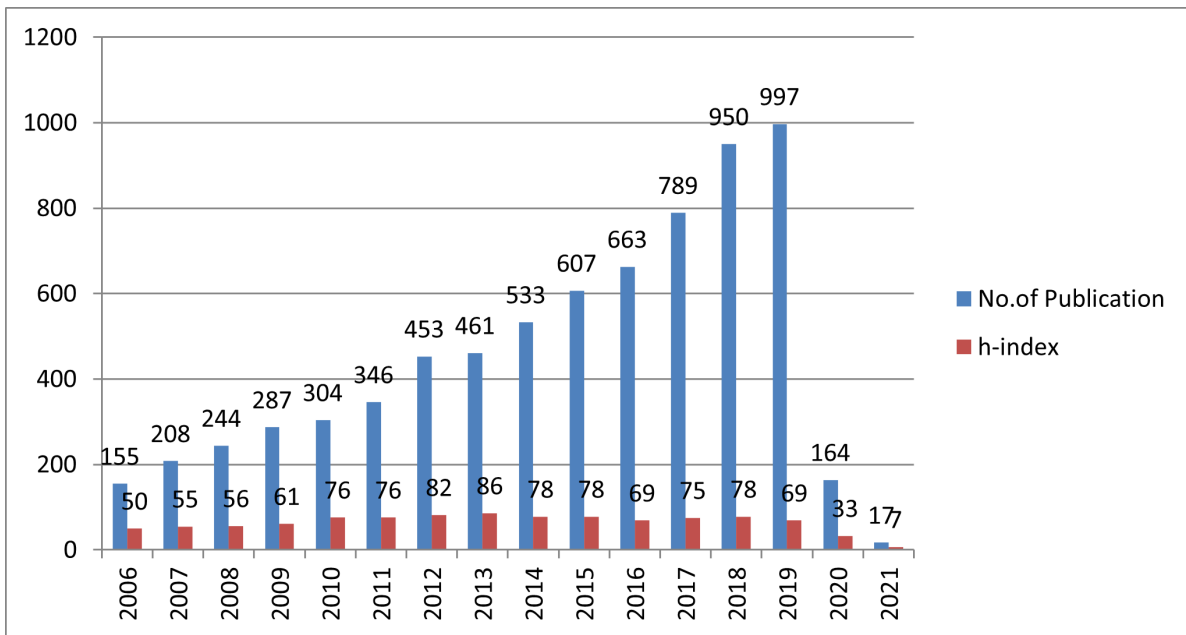
* TGCS: Total Global Citation Score,
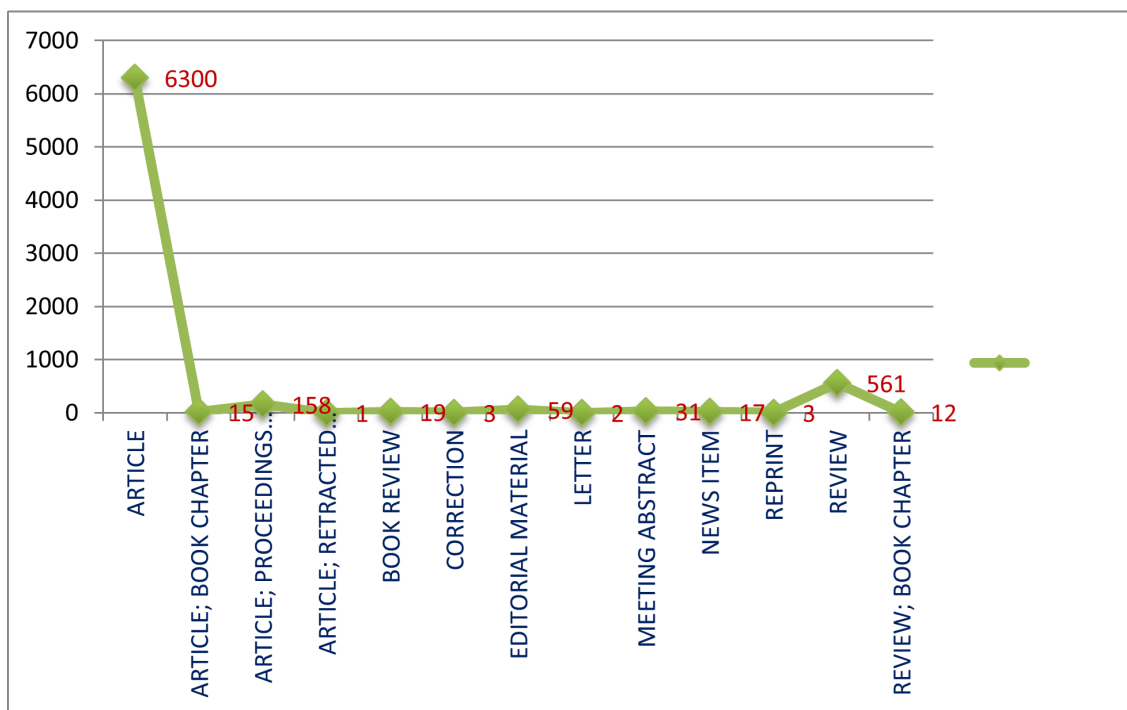
Figure 1: Year-wise Publications with *h*-index.

Figure 2: Document-wise Distribution of Green Marketing Publications.

*TGCS/t: Total Global Citation Score per year,

* TLCR: Total Local Citation Score reference,

* TLCSb: Total Local Citation Score in the Beginning,

* TLCSe: Total Local Citation Score in the end.

Highly Cited Prolific Journals

Figure 3 depicts the journal wise indexes of research publication of green marketing over the top 10. The highest value of *h*-index

86 was produced by the journal of cleaner Production and 135 *g*-index and the least value of *h*-index 26 was produced by the international journal of production economics and environmental and resource economics least value of *g*-index 31.

Highly Productive Institutions

Among the institutions, highly productive institutions were Hong Kong Polytechnic University with 65 (1%) publications and received 5798 citations followed by University of Florida with

Table 1: Top 20 Authors Publication.

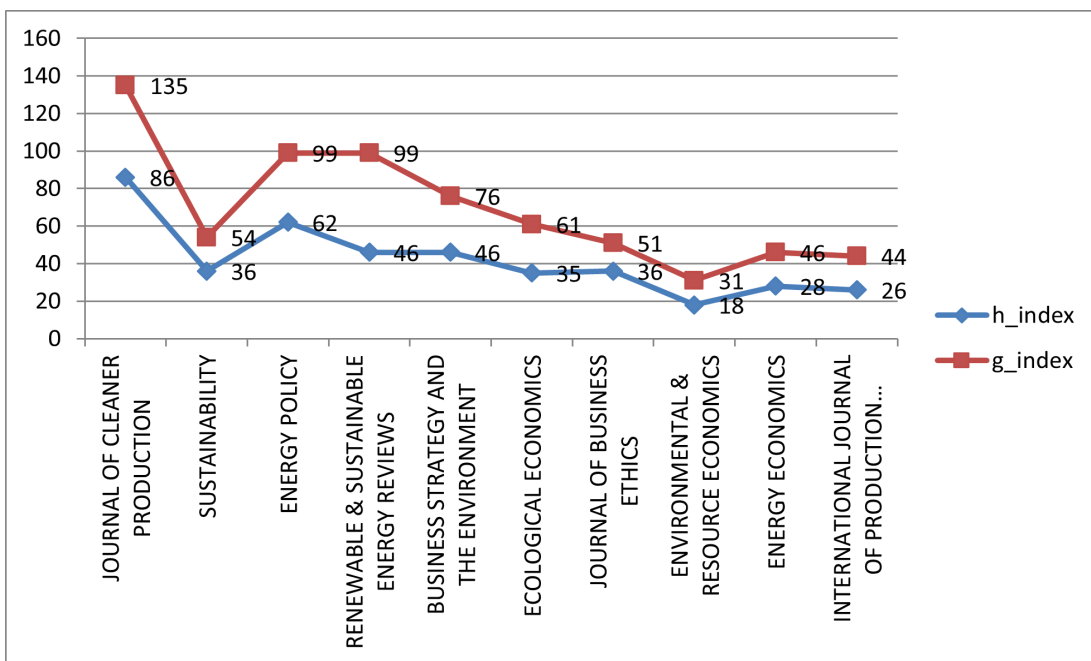| Sl. No	Author	No. of Articles	%	TLCS	TLCS/t	TLCSx	TGCS	TGCS/t	TLCR	TLCSb	TLCSe
1	Wang J	20	0.3	8	1.05	7	991	159.36	11	0	
2	Zhang L	19	0.3	45	6.68	39	863	126.96	103	13	
3	Liu Y	16	0.2	6	1.01	4	335	55.9	16	4	
4	Sarkis J	15	0.2	200	16.87	185	2764	262.07	48	15	10
5	Li Y	13	0.2	6	0.96	6	346	56.35	31	4	
6	Wu J	13	0.2	51	6.25	39	544	90.58	60	6	
7	Zhang Y	13	0.2	6	0.85	4	921	142.66	34	2	
8	Zhang Q	12	0.2	6	1.35	4	344	78.67	33		
9	Zhou Y	12	0.2	24	4.4	17	462	78.35	41	3	
10	Chen YS	11	0.2	226	20.34	202	1855	181.64	28	25	29
11	Li J	11	0.2	12	1.54	11	302	46.91	19	3	
12	Li L	11	0.2	0	0	0	808	172.51	2	0	
13	Wang Y	11	0.2	0	0	0	187	46.33	28	0	
14	Kim H	10	0.1	5	0.64	5	405	56.06	4	2	
15	Lai KH	10	0.1	128	9.24	113	1616	133.15	37	10	3
16	Testa F	10	0.1	35	4.79	26	576	97.4	52	12	
17	Toppinen A	10	0.1	13	1.66	10	422	55.6	22	6	1
18	Wang H	10	0.1	5	0.69	3	183	34.24	16	2	
19	Wang L	10	0.1	5	0.52	5	502	91.64	6	1	
20	Chen X	9	0.1	11	1.57	7	361	68.98	27	7	

Figure 3: Top 10 Prolific Highly Cited Journals.

Table 2: Top 10 Highly Productive institutions.

Sl. No.	Institution	No. of Publications	%	TLCS	TGCS
1	Hong Kong Polytechnic University.	65	1	390	5798
2	University of Florida.	57	0.8	47	1711
3	Chinese Academy of Science.	50	0.7	52	1988
4	Michigan State University.	47	0.7	99	2564
5	University of California, Berkeley.	43	0.6	196	3937
6	University of Illinois.	39	0.6	67	2213
7	Texas A and M University.	38	0.6	63	1319
8	University of British Columbia.	36	0.5	94	2847
9	Cornell University.	35	0.5	61	1876
10	National University of Singapore.	35	0.5	89	2480

57(0.8%) publications and 1711 citations, Chinese Academy of Science with 50(0.7%) publications and 1988 citations. The study found that 3 institutions recorded more than 50 publications each, 7 institutes with below 50 publications each.

Three-Field Plots

The published literature on green marketing is shown in Figure 4 with an emphasis on the connections between the most popular authors, sources, and keywords. The analysis's findings revealed the top green marketing researchers, preferred publishing sources, and subfields of the field. Five sub-areas, including green marketing, China, environmental sustainability, sustainability, and sustainable development, were closely related to the top three writers, namely Dangelico RM, Sarkis JS, and Chen YS. Additionally, these authors preferred to publish in three sources, including that of the International Journal of Production Economics, Sustainability, Business Strategy, and Journal of Cleaner Production.

Keywords, Sources and Countries

Figure 5 shows that the relationship among subject areas keywords sources, and countries on green marketing research. The top three subject areas, sustainability, green marketing, sustainable development, had a relationship with five sources, Journal of Cleaner Production, Sustainability, Energy Policy, Renewable and Sustainable Energy Reviews, Business Strategies and the Environment. Furthermore, these subject areas had a strong relationship with the top two most productive countries the USA and China.

Highly Cited References

Table 3 depicts the top 20 highly cited references of green marketing. The top 20 cited references lead to 3095 citations. Authored by Fornell C (1981) secured highest citations (307), followed by Porter ME (1995) with 241 citations, and Porter ME (1995) with 224 citations.

Highly Cited Countries

Country-wise distribution of research publications on green marketing revealed that 130 nations carried out green marketing research. Top ten nations contributed 4461 articles. The highest number of articles is contributed by the USA contributing 1416 articles, followed by China contributing 798 articles. India is in seventh position with 243 articles. Last position is secured by Brazil with 218 articles. Canada secured the highest h-index with 36, followed by the UK with 27 h-index.
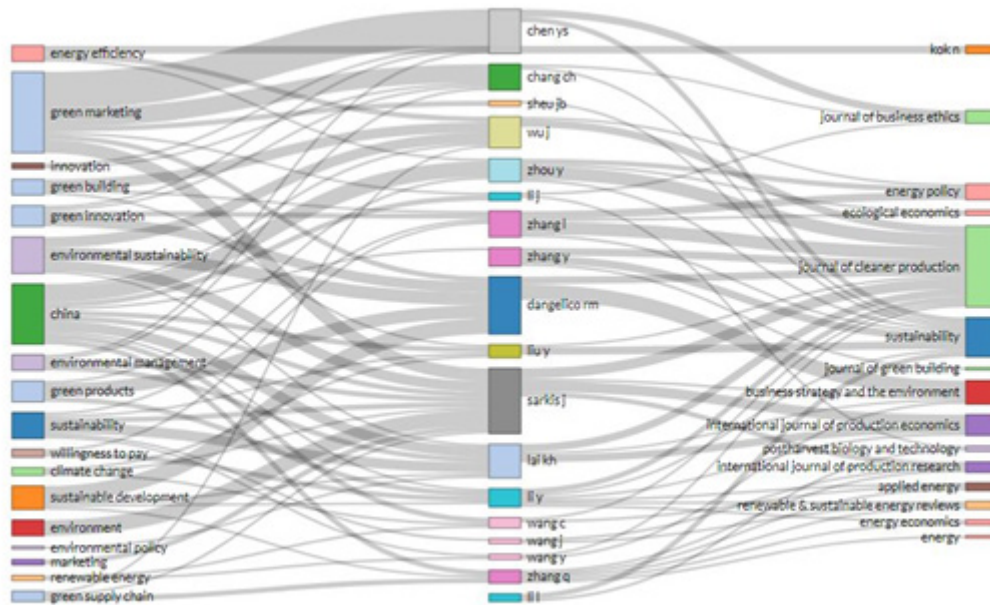
Figure 4: Relationship between authors (Middle), sources (Left) and keywords (Right) based on three-field plots.
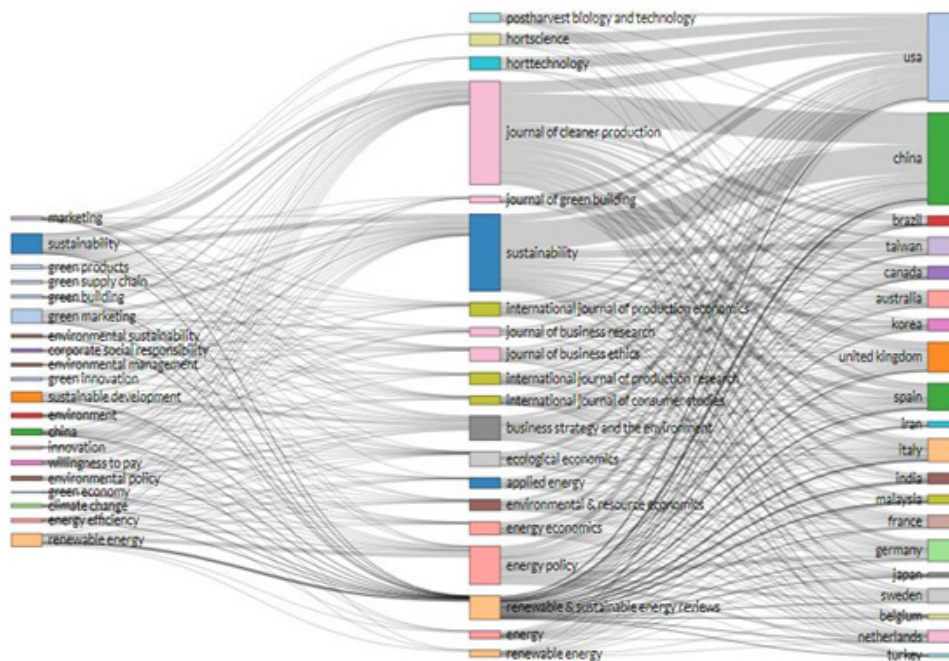

Figure 5: Three field plots of the relationship among keywords (left) Source (Middle) and Countries (Right).

Country Collaboration Map

Figure 7 shows the county collaboration map on green marketing literature. China and the USA collaborated 142 times and followed by collaborations between China and Australia with 57 collaborations. Several collaborations were found on the country collaboration map.

FINDINGS

The main aim of this study is to investigate the publication output of green marketing for the last two decades as reflected in the Web of Science (WoS) database. From the analysis it is found that there is an increasing trend of contributing research output with collaboration at global levels. Following are the major findings of the present study:

Table 3: Top 20 Cited References.

Cited References	Citations
Fornell C, 1981, J Marketing Res, V18, P39, Doi 10.2307/3151312.	307
Porter Me, 1995, Harvard Bus Rev, V73, P120.	241
Porter Me, 1995, J Econ Perspect, V9, P97, Doi 10.1257/Jep.9.4.97.	224
Hart Sl, 1995, Acad Manage Rev, V20, P986, Doi 10.2307/258963.	206
Laroche M, 2001, J Consum Mark, V18, P503, Doi 10.1108/Eum0000000006155.	194
Ajzen I, 1991, Organ Behav Hum Dec, V50, P179, Doi 10.1016/0749-5978(91)90020-T.	174
Russo Mv, 1997, Acad Manage J, V40, P534, Doi 10.2307/257052.	167
Podsakoff Pm, 2003, J Appl Psychol, V88, P879, Doi 10.1037/0021-9010.88.5.879.	155
Bansal P, 2000, Acad Manage J, V43, P717, Doi 10.2307/1556363.	140
[Anonymous], [No Title Captured].	137
Menon A, 1997, J Marketing, V61, P51, Doi 10.2307/1252189.	132
Zhu Qh, 2004, J Oper Manag, V22, P265, Doi 10.1016/J.Jom.2004.01.005.	118
Barney J, 1991, J Manage, V17, P99, Doi 10.1177/014920639101700108.	117
Klassen Rd, 1996, Manage Sci, V42, P1199, Doi 10.1287/Mnsc.42.8.1199.	117
Roberts Ja, 1996, J Bus Res, V36, P217, Doi 10.1016/0148-2963(95)00150-6.	116
Straughan Rd, 1999, J Consum Mark, V16, P558, Doi 10.1108/07363769910297506.	116
Chen Ys, 2006, J Bus Ethics, V67, P331, Doi 10.1007/S10551-006-9025-5.	113
Anderson Jc, 1988, Psychol Bull, V103, P411, Doi 10.1037/0033-2909.103.3.411.	111
Ambec S, 2008, Acad Manage Perspect, V23, P45, Doi 10.5465/Amp.2008.35590353.	105
Diamantopoulos A, 2003, J Bus Res, V56, P465, Doi 10.1016/S0148-2963(01)00241-7.	105
N ≥105 N=No. Of Citations.	

It is observed that the year-wise growth of research publications of green marketing over the selected periods. The highest number of publications was produced in the year 2019 with 997 documents and the least number of publications appeared in the year 2021 with 17 documents. The value of h-index was high in the year 2013 with 86 counts followed by 82 in the year 2012 and shows the lowest h-index value of 7 in the year 2021.

It is found that journal articles are the highest with 6300 which is followed by reviews 561 articles, proceedings papers 158, and so on. The majority of literature appeared in scholarly journals by means of which they disseminate their research findings.

It is found that there are 18920 numbers of authors who contributed 7178 publications across the globe on green marketing research. The Table revealed that there are no dominant authors as the records were distributed scattered, top contributor has only 20 records by Wang J.

It is observed that the journal wise indexes of research publication of green marketing over the top 10. The highest value of h-index 86 was produced by journal of cleaner Production and 135 g-index and the least value of h-index 26 was produced by international journal of production economics and environmental and resource economics least value of g-index 31.

It is observed that highly productive institutions were Hong Kong Polytechnic University with 65 (1%) publications and received 5798 citations followed by University of Florida with 57(0.8%) publications and 1711 citations, Chinese Academy of Science with 50(0.7%) publications and 1988 citations. The study found that 3 institutions recorded more than 50 publications each, 7 institutes with more than below 50 each publication.

It is found that the most popular authors, sources, and keywords. The analysis's findings revealed the top green marketing researchers, preferred publishing sources, and subfields of the field. Five sub-areas, including green marketing, China, environmental sustainability, sustainability, and sustainable development, were closely related to the top three writers, namely Dangelico RM, Sarkis JS, and Chen YS. Additionally, these authors preferred to publish in three sources, including that of the international journal of production economics, sustainability, business strategy, and journal of cleaner production.

It is found that the relationship among subject areas keywords sources, and countries on green marketing research The top five subject areas, sustainability, green marketing, sustainable development, renewable energy, had a relationship with five sources, Journal of cleaner production, sustainability, energy policy, renewable and sustainable energy reviews, business strategies and the environment. Furthermore, these subject
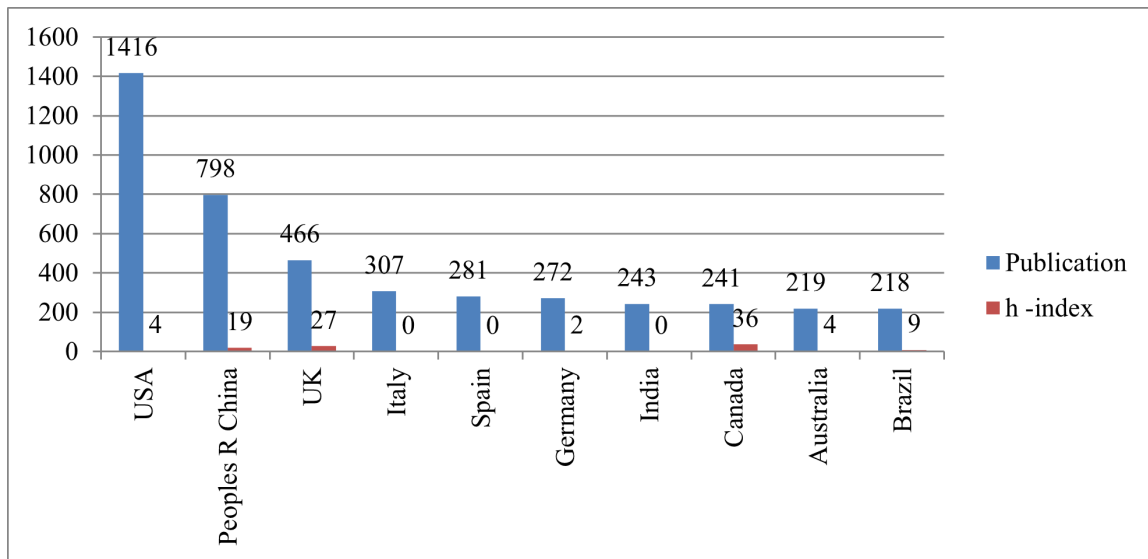
Figure 6: Country wise distribution of publications.

Figure 7: Country Collaboration Map.

areas had a strong relationship with the top two most productive countries USA and China.

It is observed that the top 20 cited references lead to 3095 citations. Authored by FORNELL C, 1981 secured highest citations (307); followed by PORTER ME, 1995, securing 241 citations. It is noted that the list of respectively cited references is dominated by two journals.

It is observed that the country wise distributions of research publications on green marketing revealed that 130 numbers of global nations carried out green marketing research. Top ten global nations contributed 4461 number of articles. The highest article contributed with the USA 1416, followed by China contributing 798. India is in seventh position with 243. Last

position Brazil with 218. The highest *h*-index with Canada 36 followed by the UK 27 *h*-index.

It is found in the county collaboration map on green marketing literature. From China to USA collaboration with 142 times and followed by China from Australia collaboration with 57 times. There are several collaborations found on the country collaboration map.

CONCLUSION

This present study made an attempt to trace out the publication output of Green Marketing from 2006 to 2021 as reflected in the Web of Science (WoS) Core collection database and assess its growth, nature of collaboration and the research impact in terms

of various scientometric parameters. Researchers have observed a consistent growth of research output throughout the selected period of study and over the past 16 years, there has been a remarkable increase in the research output of Green Marketing. The analysis was undertaken to gain a better and comprehensive understanding of the recent research publications of green marketing. Most of the publications are published in articles. Conference proceedings, review books and so on. Further major portion of the publications during this period belongs to the journal of cleaner production, Sarkis J, Hong Kong Polytechnic University. Green Marketing had a better collaboration with foreign countries and the publications appeared at different levels. This present study provides an indication of current *h*-index of green marketing research publication patterns and its citation analysis of green marketing and helps the researchers and faculties to analyze the *h*-index publication trends in their respective areas.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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