GREEN HUMAN RESOURCE MANAGEMENT BIBLIOMETRIC ANALYSIS OF THE PUBLISHED LITERATURE FROM 2008 TO 2022

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ARTICLE INFO	ABSTRACT
	Purpose: The rising amount of research being done in the realm of environmental protection has resulted in the establishment of a new research paradigm in the field of human resource administration (HRA) called green human resource management" (GHRM). The current study was conducted to highlight the work been done in the field of GHRM and provide a pictorial view to the readers to understand the effectiveness of GHRM in various organizations. **Theoretical framework:** This paper provides an explanation of the development of literature and makes it possible to comprehend the topics that have been investigated in previous works of literature regarding GHRM. **Design/methodology/approach:** The Scopus core-collection and VOS-viewer were utilized in the writing of this paper. For the purpose of the study, each and every GHRM related document that will already exist within the database between 2008 till 2022 will be analyzed. The display of the data via graphical visualization incorporates both bibliographic coupling and co-citation features into the presentation. **Findings:** It was discovered that 418 documents on the GHRM scholarship were evaluated in this bibliometric investigation. The purpose of this study was to examine the volume, rising tendency, worldwide distribution, major journals, pioneer authors, dominant countries, and dominant industries in the field of global human resource management. With the use of logical operators, six different word combinations were combined to create the final product, "TITLE-ABS-KEY ("green human resource management" OR "green hr" OR "green human resource" OR " green human resource practices" OR "GHRM" OR "GHRMP")", thus, the range grows wider. In the review, it was found that the GHRM is still a new idea. This review is meant to help modern researchers by giving them an overview of the current state of things.

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Research, Practical & Social implications: A more thorough and objective knowledge structure evolution framework for the period 2008 to 2022 is provided by this research, which is useful to the evolution of the Human Resource Management field.

Originality/value: We have added a global perspective to our understanding of the concept's evolution across time by weaving together bibliographic information and network diagrams in this paper.

GESTÃO VERDE DE RECURSOS HUMANOS ANÁLISE BIBLIOMÉTRICA DA LITERATURA PUBLICADA DE 2008 A 2022

RESUMO
Objetivo: A crescente quantidade de pesquisa que está sendo feita no campo da proteção ambiental resultou no estabelecimento de um novo paradigma de pesquisa no campo da administração de recursos humanos (HRA) chamado "Green Human Resource Management" (GHRM). O estudo atual foi realizado para destacar o trabalho realizado no campo da GHRM e fornecer uma visão pictórica aos leitores para entender a eficácia da GHRM em várias organizações.
Estrutura teórica: Este trabalho fornece uma explicação do desenvolvimento da literatura e possibilita a compreensão dos tópicos que foram investigados em trabalhos anteriores da literatura sobre GHRM.
Design/metodologia/abordagem: A coleção de núcleos Scopus e o visualizador de VOS foram utilizados na redação deste artigo. Para o propósito do estudo, todo e qualquer documento relacionado à GHRM que já exista dentro do banco de dados entre 2008 e 2022 será analisado. A exibição dos dados através da visualização gráfica incorpora tanto o acoplamento bibliográfico quanto os recursos de co-citação na apresentação.
Conclusões: Foi descoberto que 418 documentos sobre a bolsa da GHRM foram avaliados nesta investigação bibliométrica. O objetivo deste estudo foi examinar o volume, a tendência crescente, a distribuição mundial, as principais revistas, os autores pioneiros, os países dominantes e as indústrias dominantes no campo da gestão global de recursos humanos. Com o uso de operadores lógicos, seis combinações diferentes de palavras foram combinadas para criar o produto final, "TITLE-ABS-KEY ("gestão de recursos humanos verde" OU "hr verde" OU "práticas de recursos humanos verde" OU "GHRM" OU "GHRMP")", assim, a gama cresce mais. Na revisão, descobriu-se que o GHRM ainda é uma idéia nova. Esta revisão visa ajudar os pesquisadores modernos, dando-lhes uma visão geral do estado atual das coisas.
Pesquisa, implicações práticas e sociais: Uma estrutura mais completa e objetiva de evolução da estrutura do conhecimento para o período de 2008 a 2022 é fornecida por esta pesquisa, que é útil para a evolução do campo da Gestão de Recursos Humanos.
Originalidade/valor: Acrescentamos uma perspectiva global à nossa compreensão da evolução do conceito ao longo do tempo, tecendo em conjunto informações bibliográficas e diagramas de rede neste trabalho.

Palavras-chave: Gestão de Recursos Humanos Verdes, GHRM, Análise Bibliométrica, Scopus, Vosviewer, Wordsift, Os Harzing's Publicam ou Perecem.

GESTIÓN DE RECURSOS HUMANOS VERDES ANÁLISIS BIBLIOMÉTRICO DE LA LITERATURA PUBLICADA DE 2008 A 2022

RESUMEN
Objetivo: El creciente número de investigaciones realizadas en el ámbito de la protección del medio ambiente ha dado lugar al establecimiento de un nuevo paradigma de investigación en el campo de la administración de recursos humanos (ARH) denominado "gestión ecológica de los recursos humanos" (GGRH). El presente estudio se ha llevado a cabo para poner de relieve el trabajo realizado en el campo de la GHRM y proporcionar una visión pictórica a los lectores para que comprendan la eficacia de la GHRM en diversas organizaciones.
Marco teórico: Este trabajo proporciona una explicación del desarrollo de la literatura y permite comprender los temas que han sido investigados en trabajos anteriores de la literatura en relación con la GHRM.
Diseño/metodología/enfoque: Para la redacción de este artículo se utilizó la recopilación central de Scopus y VOS-viewer. A efectos del estudio, se analizarán todos y cada uno de los documentos relacionados con la GHRM existentes en la base de datos entre 2008 y 2022. La presentación de los datos mediante visualización gráfica incorpora tanto el acoplamiento bibliográfico como las características de co-citación en la presentación.

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Resultados: Se descubrió que 418 documentos sobre la beca GHRM fueron evaluados en esta investigación bibliométrica. El objetivo de este estudio era examinar el volumen, la tendencia al alza, la distribución mundial, las principales revistas, los autores pioneros, los países dominantes y las industrias dominantes en el campo de la gestión global de los recursos humanos. Con el uso de operadores lógicos, se combinaron seis combinaciones de palabras diferentes para crear el producto final, "TITLE-ABS-KEY ("green human resource management" OR "green hr" OR "green human resource" OR " green human resource practices" OR "GHRM" OR "GHRMP")", con lo que el abanico se amplía. En la revisión, se constató que la GHRM sigue siendo una idea nueva. Esta revisión pretende ayudar a los investigadores modernos ofreciéndoles una visión general del estado actual de las cosas.
Investigación, implicaciones prácticas y sociales: Esta investigación proporciona un marco de evolución de la estructura del conocimiento más completo y objetivo para el período 2008-2022, lo que resulta útil para la evolución del campo de la Gestión de Recursos Humanos.
Originalidad/valor: Hemos añadido una perspectiva global a nuestra comprensión de la evolución del concepto a lo largo del tiempo al entrelazar información bibliográfica y diagramas de red en este trabajo.

Palabras clave: Gestión Ecológica de los Recursos Humanos, GHRM, Análisis Bibliométrico, Scopus, Vosviewer, Wordsift, Harzing's Publish or Perish.

INTRODUCTION

Globally, Green human resource management strategies appear to be used by a substantial number of firms, which is a positive development(Amrutha & Geetha, 2020; Yusoff et al., 2020). Exploring and summarizing these Green Human Resource Management (GHRM) strategies that are already being applied and will be practiced by businesses and other organizations will make a substantial contribution to the Human Resource Management (HRM) profession, both academically and practically (Bombiak & Marciniuk-Kluska, 2018; Mousa & Othman, 2020). After the 1990s, a developing subject of research in the field of organizational studies was GHRM (Arulrajah et al., 2015; D. Renwick et al., 2008; Shen et al., 2019).

Countries all over the world, whether they are developing or developed, are now paying attention to the environment. This is because heavy industrial activities have taken a toll on the environment (Jehan et al., 2020). Because of this, people seem to care a lot about how the environment is safe, and managers in businesses are taking steps to fix the problem (Pham et al., 2019; Pillai & Sivathanu, 2014). More and more researchers are looking at how human resource management (HRM) and environmental management (EM) practices, policies and procedures work together (Jackson et al., 2011; Yong et al., 2019). This is called "green HRM." It's also called the "systematic and planned alignment of typical HR management practices with the organization's environmental goals." (Jabbour, 2011; Opatha, 2013; D. Renwick et al., 2008). The field of Greenhouse Gas Reduction and Recycling (GHRM) has been studied by only a few scholars in the past (Acuff & Kaffine, 2013; Chester et al., 2008; Dunn et al., 2012). The term triple bottom line has been increasingly common in the last several years since the concept of HRM has evolved from economic to ecological and social (Mohammad et al., 2020;

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Yong et al., 2020). This puts more focus and reasonability on organizations in potentiating the global and business environment and being competitive in the market (Scott & Eakins, 2009; Yusoff et al., 2020).

GHRM is a group of HRM strategies that help businesses use resources more sustainably and keep the environment safe from damage caused by their work (Abdullah et al., 2009; Ahmad, 2015; Jabbar & Abid, 2014; Mousa & Othman, 2020). So, the idea of GHRM is to make sure that the workforce is environmentally friendly and that they are committed to the environment (Jabbour, 2013; Saeed et al., 2019). In order for sustainability to become a reality, HR has the opportunity to take on a more prominent role (Bondarouk & Ruël, 2009; Para-González et al., 2021; Renwick et al., 2008; Renwick et al., 2013). It says that the department of HR can play a big role in making sure that green policies are put into place (Yusoff et al., 2020).

"GHRM as a scale for credibility and development that results in workers' green behavior and awareness through the adoption of a green perspective and usage of green communication channels," Tang et al. (2018) write. According to Latan et al. (2018), "the functions and measurements of GHRM are extremely concrete and cause green concerns to be thought for, in workers' daily duties, as well as having good impacts on employees' lives and performances." "GHRM increases the credibility of companies and leads the labor force to show greater willingness to stay in their organizations, as well as causes better labor forces to be willing to be recruited by green firms," according to (Renwick et al., 2013).

When it comes to the definition of GHRM, there are two schools of thought that rule the roost (Charbel José Chiappetta Jabbour & de Sousa Jabbour, 2016; Opatha, 2013; Renwick, Redman, & Maguire, 2013). According to the first school of thinking, GHRM is an amalgamation of HRM elements like recruiting (Yusoff, Nejati, Kee, & Amran, 2020), performance management, training, development, and incentives, as well as environmental management (Mousa & Othman, 2020; Wilson & Bryant, 2021; Yong, Yusliza, & Fawehinmi, 2019), which aims to improve environmental performance of the organization where it operates (Charbel José Chiappetta Jabbour & de Sousa Jabbour, 2016; Opatha, 2013; Renwick et al., 2013). According to the second school of thought, HRM not only does combining activities with environmental management enhance environmental performance but then it is also required to modify employee attitudes and behaviors toward the environment, resulting in improved environmental performance (Akhtar, Bakar, Muhammad, & Din, 2022; Charbel José Chiappetta Jabbour & de Sousa Jabbour, 2016; Opatha, 2013; Renwick et al., 2013; Wilson &

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Bryant, 2021). The increasing trends and a number of the fields within the same domain are increasing day by day, thus there is a need for such kind of paper that combines all of the work and research that has been published till now (Ahmi & Mohd Nasir, 2019; Aidi Ahmi, 2019; Akhtar, Akhtar, & Bakar, 2021; Davidson, McPhail, & Barry, 2011). Therefore, this paper will develop a comprehensive bibliometric analysis of green human resource management.

A brief scan of the titles or abstract reveals that the author's contribution has not been fully explored. As a result, we decided to use the Scopus database to examine this feature in further depth in order to contribute to the body of knowledge in bibliometric and GHRM literature (Zakaria et al., 2021). To the best of our knowledge, this study integrates bibliometric analysis on green human resources management.

With the growing trend of GHRM, the current bibliometric review sheds light on the evolution of the published literature in Scopus database specifically connected to GHRM by posing some of the following research questions (RQs):

RQ1: How does the green human resource management publishing landscape currently look?

RQ2: How are citation patterns of the green human resource management publications currently structured?

RQ3: What are the most popular authors, journals, and countries that are working on green human resource management?

DATA AND METHODOLOGY

There is a lot of emphasis in this study's methodology on how data is collected and filtered until it reaches the point where it can be analyzed. The scope and topic of this study must be defined in accordance with the purpose of the study, which is to focus on all relevant studies in the Scopus database. Because of its reputation as the "biggest single abstract and indexing database ever developed" (Burnham 2006). One of the largest searchable citation and abstract literature search list, Therefore, the Scopus database was chosen for the current research.

Based on the research method, the documents used in this study were selected, which is presented in Fig. 1. The information was taken from the Scopus database on April 14, 2022. Specifically, the combination of the following keywords was employed: "green human resource management" or "green human resource" or "green hr" or "green human resource practices" or "GHRM" or "GHRMP" to provide a comprehensive list of all relevant articles (Ansari et al.,

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2021; Haddock-Millar et al., 2016; Kodua et al., 2022; Saeed et al., 2019; Úbeda-García et al., 2021). We extend the papers linked to the same issue that was based on the title, abstract and keywords of the document due to the lack of work on bibliometric analysis of green human resource management. The following words were searched as "Article Title, Abstract, Keywords" There were a total of 418 documents returned from this query as shown in figure 1. A series of data cleaning operations revealed that there were no duplicate documents, resulting in a similar number of documents being preserved following the procedure. In the following step, all of the raw data obtained from searches in the Scopus database was exported in MS-Excel in the form of comma-separated values (.csv) and research information systems (.ris) formatted files. For the purposes of this study, the bibliometric technique was used to examine all of the current research trends in GHRM research.

In addition, the database provides publication details such as the type of publication and the year it was published as well as the language used and the subject area covered. The database also includes source title, keywords, and abstracts as well as country, affiliation, citations, and authorship of the each publish document in Scopus database. A variety of software packages, including Microsoft Excel, Harzing's Publish or Perish (Ertaş & Kozak, 2020; Haley, 2014; Harzing, 2010), WordSift (Dumchoo, 2018; Hakuta, 2011; Roman et al., 2016) and VOSviewer (Van Eck & Waltman, 2013; Yu et al., 2020), were utilized for data analysis and data visualization, respectively. The majority of the mapping studies in this study are carried out with the help of the VOSviewer program. VOSviewer graphically represents the nodal network, such as the number and overall strength of the connections, using two uniform weights. The relevance and power of the linkages are reflected in the network size and network-connecting interlinking lines.

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Figure 1 - Search strategy flow chart.

Topic, Scope & Eligability		
	Topic	Green Human Resource Management (GHRM)
	Scope & Coverage	**Database:** Scopus **Search Field:** Article Title, Abstract, Keywords **Time Frame:** All **Language:** All **Source Type:** Journal **Document Type:** Article
	Keywords & Search String	TITLE-ABS-KEY ("green human resource management" OR "green hr" OR "green human resource" OR " green human resource practices" OR "GHRM" OR "GHRMP")
Screening	*Date Extracted*	14 Apr
	Record Identified & Screened	n = 418
Included	*Record Removed*	n = 0
	Record Included for Bibliometric Analysis	n = 418

Source: (Houghton et al., 2007; Zakaria et al., 2021)

RESULTS AND DISCUSSION

Analysis of this paper looked at scholarly works in the following ways: publication by year, document types, source types, publication by country and institutions, languages of documents, subject area, and citation pattern over years. This helped the paper answer the research questions it came up with in the previous section. The findings were shown in the form of frequency and percentage. It has been added to some of the analyses. For example, the total number of citations (TC)(Hitchcock, 2004; Sylvia, 1998; Willighagen, 2019), the number of citations per publication (C/P)(Price, 1965; Sylvia, 1998), the number of citations per cited publication (C/CP)(Garfield, 1964; Vaughan & Shaw, 2003), and the number of h-index and g-index (Ali, 2021; Egghe, 2006; Poirrier et al., 2021). It's important to know who the publisher is for the most popular source title, as well as how many times it has been used. As citation metrics, we report on the results of citation analysis, and we reveal the top 10 most cited articles in fields of the GHRM. In addition, we do a statistical study of authorship productivity in

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accordance with Lotka's law. we use VOSviewer to map the co-occurrence of the author keywords, and we present citation analysis as citation metrics(Oladinrin et al., 2022; Sood et al., 2021; Yu et al., 2020).

Green Human Resource Management Publication Status

The publication trend in the field of GHRM was examined using the Scopus database. The publication trend in the GHRM using total publications by year, document type, publication by source title, type of source title, publication by country, publication by institution, language, and publication subject area to answer RQ1 (How does the green human resource management publishing landscape currently look?). In order to generate the data for that analysis, we used the bibliographic data gathered from the Scopus database.

An overview of publications by year

The researcher can analyze the growing trend and popularity of the study subject through time by examining the documents depending on the year of publication in which they were published. As shown in (Table 1), a total of 418 publications on green human resource management from 20108 to 2022 in the Scopus database are being published. A total of (TP,128) papers were produced in 2021 with the best productivity recorded in that year computing around (30.62) percent of the total publication, out of the total publication only (NCP,87) papers are being cited. Whereas the highest citations were reported in 2020 (TC, 1813). The (C/P, 137) and (C/CP, 274) are reported high in 2011, whereas the (h, 23) and (g, 42) were high in 2019. The lowest productivity was recorded in 2010, with a (TP, 1). During the course of the research, there was a growth in the number of documents. The highest publication was reported in 2011 with 128 and the citations can be seen increasing from 2019 to 2022 (Figure 1).

Table 1 - Year of Publication

Year	TP	%	NCP	TC	C/P	C/CP	*h*	*g*
2008	2	0.48%	0	0	0.00	0.00	0	0
2010	1	0.24%	1	4	4.00	4.00	1	1
2011	2	0.48%	1	274	137.00	274.00	1	2
2012	2	0.48%	1	27	13.50	27.00	1	2
2013	8	1.91%	7	927	115.88	132.43	5	8
2014	6	1.44%	6	440	73.33	73.33	5	6
2015	7	1.67%	5	431	61.57	86.20	5	7
2016	17	4.07%	16	1359	79.94	84.94	14	17
2017	13	3.11%	12	828	63.69	69.00	9	13
2018	36	8.61%	32	1220	33.89	38.13	14	34
2019	48	11.48%	40	1812	37.75	45.30	23	42

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2020	94	22.49%	79	1813	19.29	22.95	22	39
2021	128	30.62%	87	566	4.42	6.51	14	18
2022	54	12.92%	17	63	1.17	3.71	5	7
Total	**418**	**100%**						

Total Number of Publications (TP); Percentage of publication (%); Number of Cited Publications (NCP); Total Citations (TC); Average Citations per Publication (C/P); Average Citations Per Cited Publication (C/CP); h-index; and g-index.

Figure 2 -Total Publications and Citations by Year
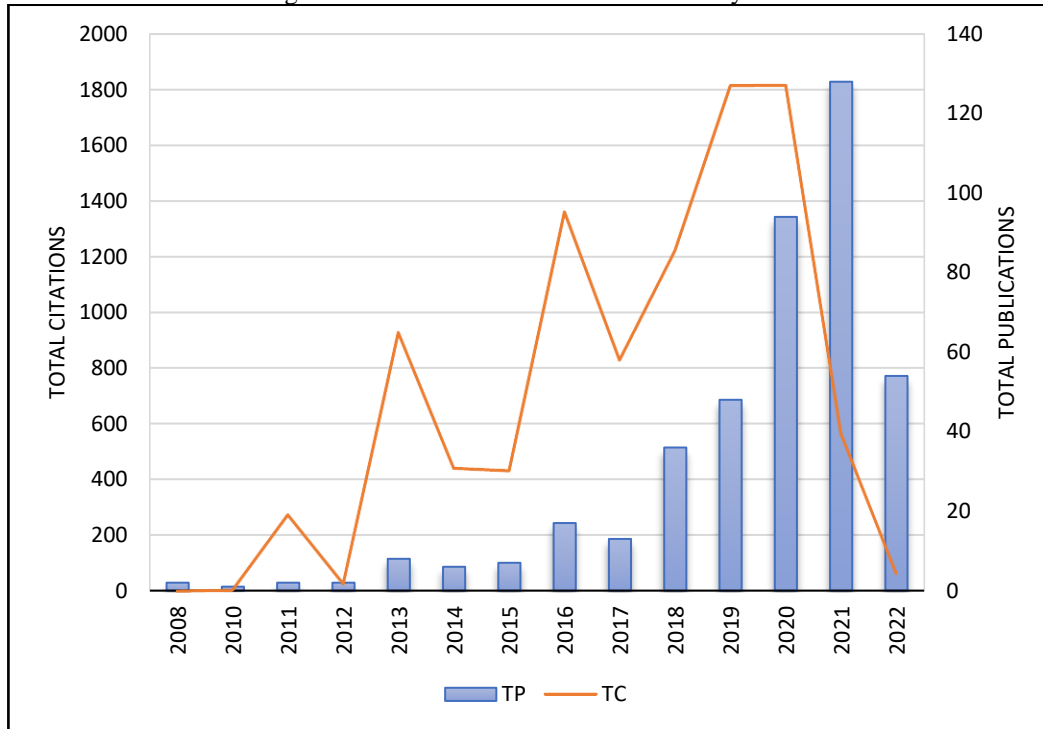
The Type of Document

When we talk about documents, we are referring to the type of document according to Scopus database, which may be classed into a few different categories, such as conference paper, article, book chapter, review, editorial, and note. To summarize the distribution of publications released on GHRM, which are divided into 9 document kinds with the total number of documents (418), which can be seen in (Table 2) below. The highest number of documents were articles (344), and the rest are being distributed as follows, Conference Paper (36), Review (19), Book Chapter (12), Conference Review and Erratum both have (2), and Book, Note and Retracted each have one documents.

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Table 2 - Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	344	82.25%
Conference Paper	36	8.63%
Review	19	4.56%
Book Chapter	12	2.88%
Conference Review	2	0.48%
Erratum	2	0.48%
Book	1	0.24%
Note	1	0.24%
Retracted	1	0.24%
Total	**418**	**100.00**

Specify the Source Type

The document obtained from the Scopus database is additionally subjected to further examination depending on the source type and title of the document. The classification of source title, which may be categorized into four groups, is illustrated in (Table 3). According to data obtained Journals are the most common form of source, account for 366 papers (87.53 percent), followed by conference proceedings, which account for 35 publications (8.39 percent). Book series also make up a considerable portion of the overall number of publications, accounting for 11 books (2.64 percent). Whereas the least work has been published as Book Series with a total of 6 nook series (1.44 percent).

Table 3 - Source Type

Source Type	Total Publications (TP)	Percentage (%)
Journal	366	87.53%
Conference Proceeding	35	8.39%
Book	11	2.64%
Book Series	6	1.44%
Total	**418**	**100.00**

Languages used in Documents

According to Table 4, English is used in the majority of publications in this field with 413 publications that account for (98.80 percent) of the total publications. Whereas, Arabic, Chinese, German, Portuguese, and Spanish are among the other languages with a single publication has been done in the current field.

Table 4 - Languages

Language	Total Publications (TP)*	Percentage (%)
English	413	98.80%
Arabic	1	0.24%
Chinese	1	0.24%
German	1	0.24%
Portuguese	1	0.24%
Spanish	1	0.24%
Total	**418**	**100.00**

Subject Area

The released documents are then classified according to their topic areas, as shown in Table 5. Business, management, and accounting 286, (68.42 percent), Environmental Science 135, (32.30 percent), Social Sciences 121, (28.95 percent), Energy 84, (20.10 percent), Engineering 82, (19.62 percent) make for the majority of GHRM. Other academic fields, such as Economics, Econometrics and Finance, Decision Sciences, Computer Science, and many other subject areas, have also written publications on Green Human Resource Management, as shown in Table 5.

Table 5 - Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Business, Management and Accounting	286	68.42%
Environmental Science	135	32.30%
Social Sciences	121	28.95%
Energy	84	20.10%
Engineering	82	19.62%
Economics, Econometrics and Finance	41	9.81%
Decision Sciences	40	9.57%
Computer Science	38	9.09%
Psychology	17	4.07%
Medicine	14	3.35%
Mathematics	10	2.39%
Arts and Humanities	9	2.15%
Agricultural and Biological Sciences	5	1.20%
Pharmacology, Toxicology and Pharmaceutics	5	1.20%
Biochemistry, Genetics and Molecular Biology	4	0.96%
Earth and Planetary Sciences	4	0.96%
Materials Science	4	0.96%
Physics and Astronomy	4	0.96%
Chemical Engineering	2	0.48%
Health Professions	1	0.24%
Multidisciplinary	1	0.24%

GHRM Citations Pattern

It is our goal to find the most important papers on the GHRM and to visualize the publication citation pattern using the Scopus database. In order to answer the second question

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(RQ2: How are citation patterns of the green human resource management publications currently structured?). We provided the citation metrics and examined the citation networks of 418 papers as shown in Table 6, which we found to be rather interesting. The quantity of citations from other works is used in citation analysis to determine the influence of the materials on the GHRM (Baker et al. 2020). To analyze the data, we used Harzing's Publish and Perish and VOSviewer software. Table 6 shows the citation metrics for papers (2008-2022) retrieved as of 14 April 2022. As shown, there are an average of 697.31 citations each year for the 418 articles retrieved, with a total of 9763 citations recorded.

Table 6 - Citations Metrics

Metrics	Data
Publication years	2008-2022
Citation years	14 (2008-2022)
Papers	418
Citations	9763
Citations/year	697.31
Citations/paper	23.41
Citations/author	3.23
h-index	54
g-index	90

Highly Cited Articles on GHRM

Table 7, lists the top twenty most referenced publications on the subject of melatonin. " Green Human Resource Management: A Review and Research Agenda," the paper with the most citations, was published in 2013. It garnered 572 citations, making it the most influential article in terms of citations per year (63.56 citations per year) (D. W. Renwick et al., 2013). Whereas, the second highly cited paper is "The Impact of Human Resource Management on Environmental Performance: An Employee-Level Study", published in 2014. The paper has 321 citations, and received (40.13 citations per year) (Paillé et al., 2014), is therefore placed in Table 7 in the second position. The rest of the highly cited papers on Green human resource management are shown in Table 7.

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Table 7 - TOP 20 Highly cited articles

No.	Authors	Title	Year	Cites	Cites per Year
1	D.W. Renwick, T. Redman, S. Maguire	"Green Human Resource Management: A Review and Research Agenda" (Renwick et al., 2013)	2013	572	63.56
2	P. Paillé, Y. Chen, O. Boiral, J. Jin	"The Impact of Human Resource Management on Environmental Performance: An Employee-Level Study" (Paillé, Chen, Boiral, & Jin, 2014)	2014	321	40.13
3	C.J.C. Jabbour, A.B.L. De Sousa Jabbour	"Green Human Resource Management and Green Supply Chain Management: Linking two emerging agendas" (Charbel José Chiappetta Jabbour & de Sousa Jabbour, 2016)	2016	280	46.67
4	S.E. Jackson, D.W.S. Renwick, C.J.C. Jabbour, M. Muller-Camen	"State-of-the-Art and Future Directions for Green Human Resource Management: Introduction to the special issue" (Jackson, Renwick, Jabbour, & Muller-Camen, 2011)	2011	274	24.91
5	J. Dumont, J. Shen, X. Deng	"Effects of Green HRM Practices on Employee Workplace Green Behavior: The Role of Psychological Green Climate and Employee Green Values" (Dumont, Shen, & Deng, 2017)	2017	264	52.8
6	S.K. Singh, M.D. Giudice, R. Chierici, D. Graziano	"Green innovation and environmental performance: The role of green transformational leadership and green human resource management" (Singh, Del Giudice, Chierici, & Graziano, 2020)	2020	256	128
7	Y.J. Kim, W.G. Kim, H.-M. Choi, K. Phetvaroon	"The effect of green human resource management on hotel employees' eco-friendly behavior and environmental performance" (Kim, Kim, Choi, & Phetvaroon, 2019)	2019	234	78
8	C.J.C. Jabbour	"Environmental training in organisations: From a literature review to a framework for future research" (Charbel José Chiappetta Jabbour, 2013)	2013	191	21.22
9	G. Tang, Y. Chen, Y. Jiang, P. Paillé, J. Jia	"Green human resource management practices: scale development and validity" (Tang, Chen, Jiang, Paille, & Jia, 2018)	2018	188	47
10	A.A. Zaid, A.A.M. Jaaron, A. Talib Bon	"The impact of green human resource management and green supply chain management practices on sustainable performance: An empirical study" (Zaid, Jaaron, & Bon, 2018)	2018	171	42.75
11	N.T. Pham, Z. Tučková, C.J. Chiappetta Jabbour	"Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behavior in hotels? A mixed-methods study" (Pham, Tučková, & Jabbour, 2019)	2019	161	53.67
12	H.A. Masri, A.A.M. Jaaron	"Assessing green human resources management practices in Palestinian manufacturing context: An empirical study" (Masri & Jaaron, 2017)	2017	156	31.2
13	C.J.C. Jabbour, D. Jugend, A.B.L. De	"Green product development and performance of Brazilian firms: Measuring the role of human and technical aspects"	2015	156	22.29

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	Sousa Jabbour, A. Gunasekaran, H. Latan	(Charbel Jose Chiappetta Jabbour, Jugend, de Sousa Jabbour, Gunasekaran, & Latan, 2015)			
14	A.A. Teixeira, C.J.C. Jabbour, A.B.L. De Sousa Jabbour, H. Latan, J.H.C. De Oliveira	"Green training and green supply chain management: Evidence from Brazilian firms" (Teixeira, Jabbour, de Sousa Jabbour, Latan, & De Oliveira, 2016)	2016	153	25.5
15	S. Ren, G. Tang, S. E. Jackson	"Green human resource management research in emergence: A review and future directions" (Ren, Tang, & E Jackson, 2018)	2018	148	37
16	S. Roscoe, N. Subramanian, C.J.C. Jabbour, T. Chong	"Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development" (Roscoe, Subramanian, Jabbour, & Chong, 2019)	2019	143	47.67
17	M. Guerci, A. Longoni, D. Luzzini	"Translating stakeholder pressures into environmental performance â€" the mediating role of green HRM practices" (Guerci, Longoni, & Luzzini, 2016)	2016	142	23.67
18	B.B. Saeed, B. Afsar, S. Hafeez, I. Khan, M. Tahir, M.A. Afridi	"Promoting employee's proenvironmental behavior through green human resource management practices" (Saeed et al., 2019)	2019	141	47
19	D.W.S. Renwick, C.J.C. Jabbour, M. Muller-Camen, T. Redman, A. Wilkinson	"Contemporary developments in Green (environmental) HRM scholarship" (Renwick, Jabbour, Muller-Camen, Redman, & Wilkinson, 2016)	2016	140	23.33
20	S. Ahmad	"Green Human Resource Management: Policies and practices" (Ahmad, 2015)	2015	138	19.71

Keywords

Without a doubt, author keywords are critical for academics looking for trends research fields. Aside from that, Wen and Huang (2012) argue that the growth of research topics author keyword analysis is critical. The study indicates that the most active author keywords in the second decade of the millennium after removing duplicates caused by spelling differences as illustrated in (Table 8).

VOSviewer, a software tool that is used for constructing and visualizing of the obtained data from Scopus database in to bibliometric networks, were used to map all keywords (which included both author keywords and index keywords) supplied for each document (Fig. 5). We look at the co-occurrence of each keyword that appears at least ten times in this section. A total of 92 keywords were found using this criterion. The color, circle size, font size, and thickness of the connecting lines in Fig. 5 reflect the strength of the link between keywords, whereas the color, circle size, font size, and thickness of the connecting lines indicate the strength of the relationship between keywords (Sweileh et al. 2017).

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In this diagram, each color indicates a cluster. In this visualizing map, there are three groupings. Cluster one (in red) has been grouped as Human Resource Management. Cluster two (in green) has been grouped as Environmental Performance. Cluster three (in blue) has been grouped as Green Human Resource Management. It is crucial to note that all of the terms created in Figure 4 are trending words that are being utilized in conjunction with Green Human Resource Management. So we may anticipate that future Green Human Resource Management will be focused on these terms in particular.

Table 8 - Top Keywords

Author Keywords	Total Publications (TP)	Percentage (%)
Green Human Resource Management	173	41.39%
Environmental Management	82	19.62%
Human Resource Management	81	19.38%
Sustainability	73	17.46%
Environmental Performance	64	15.31%
Human Resource	56	13.40%
Sustainable Development	52	12.44%
Resource Allocation	43	10.29%
Resource Management	43	10.29%
Green HRM	39	9.33%
Natural Resources Management	24	5.74%
Environmental Sustainability	23	5.50%
Corporate Social Responsibility	20	4.78%
Green Training	19	4.55%
Green Human Resource Management (GHRM)	18	4.31%
Green Supply Chain Management	18	4.31%
Human	18	4.31%
Human Resources Management	18	4.31%
GHRM	17	4.07%
Green Human Resources Management	16	3.83%

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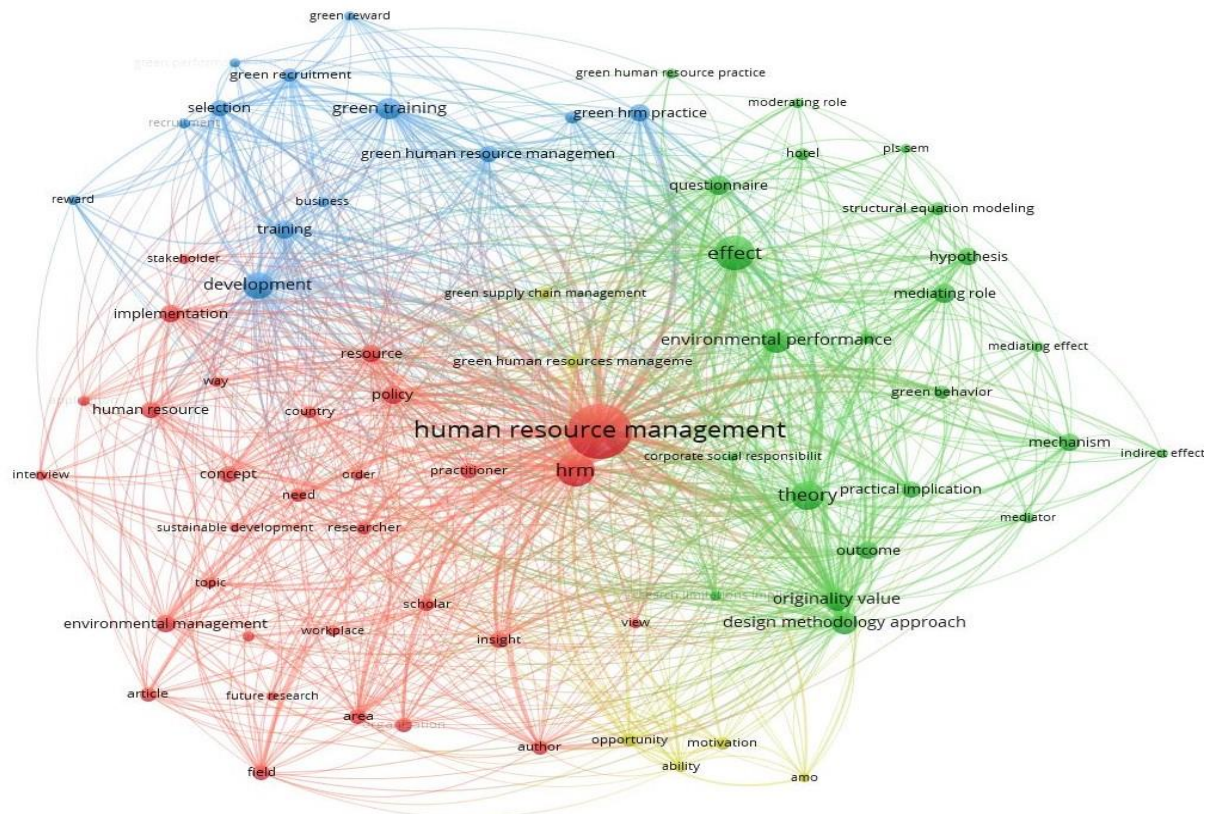Figure 3 - VOSviewer visualization of all keywords.

Figure 4 - WordSift visualization of all keywords.

Research Trends

The top country and institutions with the high number of publications, the number of authors per published document, the most active authors in the GHRM, and statistical analysis were used to answer RQ3: What are the most popular authors, journals, and countries that are

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working on green human resource management? The Harzing's Publish or Perish, VOSview and MS. Excel applicability was used in the GHRM data extracted from the Scopus database.

Top Productive Countries

According to data, the top three Asian nations are among the top 10 countries producing re-search papers in this field of study. Indonesia and India each produced five and seven publica-tions. The data shows which nations have published the most publications in the field of GHRM. As shown in Table 9, China, Malaysia, Pakistan, and India are revealed to be the three most ac-tive countries with more than publications. United Kingdom, Australia, France, Brazil, and Unit-ed States are among the countries with less than 20 publications. Whereas, Italy has the mini-mum number of publications with only 17 publications in the top countries list. If we look at the country with high TC and C/P, China is on the top with (TC: 59, C/P 2052) and the country with high C/CP. Brazil is the country with (C/CP: 70.88). The countries with high h and g indexed, Brazil publications have a high h index with (h: 83.77) and china with (g: 21). In addition to the above, map visualizations of the top countries contributing to the same field are shown in Figure 4. There are five groups of countries that collaborate. Clusters such as purple, blue, yellow, green, orange, and red as shown in Figure 4 are the collection of nations that generally collabo-rate among the writers associated with those countries. Furthermore, the size of the circle for any country in figure 5, indicates that it had published the greatest number of research papers in the field of GHRM, as well.

Table 9 - Top 10 Countries contributed to the publications

Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
China	82	19.62%	59	2052	25.02	34.78	21
Malaysia	70	16.75%	53	1139	16.27	21.49	17
Pakistan	53	12.68%	42	813	15.34	19.36	15
India	52	12.44%	34	819	15.75	24.09	17
United Kingdom	45	10.77%	41	2173	48.29	53.00	20
Australia	30	7.18%	27	1235	41.17	45.74	16
France	29	6.94%	28	1621	55.90	57.89	16
Brazil	26	6.22%	22	1843	70.88	83.77	16
United States	22	5.26%	20	1237	56.23	61.85	12
Italy	17	4.07%	14	902	53.06	64.43	11

Total Number of Publications (TP); *Number of Cited Publications* (NCP); *Total Citations* (TC); *Average Citations per Publication* (C/P); *Average Citations Per Cited Publication* (C/CP); *h-index*; and *g-index*.

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Figure 5 - VOSviewer visualization of the countries' contributions to the GHRM.
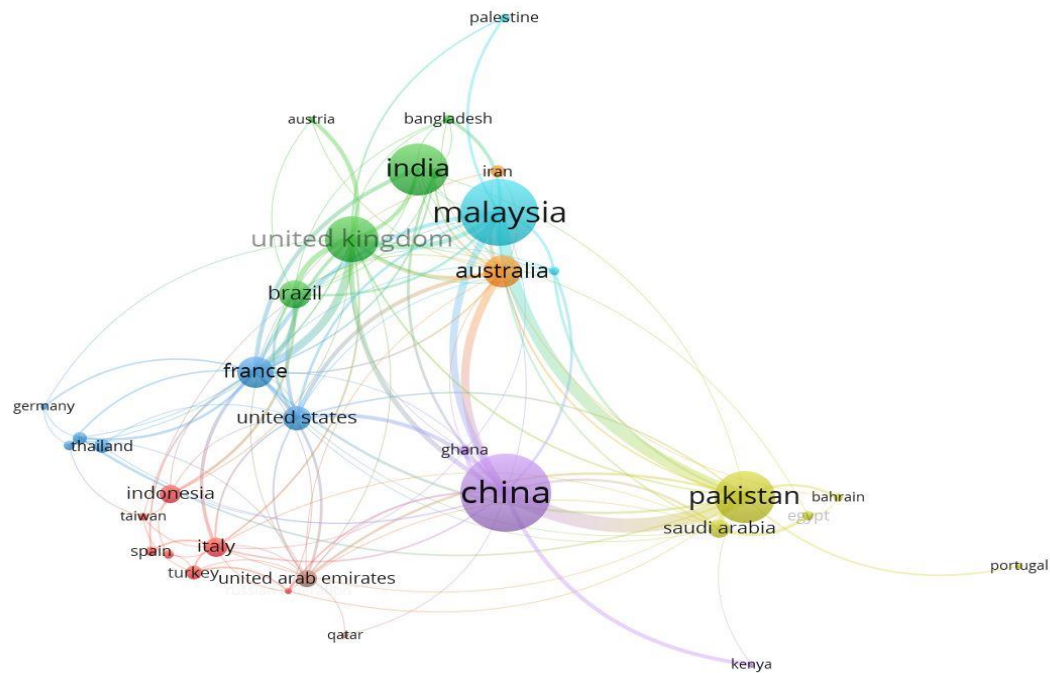
Most Productive Institutions

The number of publications by institutions is another way to assess the productivity of GHR Top 2 institutions with the high number of publications are the Universiti Sains Malaysia and Universiti Malaysia Terengganu with (TP: 16, NCP: 13, TC: 419) from Malaysia has produced the high number of papers on Green HumanResource Management, as seen in (Table 7). As shown in Table 10, the Universidade Estadual Paulista Júlio de Mesquita Filho, Montpellier Business School, Universidade de São Paulo are among the second-highest with more than 10 publications, followed by other institutions as shown in Table 7.

Table 10 - Top 10 Most influential institutions with a minimum of seven publications

Affiliation	TP	%	Country	NCP	TC	C/P	C/CP	h	g
Universiti Sains Malaysia	16	3.83%	Malaysia	13	419	26.19	32.23	8	16
Universiti Malaysia Terengganu	16	3.83%	Malaysia	11	509	31.81	46.27	9	16
Universidade Estadual Paulista Júlio de Mesquita Filho	15	3.59%	Brazil	15	1291	86.07	86.07	12	15
Montpellier Business School	15	3.59%	France	15	884	58.93	58.93	12	15
Universidade de São Paulo	12	2.87%	Brazil	10	652	54.33	65.20	8	12
Univerzita Tomáse Bati ve Zlině	9	2.15%	Czechia	9	316	35.11	35.11	6	9

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Xi'an Jiaotong University	9	2.15%	China	5	41	4.56	8.20	3	6
Shandong University	8	1.91%	China	7	452	56.50	64.57	6	8
Ministry of Education China	7	1.67%	China	3	13	1.86	4.33	2	3
Nottingham Trent University	7	1.67%	United Kingdom	6	75	10.71	12.50	5	7

Total Number of Publications (TP); *Percentage of publication* (%); *Number of Cited Publications* (NCP); *Total Citations* (TC); *Average Citations per Publication* (C/P); *Average Citations Per Cited Publication* (C/CP); *h-index*; and *g-index*.

Most Productive Authors

The number of authors who often publish on GHRM was is indicated by the retrieved data using Scopus database. As illustrated in Table 8, A minimum of five publications are noted for each author. As shown in Table 11, Jabbour, C.J.C. from the United Kingdom has the highest publication in the current field of GHRM with (TP: 17, NCP: 17, TC: 1698, C/P: 99.88, C/CP: 99.88, h: 14 and g: 17). Whereas, Yusliza, M.Y., and Renwick, D.W.S. is in the second position in table 8, with a high number of publications followed by Chiappetta Jabbour, C.J., Pham, N.T., Teixeira, A.A., Yong, J.Y., Guerci, M., and Ramayah, T.. the minimum of 5 publications are produced by Chaudhary, R. from India. In addition, the number of times an individual produced or co-authored a publication are summarized in (Table 12). There are 108 papers with three authors that count (25.8 percent), 88 papers with two authors that count (21.1 percent) and 51 single-authored papers that count (12.2 percent), and 171 multi-authored papers are being published that count (41 percent), ranging from zero to 8 authors per paper.

Table 11 - Top 10 Most Productive Authors

Author's Name	Affiliation	Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
Jabbour, C.J.C.	University of Lincoln	United Kingdom	17	17	1698	99.88	99.88	14	17
Yusliza, M.Y.	Universiti Malaysia Terengganu	Malaysia	15	10	468	31.20	46.80	8	15
Renwick, D.W.S.	Nottingham Trent University	United Kingdom	8	7	1015	126.88	145.00	5	8
Chiappetta Jabbour, C.J.	University of Lincoln	United Kingdom	7	7	356	50.86	50.86	5	9
Pham, N.T.	Viet Nam National University Ho Chi Minh City	Viet Nam	7	7	309	44.14	44.14	5	7
Teixeira, A.A.	Universidade Federal de Mato Grosso do Sul	Brazil	7	6	227	32.43	37.83	5	7
Yong, J.Y.	Taylor's University Malaysia	Malaysia	7	5	281	40.14	56.20	5	7
Guerci, M.	Università degli Studi di Milano	Italy	6	6	498	83.00	83.00	5	6

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Ramayah, T.	Universiti Sains Malaysia	Malaysia	6	4	284	47.33	71.00	4	6
Chaudhary, R.	Indian Institute of Technology Patna	India	5	5	144	28.80	28.80	5	5

Total Number of Publications (TP); *Number of Cited Publications* (NCP); *Total Citations* (TC); *Average Citations per Publicaon* (C/P); *Average Citations Per Cited Publication* (C/CP); *h-index*; and *g-index*.

Table 12 - Number of Author(s) per document

Author Count	Total Publications (TP)	Percentage (%)
1	51	12.2%
2	88	21.1%
3	108	25.8%
4	63	15.1%
5	64	15.3%
6	27	6.5%
7	7	1.7%
8	2	0.5%
0	8	1.9%
Total	**418**	**100.00**

*Conference review document. No author is listed.

Active Source

As shown in the below Table 13, a list of the top ten most active research journals in terms of TP, NCP, TC, C/P, C/CP, h, and g index. There were (TP: 36 papers) in the Journal of Cleaner Production, which came in a top position, followed by the Sustainability Switzerland, which came in second place (TP: 29 papers). For journals with at least 300 citations, a network visualization map for co-citation analysis is depicted in Figure 6. As indicated by a large number of connecting lines from other journals, the Journal of Cleaner Production was being co-cited with the majority of other publications in the study. Furthermore, the size of the circle for any journal in figure 6, indicates that it had received the greatest number of citations in the field of GHRM, as well.

Table 13 - Top 10 Most Active Source Title

Source Title	Publisher	TP	NCP	TC	C/P	C/CP	h	g
Journal Of Cleaner Production	Elsevier	36	34	2412	67.00	70.94	23	36
Sustainability Switzerland	Multidisciplinary Digital Publishing Institute (MDPI)	29	24	363	12.52	15.13	10	18
International Journal Of Manpower	Emerald	21	18	290	13.81	16.11	10	17
Corporate Social Responsibility And Environmental Management	Wiley-Blackwell	13	10	389	29.92	38.90	9	13
Benchmarking	Emerald	10	9	228	22.80	25.33	6	10
Business Strategy And The Environment	Wiley-Blackwell	10	10	370	37.00	37.00	6	10
International Journal Of Human Resource Management	Taylor & Francis	8	6	495	61.88	82.50	6	8
Contemporary Developments In Green Human Resource Management	Routledge	7	6	14	2.00	2.33	2	3

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Research Towards Sustainability In Action								
Journal Of Sustainable Tourism	Taylor & Francis	6	5	149	24.83	29.80	5	6
Proceedings Of The International Conference On Industrial Engineering And Operations Management	IEOM Society International	6	1	13	2.17	13.00	1	3

Total Number of Publications (TP); *Number of Cited Publications* (NCP); *Total Citations* (TC); *Average Citations per Publication* (C/P); *Average Citations Per Cited Publication* (C/CP); *h-index*; and *g-index*.

Figure 6 - VOSviewer visualization of the countries' contributions to the GHRM.
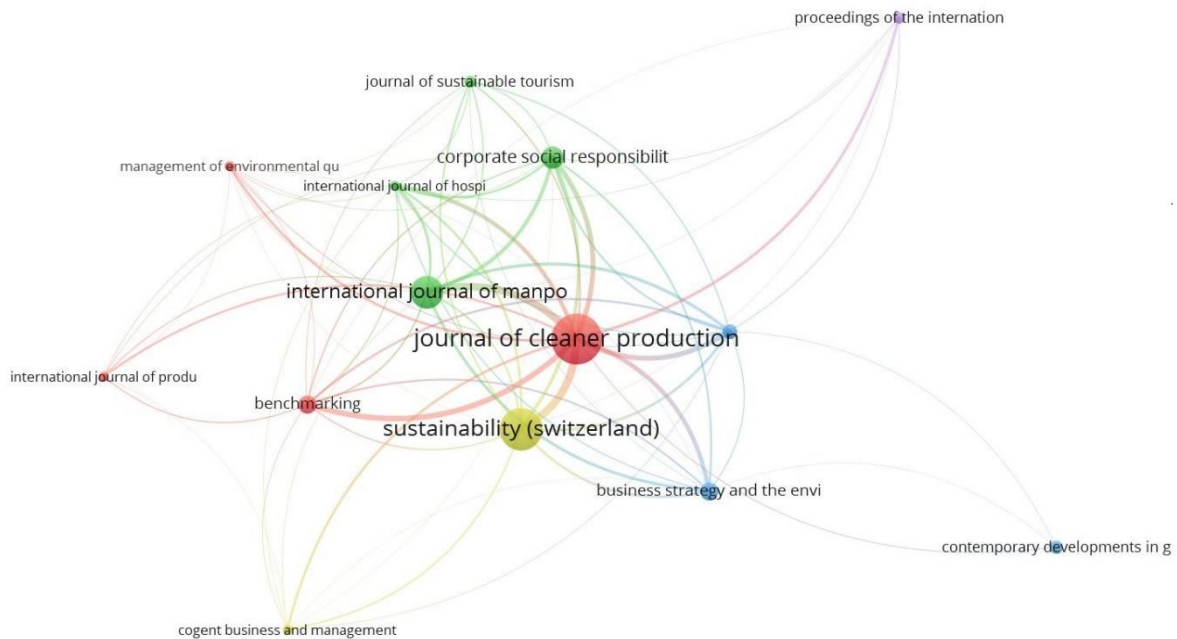
DISCUSSION

According to the information accessible in the Scopus database, from 2008 to 2022, the bibliometric analysis of the GHRM scholarship was uncovered by this study. Our article presents a detailed analysis of the studies on GHRM that have been undertaken in order to establish research trends and hot topics. As a result, this study gives guidance to academics interested in studying GHRM, as well as historical data, current trends, and future developments in the field of GHRM in order to construct a clear picture and guide for the GHRM. The statistical results reveal the highly cited paper in the field of GHRM is "Green Human Resource Management: A Review and Research Agenda" (Renwick et al., 2013), and the most productive author in the current field is "Jabbour, C.J.C.".

The majority of the research was undertaken in the developed countries in Asia, although emerging countries are also contributing to the knowledge base. Therefore, China is the country with a high number of Publications (TP: 82). The most productive institute with a high number of publications in the field of GHRM (TP: 16) and the most active source title in

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the current field is "Journal Of Cleaner Production" (TP: 36). The entire image of the GHRM will clearer if more nations work together in the same field. Because GHRM's fundamental focus is on environmental protection, environmental journals like "journal of cleaner production" have the highest number of citation effect despite their business and management roots in the field. Last but not least, the pattern shows a dearth of research in the service industry. Since manufacturing is far advanced in comparison to the service sector, the service sector must be addressed in order to further understand and evaluate the GHRM advancements.

CONCLUSION

Since 2008, there has been tremendous growth in the field of GHRM, particularly in the last few years, which had a significant impact on the current literature in the same field. GHRM is relatively new field, is of critical relevance to both business and academics. Cross-cultural and cross-sectoral research is needed because of the wide range of GHRM figures in the developing and developed worlds as well as the service and industrial sectors.

The data shows that GHRM has begun to emerge as a topic of interest. The number of publica-tions has increased considerably from 2017 to 2021. Even though progress has been made, there is a need for greater study in this area in the future. Journal articles make up more than half of all published publications, according to data generated 366 journal articles are being published in the same field. Nearly 413 publications were published in English, and at least 10 different nations contributed to the total. China has dominated cooperation with countries that have a common interest. According to the data generated the most active source title in the Journal of Cleaner Production and most productive author in the field of GHRM is "Jabbour, C.J.C." from United Kingdom.

However, the findings presented here have certain limitations. To begin, this study is based on articles that have been published in Scopus. In this strategy, the issue of researchers using the same name is also a concern. It's also important to remember that this research is focused on green human resource management. Since these findings are so unique, other researchers should be cautious about their applicability. Other databases, such as Google Scholar and Web of Science, can be used for bibliometric analyses to gather more data for future studies. The use of sociograms to discover the connections among various GHRM characteristics has to be investigated further. The GHRM is policy-driven, unlike traditional business subjects. Due to global economic and political changes, new difficulties in this subject

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area are expected to arise. To our knowledge, no latest comprehensive literature review of GHRM exists. Exploring and comparing to our bibliometric analysis is worthwhile.

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