

Review

Sustainable development goals and green human resource management: A comprehensive review of environmental performance

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ABSTRACT

Sustainable development goals and rising sustainability concerns push stakeholders and society to demand organizations adopt innovative practices that can contribute to business sustainability. This study aims to provide a systematic review through comprehensive bibliometric analysis of almost 1st quarter of the 21st century. The main focus is on how green human resource management practices promote and have a relationship with environmental performance, which is a significant part of sustainability. The authors systematically reviewed 242 top-tier articles from Scopus and Web of Science databases by following the "preferred reporting items for systematic reviews and meta-analyses" methodology. A significant relationship began in 2015 and gained popularity after COVID-19. The studies suggest that management should embrace the most demanding green human resource management practices, such as green competence building, motivation enhancement, and employee involvement, for better environmental performance. So, organizations can help acquire and retain committed and eco-friendly employees whose ecological values and objectives are compatible with the organization. The study also provides insight into the role of green human resource management practices in fostering eco-friendly behaviour of employees that, in turn, influence environmental performance. Most authors used the theory of ability-motivation-opportunity, a supporting mechanism for how organizations protect the environment through adopting green human resource management practices. In the future, corporate environmental responsibility, environmental regulations intensity, pro-environmental behaviour, and green work-life balance are suggested mechanisms to enhance environmental performance through green human resource management practices.

1. Introduction

The Sustainable Development (SD) attention journey began with the Brundtland Report in 1987, which introduced the concept of SD (Phillips, 2023). This report was discussed under the United Nations (UN) Conference on Environment and Development in 1989 and remained successful in spreading the idea of SD globally. Later, these efforts became part of the 2030 Agenda for Sustainable Development Goals (SDGs) in 2015, comprising 17 SDGs covering economic, social, and environmental aspects (Lyulyov et al., 2024). So, to attain the 2030 SDGs, countries integrate them into national policies, exerting pressure on organizations to embrace environmental, social, and ethical responsibilities. As a result, organizations have started to adopt innovative

practices, promoting the link between business operations and environmental sustainability.

However, climate change, economic fluctuations, conflicts, and events like COVID-19 have hindered progress toward achieving the SDGs (Nhamo and Chapungu, 2024). The world has spent half of its journey towards the SDGs 2030 deadline since its emergence; still, goals are not yet accomplished. Despite these obstacles, organizations can still work hard to achieve goals. Therefore, urgent actions are required to save the planet for us and future generations.

Society wants businesses to be ethically, socially, and environmentally responsible (Dong et al., 2024). Due to rising sustainability concerns, stakeholders demand organizations adopt innovative and sustainable practices that can contribute to business sustainability (Sun

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et al., 2024). As all activities are under and after human consent in any organization, the role of the human resources department is vital. Furthermore, green human resource management (GHRM) practices are essential for environmental performance (EP) because they serve as a key mechanism and provide a pathway through which organizations can align their operations with the principles of sustainability, which could lead toward the global sustainability agenda (Saeed et al., 2022; Shakil et al., 2024). It cultivates pro-environmental behaviour, environmental commitment, green innovation, green creativity, and environmental performance (Peng et al., 2024).

According to Raza and Khan (2022), different departments of businesses are progressively implementing the philosophy of “go green”. So, by integrating green human resource management practices (GHRMP), organizations can foster a culture of environmental responsibility among employees as, GHRMP affects employees’ attitudes, behaviour, commitment, and performance toward sustainability (Ansari et al., 2021). Kim (2022) also argued that proper green policies and implementing and promoting eco-friendly behaviour among employees may increase organizations’ commitment towards sustainability, eventually leading to less resource consumption, decreased carbon emissions, and an overall improvement in environmental performance and management.

To be green is a new shift for organizations, primarily due to national policies that require a commitment from both management and employees (Wu et al., 2022). It occurs through GHRM-influenced activities and promotes green behaviour among employees (DuBois and Dubois, 2012). It is argued that employees who appreciate green practices and care about the environment try to enhance environmental performance (Umrani et al., 2020). An ecological commitment stems from an intrinsic desire to protect or improve the environment (Kim, 2022). In the same perspective, Afsar et al. (2020) argued that higher emotional commitment is linked to better environmental performance at workplace, including recycling, energy efficiency, turning off extra lights, and general concern for the environment. In short, when workers are dedicated to the organization, they work hard to achieve their goals (Serenko, 2024).

Though all sectors pollute the environment, however, the manufacturing sector is the major contributor (Qian et al., 2022; Raza and Khan, 2022). Different toxic waste and hazardous chemicals, which are by-products of manufacturing operations as well as other industrial activities, have severely damaged ecosystems and human health (Pham et al., 2020; Wang, 2020). Many manufacturing industries rely on different natural resources, and their daily activities severely damage the environment’s fragile equilibrium (Chaudhary, 2020). So, industries are actively looking for alternate methods or such methods that can result in less damage to the ecosystem by incorporating environmental and social considerations into the fundamental fabric of their business models and operations (Cabral and Jabbour, 2020). GHRM emerges as a strategic solution that empowers industries to achieve their sustainability goals (Wang et al., 2023). In short, to build an ecologically conscious and engaged workforce, GHRM strategies can be implemented across the employee lifecycle, such as during hiring, training and development, performance appraisal, and incentive policies. Eventually, this promotes a responsibility culture regarding environmental concerns throughout the company, resulting in lower resource consumption, less waste generation, and increased ecological performance of workers and organizations.

This Biometric review comprehends Green HRM practices and their relationship to environmental performance which will provide detailed insights regarding publications, past/future trends, and prominent authors, that ultimately will help new prospective authors of those fields so that if anyone has intentions, then they can take benefit from the history and even can request to do a work through collaboration with senior authors of that fields. It also provide insights into the limitations of previous authors and future work recommendations by providing a more comprehensive, rigorous, and updated literature

synthesis on a particular relationship between GHRMP and EP, especially with a specific focus on relevant business, management, social science, and business psychology contexts. Keen scholars can gain dynamic perspectives on these popular themes and issues. These insights will allow forthcoming researchers to more appropriately update their current knowledge and methodology (Beloskar et al., 2024), which are the critical criteria for publishing the study in a reputable journal (Teixeira and Carvalho, 2024).

This study makes several significant contributions to the existing literature on Green Human Resource Management (GHRM) and Environmental Performance (EP). Firstly, conducting a comprehensive bibliometric analysis offers a thorough and up-to-date overview of the research landscape, highlighting the most influential studies, authors, and regions involved in this field. Secondly, the study uncovers intellectual structures and collaboration networks that have shaped the development of GHRM and EP research, providing valuable insights for future research directions. Thirdly, by synthesizing previous findings and identifying gaps in the literature, this study not only reinforces the importance of GHRM practices in driving environmental sustainability but also proposes areas where further exploration is needed. Finally, the findings serve as a guide for both scholars and practitioners, enabling them to build upon established knowledge while exploring new avenues for enhancing environmental performance through strategic human resource practices. This study’s contributions are crucial for advancing our understanding of how GHRM can be leveraged to meet global sustainability goals and for guiding future research efforts in this vital area.

2. Theoretical underpinning and literature review

The recent development has provided evidence and support to the idea that specific GHRM practices are significantly correlated with the environmental performance of organizations. Environmental performance is the commitment expected by organizations to guard the environment (Paillé et al., 2014). A lot of literature is present which shows the relationship of GHRMP with different fields such as green supply chain management (Maskuroh et al., 2023), finance (O'Donohue and Torugsa, 2016), Marketing (Aftab and Veneziani, 2024), innovation (Shah and Soomro, 2023), sustainability (Ziyadeh et al., 2024), environmental management (Rana and Arya, 2024), and environmental performance (Jnaneswar, 2024). Accordingly, GHRM has different dimensions for improving environmental performance (Aftab et al., 2023; Anwar et al., 2020). Based on the well-established Ability-Motivation-Opportunity (AMO) theory, which was proposed by Appelbaum (2000), it is argued that GHRM practices contribute to an organization’s environmental performance by increasing the extent to which employees can do according to their competencies, wants to do according to their motivation, and can do according to opportunities they got (Vázquez-Brust et al., 2023); details are shown in Fig. 1. According to Renwick et al. (2013) and Aftab et al. (2023), the first dimension of GHRMP is “green competence building practices” (GCBP), which fulfils the first criterion of AMO theory, called ability. Based on their abilities, employees get recruited and selected by the organization, and green training and green development programs help to raise employees’ ability regarding environmental knowledge and competencies (Teixeira et al., 2012). The second dimension is “green motivation enhancing practices” (GMEP), which fulfils the second criterion of AMO theory, called “Motivation”. GMEP includes performance evaluations and rewards that encourage workers to align their activities with the environmental objectives of the firm (Harvey et al., 2013). So, motivations from positive vibes like rewards and motivations from negative vibes like performance evaluations play vital roles in enhancing employee performance. The third dimension is “green employee involvement practices” (GEIP), which fulfils the third criterion of AMO theory: opportunity. GEIP includes empowering staff members to participate in environmental management decisions and offering solutions for environmental problems (DuBois and Dubois, 2012). Although

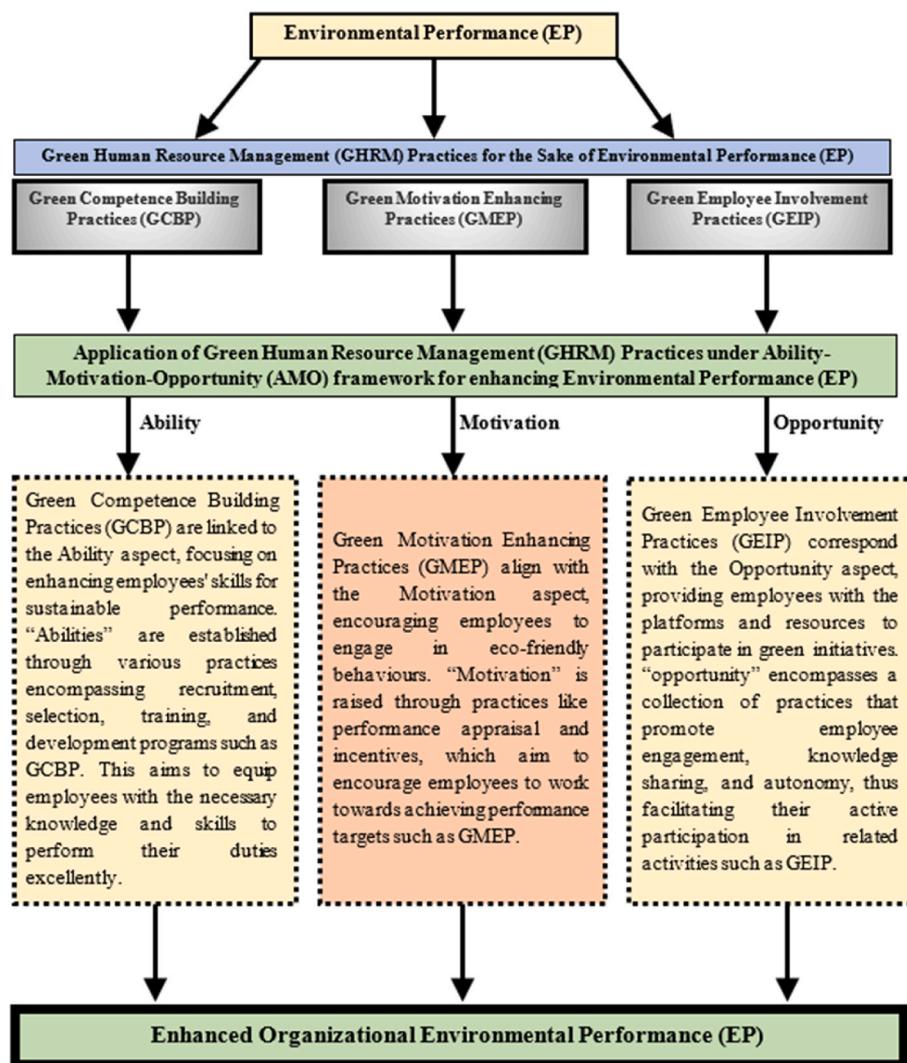


Fig. 1. Theoretical underpinnings for green HRM practices. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Source: Author's Constructed

AMO theory has been mainly adopted at the individual level, Jiang et al. (2013) have recently argued that it also holds both conceptually and empirically at the organizational level (Jiang et al., 2013; Pinzone et al., 2016).

GHRM practices, when well implemented, can improve environmental performance (Masud et al., 2023; Pham et al., 2019; Singh et al., 2020). Implementing GHRM practices is also essential because organizations face increased pressure from key stakeholders, such as customers and investors, to engage in eco-friendly management practices and produce environment-friendly products and services (Sun et al., 2024). The literature suggests that organizations should hire employees based on their environmental values, beliefs, and knowledge (Renwick et al., 2013). This way will enable the human resource management department to actively engage in green HR practices from the moment employees join the organization. Eventually, green practices will enhance efficiency, value creation, and cost control (Kim et al., 2019). Extensive academic research about the correlation between an organisation's green HRM strategies and overall success is evident. For example, Gilal et al. (2019) found that green HRM practices in higher education institutes help to improve environmental performance. Similarly, (Pham et al. (2019) proposed that GHRM practices such as green training, green performance management, and green employee participation increase employees' desire to participate in the organization's green initiatives.

According to previous research, organizational citizenship behavior also positively impacts environmental performance. Workers' pro-environmental behaviours, such as waste reduction, assist an organization in accomplishing its environmental goals and increasing ecological sustainability (Gilal et al., 2019). These studies underlined the need for future studies with a better research design (Khan and Muktar, 2024; Nisar et al., 2024).

The literature on GHRM practices and environmental performance has diverse dynamics and relationships with other essential elements and areas of business management and the industry. Extensive literature review with future research directions in a table format has been given in the appendix. However, it is worth noting that a considerable and growing body of scholarly work has focused on appreciating the characteristics of GHRM practices and their effects on environmental performance outcomes (Khan and Muktar, 2024; Pham et al., 2019; Singh et al., 2020). Therefore, it is worth investigating the evolution of HRM departments toward green HRM practices and their relationship with environmental performance, particularly in the literature from the twenty-first century to the present. This investigation will deepen our understanding of these pertinent emerging concepts in business, management, and accounting.

3. Methodology

3.1. Article selection process and PRISMA Flow Chart

For this bibliometric analysis, the authors conducted a comprehensive search using the Web of Science (WOS) and Scopus database, which involved different stages. The bibliometric analysis comprised 242 high-quality published articles in the WOS and Scopus databases between 2000 and Feb 2024. Authors use advanced search queries to find articles related to GHRM Practices and Environmental Performance (research queries are shown in the appendix). The search query utilized different keywords (such as “GHRM Practices”, “Green Human Resource Practices”, “Environmental Performance”, etc.). The initial search returned 1257 records from both databases, which were then filtered and narrowed down by following the methodology of “Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)” proposed by [Page et al. \(2021\)](#). So, put different substitute keywords regarding “green human resource management practices” and “environmental performance” in various combinations using different Boolean Operators (AND, OR, NOT). When searched the abstract, 105 and 1152 documents were retrieved from Scopus and WOS databases, respectively. These results were more general. To develop a specific solution, we narrowed it down by applying the time frame of 2000 to 24-Feb-2024, and then the results were *Scopus = 105/WOS = 903* articles. Early access articles are preferred for literature reviews because they offer original and authentic peer-reviewed results. So, after filtering it

according to document type, the authors found *Scopus = 94/WOS = 854* articles. As the authors’ primary concern was to target the Business, Management, Social Science, and Psychology fields due to topic need and selected keywords relationship as well as relevance, the authors applied the filter of the subject area and found *Scopus = 91/WOS = 232* articles.

Lastly, most research is published in English because English-speaking readers represent a larger population than others. As the authors have planned to write this manuscripts in English to reach a wider audience and enhance the visibility of their work, they applied English as a filter and found *Scopus = 91/WOS = 230* articles. In short, selecting the published peer-reviewed articles was carefully done by seeing the need and relevance to the research topic. Finally, 242 documents were selected for the bibliometric analysis. [Fig. 2](#) (PRISMA Flow Chart) provides the whole procedure step by step. A PRISMA chart was developed with the help of ShinyApp, an online utility provided by Haddaway et al. (2022), and then edited to give more details.

3.2. Bibliometric analysis

Bibliometric analysis is a well-established, developing, and successful approach for managing and interpreting massive quantities of data in business research ([Otitolaiye and Abd Aziz, 2024](#); [Saeed et al., 2023](#)). As targeted, both databases have different interfaces and properties, so we downloaded the two separate files with complete records and combined them using R Package’s command named “mergeDbSources” and

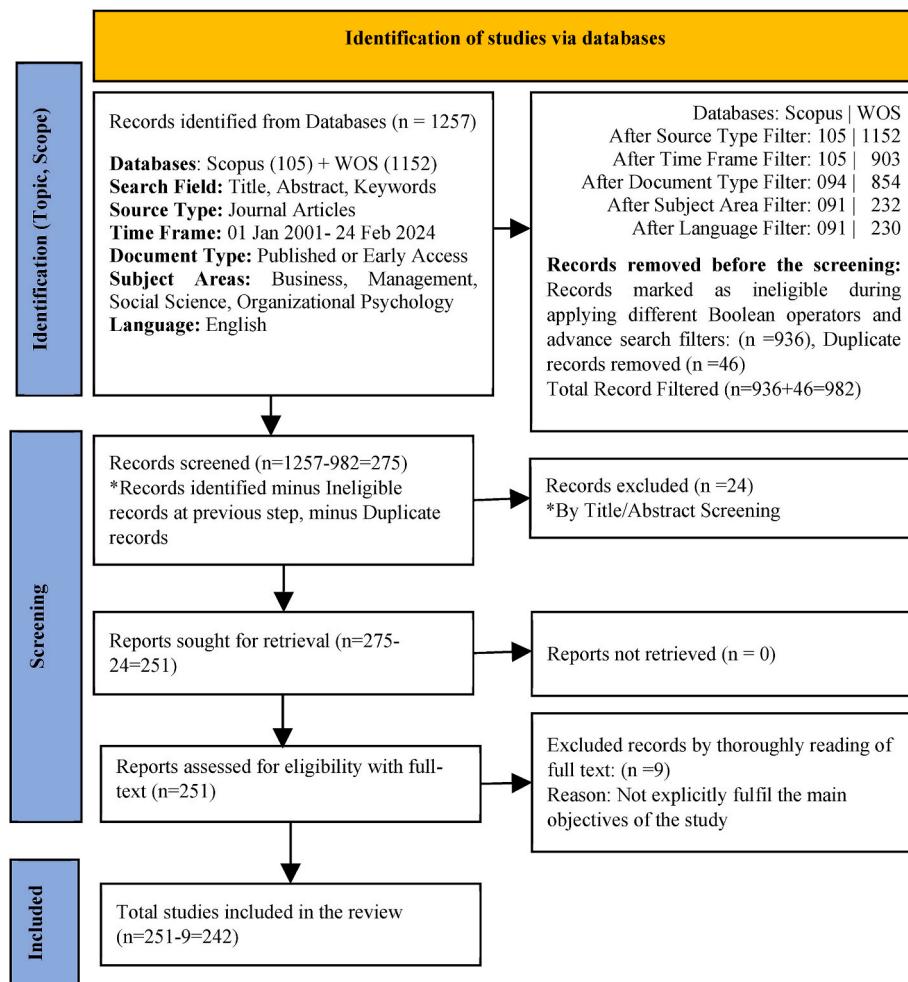


Fig. 2. Prisma Flow Chart.

Source: Author’s Constructed

analysed that data file through software named VOSviewer for bibliometric analysis according to the guidelines (Orduna-Malea and Costas, 2021). This bibliometric analysis included identifying top-cited articles, top authors, top countries producing the most documents and citations, and top journals to reveal the vital occurrence of keywords and collaboration among authors and countries through co-authorship and co-occurrence analysis. In the end, the authors use the method of "Rake" used for "keywords extraction" through Python by following the instructions of Rose et al. (2010) to get the most prominent and most recommended future directions so that this study not only provides bibliometric profile but provide directions for prospect researchers as well.

4. Results and discussion

4.1. GHRM practices and environmental performance bibliometric profile

4.1.1. Publication activity

Fig. 3 represents a bar chart for the number of published documents per year from 2000 to February 2024 concerning the GHRM practices and EP. According to our targeted filters from 2000 to 2015, different publications were retrieved, but after applying different filter criteria such as "document type, subject area, and language", the publications till 2015 were filtered out. Still, it does not mean that no publication was done on the studied relationship during this year. So, authors keep it the same as the truth and show the publication's actual record. It is evident that since 2016, scholars have given more attention, and the number of publications was enhanced, such as four publications in 2016, three in 2017, and so on during the following years. In 2023, a peak number of publications was recorded, with 81 published documents. The publication trend indicates a significant surge in published documents, with 241 publications. This rising trend proposes a growing interest in the field represented by GHRM practices and their relationship with EP-related publications.

4.1.2. Top articles

Table 1 illustrates the top 10 highly cited research articles about GHRM Practices and EP. According to the bibliometric analysis, the period from 2000 to Feb-2024 was the most prominent for GHRM practices and EP research, with a highly cited article titled " Green Innovation and Environmental Performance: The Role of Green Transformational Leadership and Green Human Resource Management" by Singh et al. (2020), with total 779 citations. This article was published in the journal "Technological Forecasting and Social Change" and continues to be widely popular among research scholars to get guidance—Table 1 also shares information for second, third, and so on in sequence by citations.

4.1.3. Top journals

Table 2 and Fig. 4a share the top 15 journals with the highest publications, discussing GHRM practices, their relationship with EP, and

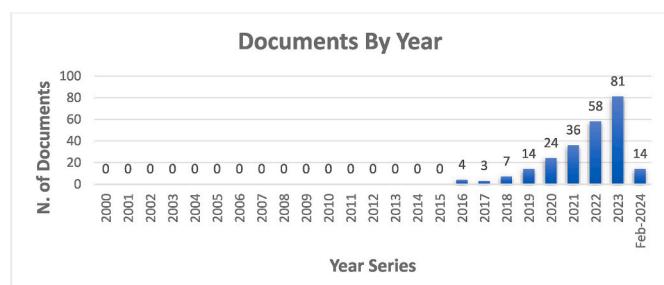


Fig. 3. Documents published between 2000 to Feb-2024.

Source: Author's Constructed

Table 1

Top 10 articles Ranked by total No. of citations.

Rank	Article Title	AY	JT	TNC
1	Green innovation and environmental performance: The role of green transformational leadership and green human resource management	Singh et al. (2020)	Technological Forecasting and Social Change	779
2	Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development	Roscoe et al. (2019)	Business Strategy and the Environment	364
3	The impact of green human resource management and green supply chain management practices on sustainable performance: An empirical study	Zaid et al. (2018)	Journal Of Cleaner Production	328
4	Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behaviour in hotels? A mixed-methods study	Pham et al. (2019)	Tourism Management	313
5	Assessing green human resources management practices in Palestinian manufacturing context: An empirical study	Masri and Jaaron (2017)	Journal of Cleaner Production	303
6	Translating stakeholder pressures into environmental performance – the mediating role of green HRM practices	Guerci et al. (2016)	International Journal of Human Resource Management	260
7	Pathways towards sustainability in manufacturing organizations: Empirical evidence on the role of green human resource management	Yong et al. (2020)	Business Strategy and The Environment	232
8	Role of big data analytics in developing sustainable capabilities	Singh and El-Kassar (2019)	Journal Of Cleaner Production	231
9	Green Human Resource Management for Organisational Citizenship behaviour towards the environment and environmental performance on a university campus	Anwar et al. (2020)	Journal of Cleaner Production	220
10	Green Human Resource Management and Employee Green Behavior: An Empirical Analysis	Chaudhary (2020)	Corporate Social Responsibility and Environmental Management	218

Note: AY=Author and Year of Publication; JT = Journal Title; TNC = Total No. of Citations.

their citations and publishers. According to the table, "Sustainability", "Journal of Cleaner Production", and "Environmental Science and Pollution Research" rank as the most productive journals in this domain, while the Journal of Cleaner Production" emerges as the most influential in terms of citations, as can be seen in Fig. 4b.

Table 2

Top 15 most productive journals Ranked by total No. of publications.

Rank	Journal Title	TNP	TNC	Publisher
1	Sustainability	27	342	MDPI
2	Journal of Cleaner Production	20	2283	Elsevier Sci Ltd
3	Environmental Science and Pollution Research	13	139	Springer Heidelberg
4	International Journal of Manpower	12	355	Emerald Group Publishing Ltd
5	Corporate Social Responsibility and Environmental Management	6	589	John Wiley And Sons Ltd
6	International Journal of Contemporary Hospitality Management	6	242	Emerald Group Publishing Ltd
7	International Journal of Productivity and Performance Management	5	117	Emerald Group Publishing Ltd
8	Business Strategy and Development	4	63	John Wiley And Sons Ltd
9	Business Strategy and The Environment	4	608	John Wiley And Sons Ltd
10	International Journal of Hospitality Management	4	244	Elsevier Sci Ltd
11	International Journal of Organizational Analysis	4	153	Emerald Group Publishing Ltd
12	Journal of Business Ethics	4	419	Springer
13	Journal of Sustainable Tourism	4	156	Routledge Journals, Taylor & Francis Ltd
14	Sustainability (Switzerland)	4	117	MDPI
15	Benchmarking-An International Journal	3	74	Emerald Group Publishing Ltd

Note: NP = Total No. of Publications; TNC = Total No. of Citation.

4.1.4. Top authors

Table 3 and Fig. 5 show the authors' article contributions to the GHRM Practices and EP relationship based on the number of published documents. Nisar, Qasim Ali has the highest number of publications on GHRM Practices and EP relationship ($n = 9$), affiliated with "The Superior College Lahore, Pakistan". Additionally, Chaudhary and Richa have ($n = 4$) documents and the remaining authors in Fig. 5 have fewer than four documents.

4.1.5. Top countries

Fig. 6 showcases the country's most prolific in researching GHRM Practices and EP. Some countries are deemed to be more "active" than others in this area, and as a result, they have contributed significantly to advancing research in the field. When it comes to producing research papers, China ($n = 59$) is the most prominent country, followed by Pakistan ($n = 56$), Malaysia ($n = 52$), and so on.

4.2. GHRM practices and EP's intellectual structure

4.2.1. Co-Authorships Authors' Map

According to Ponomariov and Boardman (2016), co-authorships reveal the collaborative relationships and social interactions that form the intellectual framework of a field. A co-authorship analysis was performed by examining the articles of authors who have written most of the documents on the relationship between GHRM practices and EP. To create a "Co-Authorships Authors' Map", we keep a minimum threshold level of one document in the scholar profile as eligibility, meaning the network of authors who have published a minimum of one co-author or have similar articles were selected in this map. A total of 738 scholars were eligible for this profile, but the most connectivity was found in 59 scholars, as shown in Fig. 7.

4.2.2. Co-occurrence of keywords

According to Yuan et al. (2022), the co-occurrence of words within a particular field indicates the interconnection of keywords and their role in shaping the intellectual framework of that field. In this study, 92 keywords with the most significant link strength met the minimum threshold of 5 occurrences from the 971 keywords for co-occurrence mapping in VOSviewer. Those 92 co-occurred keywords fell into seven clusters with 55 items, making a total of 783 links, and their overall strength was 3667. The finding of the analysis "co-occurrence of keywords" is presented in Table 4, which shows that "Green HRM Practices" was the most frequently occurring keyword with 217 occurrences and a total link strength of 1027 links. Meanwhile, HRM was second in the list of most occurring keywords, with 126 occurrences and a total link strength of 709 links. The third most occurring keyword was "Environmental Performance," with 113 occurrences and a total link strength

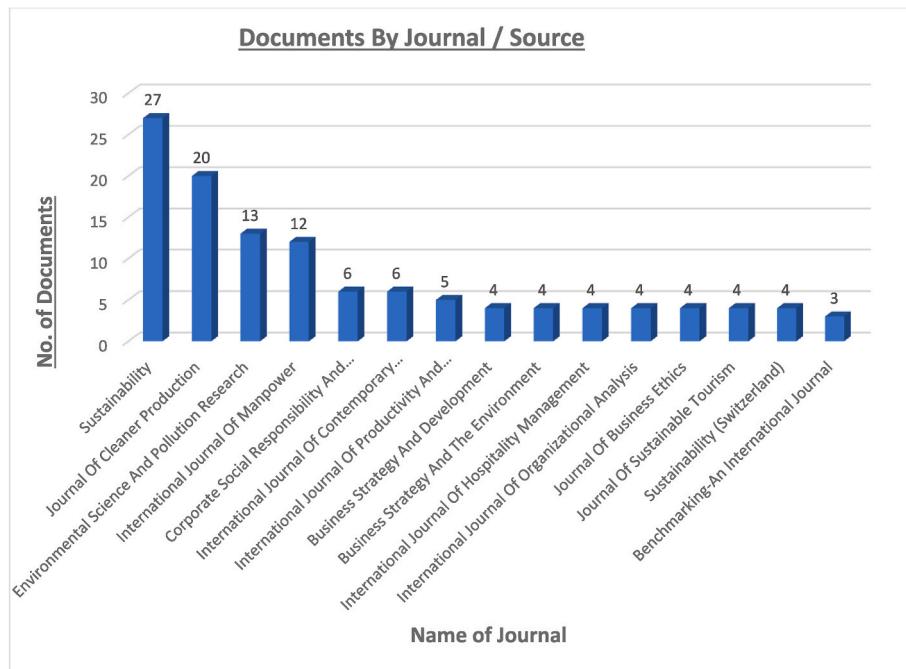
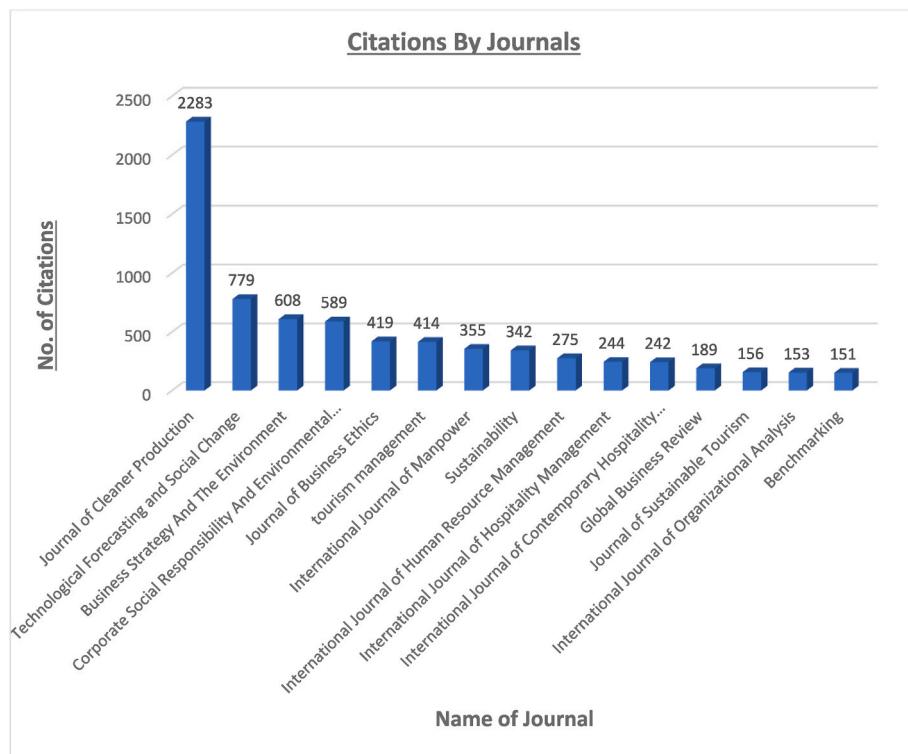


Fig. 4a. No. of published documents per year by source.

Source: Author's Constructed

**Fig. 4b.** Citations on documents per year by source.

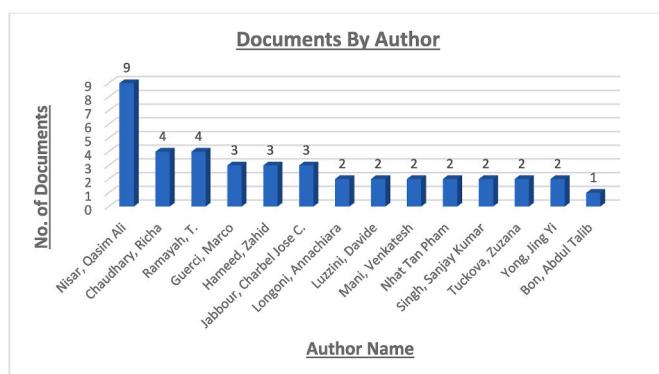
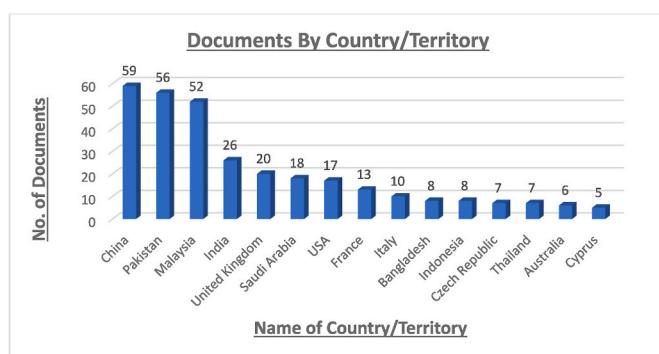
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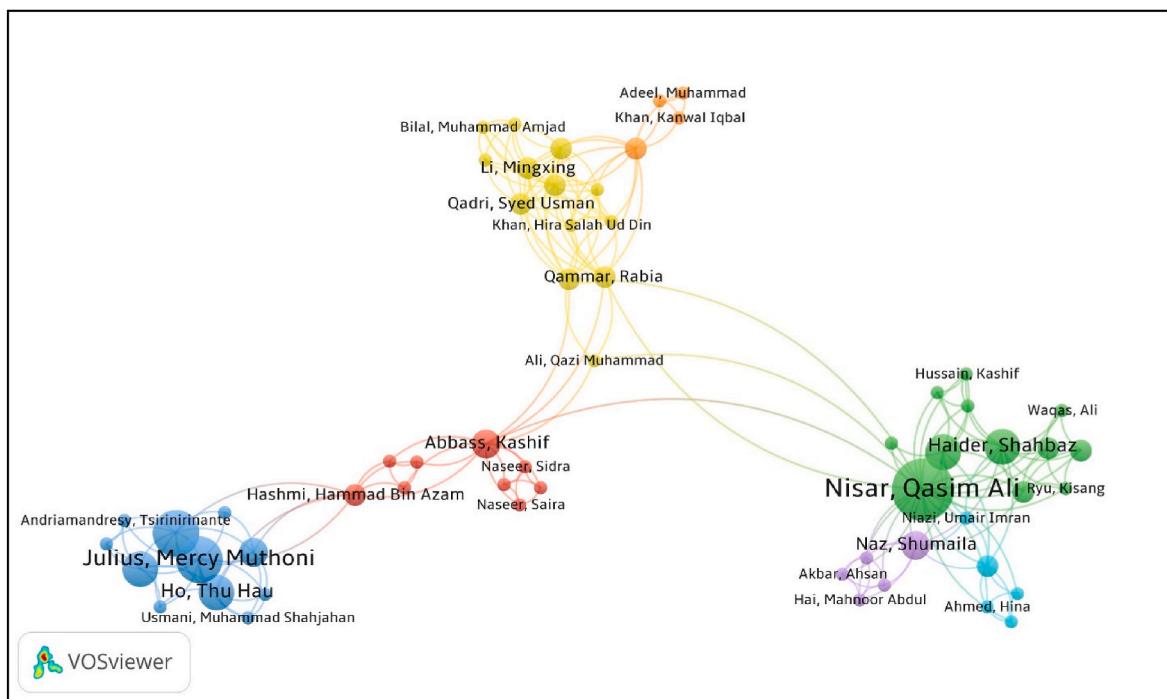
Table 3
Top 15 Author(s) Ranked by total No. of publications.

Rank	Author(s)	TNP	TNC	Current Affiliation
1	Nisar, Qasim Ali	9	256	The Superior College Lahore, Pakistan
2	Chaudhary, Richa	4	285	IIT Patna, Patna, India
3	Ramayah, T.	4	339	Universiti Sains Malaysia (USM), Malaysia
4	Guerci, Marco	3	679	Università Degli Studi di Milano, Milan, Italy
5	Hameed, Zahid	3	291	Prince Mohammad Bin Fahd University, Dammam, Saudi Arabia
6	Jabbour, Charbel Jose Chiappetta	3	557	Montpellier Research in Management, Montpellier, France
7	Longoni, Annachiara	2	476	ESADE Business School, Ramon Llull University, Barcelona, Spain
8	Luzzini, Davide	2	476	Audencia Nantes School of Management, Nantes, France
9	Mani, Venkatesh	2	271	Montpellier Business Sch, Montpellier, France
10	Nhat Tan Pham	2	357	Tomas Bata Univ Zlin, Zlin, Czech Republic
11	Singh, Sanjay Kumar	2	1010	Coll Business, Abu Dhabi, U Arab Emirates
12	Tuckova, Zuzana	2	357	Tomas Bata Univ Zlin, Zlin, Czech Republic
13	Yong, Jing Yi	2	292	Univ Sains Malaysia, Minden, Malaysia
14	Bon, Abdul Talib	1	328	Univ Tun Hussein Onn Malaysia
15	Chierici, Roberto	1	779	University of Milano, Bicocca, Milan, Italy

Note: TNP = Total No. of Publications; TC = Total No. of Citation.

of 561 links. Visual presentation can be seen in Fig. 8, where according to the occurrence of keywords with their link presented, the most occurring keywords have more visibility and links.

**Fig. 5.** Documents by author.
Source: Author's Constructed**Fig. 6.** Documents by country or territory.
Source: Author's Constructed

**Fig. 7.** Co-authorship authors map.

Source: Author's Constructed

Table 4
Rank of Co-occurrence of keywords.

Rank	Keyword	TNO	TLS
1	Green HRM Practices	217	1027
2	HRM	126	709
3	Environmental Performance	113	561
4	Sustainability	88	502
5	Performance	74	420
6	Green HRM	52	273
7	Corporate Social Responsibility	40	222
8	Environmental Management	38	246
9	Citizenship Behavior	35	209
10	Pro-Environmental Behavior	34	200
11	Supply Chain Management	29	180
12	Manufacturing Sector	25	146
13	Sustainable Development	22	130
14	Innovation	21	123
15	Hotel Industry	19	101

Note: TNO = Total No. of Occurrences TLS = Total Link Strength.

4.2.3. Leading countries and international collaboration

The co-authorship map of countries highlights the prominent contributors in a particular field on a global scale. In this study, 59 countries with the most significant link strength met the minimum threshold of one document published with co-authorship status, mapped in VOS-viewer, and presented in Fig. 9. Of those 59, only 48 were strongly connected, which falls in eleven clusters with 144 links, and their overall strength was 257. The finding analysis reveals that China stands out at the top significantly with 59 documents (with total link strength, $n = 186$), Pakistan at second number with 56 papers (having total link strength, $n = 166$), and Malaysia remains at the top third with 52 documents (having total link strength, $n = 178$). Other countries have also made significant contributions in producing papers, more citations, and greater link strength in the GHRM practices and EP research (see Fig. 9 and Table 5).

4.3. Analysis summary and research trends

The study strongly emphasizes Green HRM Practices, especially their relationship with Environmental Performance. Based on a thorough bibliometric examination, the authors noticed that GHRM practices are among the most significant sources of enhancing an organization's EP. Studies in different fields such as green supply chain management (Maskuroh et al., 2023), finance (O'Donohue and Torugsa, 2016), marketing (Aftab and Veneziani, 2024), innovation (Shah and Soomro, 2023), sustainability (Ziyadeh et al., 2024), environmental management (Rana and Arya, 2024), and environmental performance (Jnaneswar, 2024) are supporting the argument that GHRM practices have a strong influence on EP in different types of organizations. Organizations such as healthcare (Khan and Muktar, 2024), tourism (Rehan et al., 2024), education (Anwar et al., 2020), and manufacturing (Jnaneswar, 2024) are just some examples. Furthermore, multiple scholarly studies such as Khan and Muktar (2024), Aftab et al. (2023), and Farooq et al. (2022) have found a significant link between distinct types of GHRM practices and EP such as "Green Competence Building Practices(GCBP)", "Green Motivation Enhancing practices (GMEP)", and "Green Employee Involvement practices (GEIP)". Nisar, Qasim Ali is the most productive author (see Table 3) who published nine articles in high-quality journals. His research also concluded that GHRM practices are a significant factor in enhancing environmental performance in organizations. Singh et al. (2020) published an article that remains the most influential because it gained the highest citations ($n = 779$). It also concluded that employees who get support through green activities in the human resource department always have positive pro-environmental behavior, ultimately enhancing the organizational environmental performance. In terms of publications three most prominent journals were "Sustainability" ($n = 27$), "Journal of Cleaner Production" ($n = 20$), and "Environmental Science and Pollution Research" ($n = 13$) but in terms of total citations "Journal of Cleaner Production" ($n = 2283$), "Technological Forecasting and Social Change" ($n = 779$), and "Business Strategy and The Environment" ($n = 608$), were remain prominent which published articles on the relationship of GHRM Practices and EP.

According to Fig. 8, the results share that seven different clusters

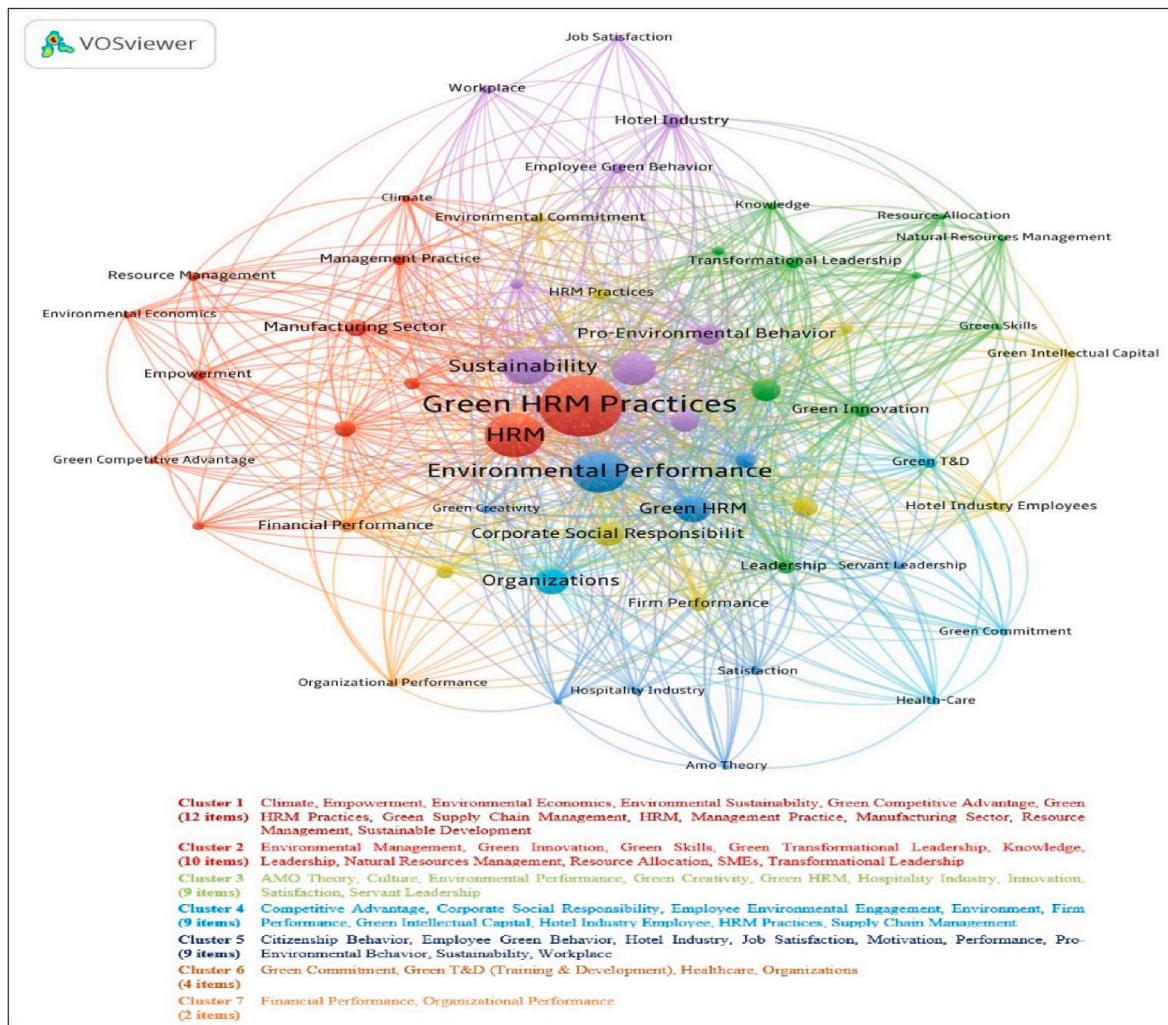


Fig. 8. Bibliometric map of Co-occurrence of keywords via network visualization.

Source: Author's Constructed

provide ongoing research trends. Cluster 1 is about “climate, GHRMP, and SD”. This cluster’s research themes are focused on how GHRMP helps to SD and green competitive advantage, notably in the manufacturing sector and green supply chain management. HRM practices are increasingly being aligned with climate-related goals and resource management in order to enhance environmental sustainability. Cluster 2 is about green innovation, leadership, and SMEs. This cluster highlights research trends regarding the role of leadership, particularly transformational and green leadership, in driving green innovation and environmental management within SMEs. The development of green skills that optimize resource allocation is gaining attention, particularly natural resource management being a particular focus. Cluster 3 is majorly focused on AMO theory, green creativity, and the hospitality industry. This cluster’s research is increasingly focused on the application of the AMO (ability-motivation-opportunity) paradigm to improve green innovation and EP, particularly in the hotel industry. There is also a rising interest in how culture and servant leadership may inspire happiness and creativity in environmentally conscious activities. Cluster 4 is all about corporate social responsibility, firm performance, and supply chain management. Research trends in this cluster involve the integration of corporate social responsibility (CSR) with green intellectual capital and HRM practices to improve firm performance, particularly in the hotel industry. The interplay between competitive advantage, employee environmental engagement, and supply chain management is also a key focus. Cluster 5 trends are pro-environmental

behavior, motivation, and job satisfaction. Studies in this cluster recommended keeping the emphasis on motivation by examining the relationship of pro-environmental behavior with job satisfaction and their impact on sustainability in the workplace. Employee citizenship behavior is acknowledged as an important feature in enhancing environmental responsibility within organizations, especially in the hospitality sector. Cluster 6 highlights the importance of green commitment, training, and development, particularly in the healthcare industry, where these practices are leading sustainability efforts. To enhance environmental performance (EP) in healthcare, future research should focus on cultivating a committed workforce through effective training and development initiatives. Cluster 7 highlights the connection between green human resource management (HRM) practices and both financial and organizational success. Recent studies indicate that environmental initiatives can directly contribute to improved financial performance, organizational success and overall organizational sustainability.

5. Conclusion and implications

The current study provides a comprehensive overview of GHRM practices and EP from 2001 to Feb-2024. It highlights the significance of GHRM practices for enhancing environmental performance in business, management, social science, and organizational psychology. Researchers continue to explore the complex relationship between GHRM

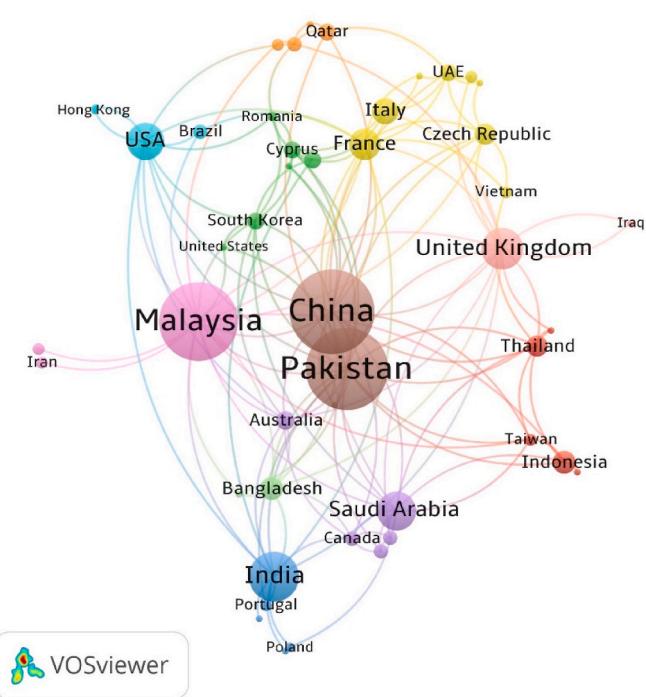


Fig. 9. Bibliometric map of Co-authorship via network visualization.

Source: Author's Constructed

Table 5
Countries rank with number of documents.

Rank	Country	TNP	TNC	TLS
1	China	59	45	186
2	Pakistan	56	10	166
3	Malaysia	52	91	178
4	India	26	8	99
5	United Kingdom	20	228	46
6	Saudi Arabia	18	16	54
7	USA	17	692	55
8	France	13	59	156
9	Italy	10	9	93
10	Bangladesh	8	81	26
11	Indonesia	8	101	21
12	Czech Republic	7	10	20
13	Thailand	7	186	26
14	Australia	6	208	20
15	Cyprus	5	1810	9

Note: TNP = Total No. of Publications; TNC = Total No. of Citations; TLS = Total Link Strength.

practices and EP. Recognizing and encouraging GHRM practices in organizations is increasing day by day. The findings of this bibliometric analysis relationship come up with two significant findings: one is about GHRM practices, and the second is about a prominent Ability-Motivation-Opportunity (AMO) framework on which basis this GHRM practices and EP model works. According to Khan and Muktar (2024) and Aftab et al. (2023), GHRM practices like "Green Competence Building Practices (GCBP)" provide employees with the necessary information and expertise to actively participate in environmental as well as sustainable activities, thereby minimizing resource usage & waste. Aftab et al. (2023) and Ansari et al. (2021) argued that "Green Motivation Enhancing Practices (GMEP)" encourage a sense of ecological accountability among staff, nurturing a culture of sustainability at the workplace.

Moreover, Farooq et al. (2022) and Jerónimo et al. (2020) also argued that "Green Employee Involvement Practices (GEIP)" guarantee that staff actively engage in environmentally friendly projects,

encouraging collaborative endeavours toward environmental objectives. The second significant finding during the analysis of GHRM practices and EP relationship is about the use of the Ability-Motivation-Opportunity (AMO) framework on which foundations this relationship works effectively and efficiently (Aftab et al., 2023; Gupta and Jangra, 2024; Iftikar et al., 2022). Integrating GHRM practices into different organizational activities enhances energy efficiency, minimizes waste, and encourages the implementation of environmentally friendly methodologies. When GHRM practices harmonise with environmental ideals, they establish a mutually beneficial connection that improves the total EP, guaranteeing long-term sustainability.

First and foremost, implementation is integration of GHRM Practices that organizations should incorporate GHRM practices, such as GCBP, GMEP, and GEIP, to significantly improve the EP. Then the adoption across different sectors is also among main implementations because various industries, including healthcare, tourism, education, and manufacturing, can benefit from implementing GHRM practices to align with sustainability goals and improve their impact on environment. Utilization of the AMO Framework is also a big point to effectively integrate GHRM practices, which helps in building employee competence, enhancing motivation, and providing opportunities for involvement in environmental initiatives. Focus on employee engagement through fostering a culture of sustainability through GHRM practices, organizations can encourage employees to adopt pro-environmental behaviors, leading to improved resource efficiency and reduced waste.

5.1. Limitations

While this paper provides a comprehensive and updated overview of the research on GHRM practices and EP, it is essential to acknowledge its limitations. First, in this study, we adopted a bibliometric and systematic approach, giving us comprehensive information but somehow limited to the objective overview. Second, this paper is limited to the data retrieved from Scopus and Web of Science databases, and only bibliometric analysis has been performed. However, more research is needed to generalize findings, especially when uncovering contextual elements that may explain potential variances.

Limitations always come up with suggestions, so this study provides future directions. In the future, researchers can perform bibliometric analysis by taking the keywords strategic HRM and pro-environmental behaviour of employees. The study context was not specific, so future research can be focused on different regions line, Gulf countries, "Belt and Road Initiative (BRI)" countries, countries that are part of the China-Pakistan-Economic Corridor (CPEC)" European countries, United States of America, War zone countries, and Next eleven (N11) countries. Multi-level and mixed studies can also be conducted by taking pre- and post-data related to COVID-19 and reflecting adverse effects on the relationship between GHRM practices and EP in case of any crisis. Region comparisons can also be conducted better to understand the insights of GHRM practices and EP..

5.2. Future research directions

Abo-Murad and Abdullah (2019) provide the future direction regarding exploring retention strategies such as rewards and appraisals concerning the relationship between GHRM practices and EP. Tulsi and Ji, 2020 proposed that corporate environmental responsibility (CER) is becoming more of a concern nowadays because GHRM practice can only be part of a department, and it will enhance EP if the whole organization adopts CER as a policy. Anwar et al. (2020) suggest some moderators, such as organizational citizenship behaviour towards the environment, to test the relationships between GHRM practices and EP. Amrutha and Geetha (2020) argue that employees are the main stakeholders of any organization, so within the relationship between GHRM practices and EP, the moderating effect of employee green behaviour should be

checked. Ruiz et al. (2024) proposed that cooperative and entrepreneurial archetypes necessitate the best and most well-defined GHRM practices oriented toward strategic environmental goals. Nisar et al. (2021) suggest to check the impact of green self-efficacy as a moderating variable. Bazrkar and Moshiripour (2021) suggested exploring green commitment and lifestyle as mediating variables in future studies. Shakil et al. (2024) suggested exploring some moderators like green performance evaluation or green recruiting and selection, green work-life balance, management support, and resource perspective. Raza and Khan (2022) did their study on the same discussed relationship in the hospitality industry. They provided many significant future directions, such as arguing that two other types of employee commitment force an employee to act like a green employee: normative and continuous commitment. They suggest checking both effects collectively and comparing them between GHRM and EP variables. They suggest influencing variables to check this relationship, such as religious values, employees' personality traits, and government support. They also provide valuable future recommendations about comparisons between two or more developed and developing countries. Liu et al. (2022) suggest exploring the individual GHRM practice's roles in developing greener employee attitudes to elevate sustainable consumption behaviour in regular and professional life. Aftab et al. (2023) and Deshpande and Srivastava (2023) provide future direction to check the intervening effect of green work-life balance, green training, and green emotional intelligence in the context of GHRM practices and EP. Aftab et al. (2023) suggest additional influencing elements, such as corporate culture, managerial support, and employee attitude, between the complex nexus of GHRM practices and EP. Shaukat et al. (2023) also provided their insights in favour of employees by arguing that green employee empowerment is an essential factor to know as an intervening variable between the relationship of GHRM practices and EP. Ogiemwonyi et al. (2023) suggest exploring the effect of intrinsic and extrinsic motivation with any leadership influence such as green transformational leadership. Rana and Arya (2024) also suggest that future research should explore task-related behavior, green commitment, and organizational identification as intervening variables. Moreover, the extensive literature review with future research directions in a table format has been given in the appendix.

Ethical approval

The authors mentioned in the manuscript have agreed to authorship,

Appendix

A-Table of most recent literature review

Authors & Year	Title	Main focus and future recommendation
Tamimi S.; Arshad R.; Haq S.U.; Chughtai M.A. (2024)	Application of green HRM and its impact on environmental performance: a case of construction projects	This study found that green HRM practices like recruitment, training, and compensation improve environmental performance in construction projects, with organizational culture moderating this relationship. Future research could explore the long-term impacts of GHRM on EP and investigate the role of national environmental regulations in shaping GHRM practices within the construction sector. The study shows that employees' green creative behavior is influenced by green HRM practices, particularly when combined with high environmental empowerment and altruism. Future research could explore the moderating effects of organizational culture and leadership on the GHRM-employee green creative behavior relationship, as well as investigate the long-term outcomes of such behaviors for organizational sustainability.
Farrukh, M; Rafiq, M; Raza, A; Iqbal, S (2024)	Beyond the surface: understanding the mechanism between green HR practices and employees' green creative behavior through mixed-methods exploration	Green HRM positively impacts organizational sustainability through corporate social responsibility and citizenship behavior in healthcare. Future research could explore the moderating effects of industry type
Ziyadeh et al. (2024)	Effects of green human resource management on organisational sustainability: the mediating role of corporate social responsibility and organisational citizenship behaviour	(continued on next page)

read and approved the manuscript and given consent for submission and subsequent publication of the manuscript.

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CRediT authorship contribution statement

Abdul Haseeb Tahir: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Muhammad Umer:** Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition. **Shazia Nauman:** Formal analysis, Investigation, Resources, Supervision, Writing – review & editing. **Kashif Abbass:** Writing – review & editing, Methodology, Investigation, Data curation, Conceptualization. **Huaming Song:** Writing – review & editing, Validation, Supervision, Software, Resources, Funding acquisition, Formal analysis, Data curation.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) leverage AI-assisted technologies to help generate the Python script to execute the various techniques employed in this study.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

(continued)

Authors & Year	Title	Main focus and future recommendation
Al-Swidi A.K.; Al-Hakimi M.A.; Al-Hattami H.M. (2024)	Fostering environmental preservation: exploring the synergy of green human resource management and corporate environmental ethics	and national culture on the proposed relationships, as well as examine the long-term consequences of GHRM on organizational performance. Green HRM and corporate environmental ethics jointly enhance environmental performance in Yemeni SMEs. Future research could examine the moderating effects of organizational culture and leadership on the GHRM-CEE relationship, as well as explore the long-term implications of these practices for organizational sustainability and societal impact.
Tanveer, MI; Yusliza, MY; Fawehinmi, O (2024)	Green HRM and hospitality industry: challenges and barriers in adopting environmentally friendly practices	The study identifies significant barriers to adopting green HRM in the hospitality industry and suggests a balanced approach between economic and environmental sustainability. Future research could focus on developing tailored GHRM interventions for the hospitality sector and exploring the role of government policies in facilitating the adoption of green practices.
Rana G and Arya, (2024)	Green human resource management and environmental performance: mediating role of green innovation – a study from an emerging country	Green HRM enhances environmental performance in Indian manufacturing through green innovation. Future studies should test this model in other contexts to broaden its applicability. Future research could explore the moderating effects of institutional factors and cultural dimensions on the proposed relationships, as well as examine the generalizability of the findings to other emerging economies.
Maheshwari, S; Kaur, A; Renwick, DWS (2024)	Green Human Resource Management and Green Culture: An Integrative Sustainable Competing Values Framework and Future Research Directions	The study presents a framework linking green HRM practices with organizational green culture, offering a diagnostic tool for sustainability. Future research should refine this model across diverse organizational settings. Future research could delve deeper into the specific mechanisms underlying the relationship between GHRM and Green Culture, as well as examine the moderating effects of contextual factors such as industry type, organizational size, and national culture. Additionally, longitudinal studies could explore the long-term consequences of implementing GHRM initiatives on organizational performance and societal impact.
Murillo-Ramos, L; Huertas-Valdivia, I; García-Muñoz, FE (2024)	Green human resource management in hospitality: nurturing green voice behaviors through passion and mindfulness	The study shows that green HRM fosters green voice behaviors in the hospitality sector through environmental passion and mindfulness. Future research could explore the moderating effects of organizational culture and leadership on the proposed relationships, as well as examine the long-term consequences of green voice behaviors on organizational sustainability.
Luu, TT (2024)	How and when to activate hospitality employees' organizational citizenship behavior for the environment in South Korea and Vietnam	The study identifies green authentic leadership and shared vision as key drivers of organizational citizenship behavior for the environment in hospitality. Future research could explore the long-term impacts of OCBE on organizational performance and environmental outcomes, as well as examine the generalizability of the findings to other cultural contexts.
m Alqudah M.K.; Yusof Y. (2024)	Improving Environmental Performance Through Innovative Academic Citizenship Behaviour	The study explores the impact of green HRM practices in Jordanian universities, finding positive effects on environmental performance mediated by academic citizenship behaviour. Recommendations include promoting green HRM practices to enhance organizational environmental performance.
Faheem, A; Nawaz, Z; Ahmed, M et al. (2024)	Past Trends and Future Directions in Green Human Resource Management and Green Innovation	A bibliometric analysis of GHRM and green innovation research trends highlights significant associations with environmental performance. Future studies should explore emerging gaps and directions to strengthen GHRM practices' impact on innovation and sustainability.
Niazi, A; Qureshi, MI; Iftikhar, M et al. (2024)	The Impact of GHRM Practices on Employee Workplace Outcomes and Organizational Pride	GHRM practices significantly influence employee commitment and thriving at work, mediated by organizational pride. Recommendations include fostering pride to enhance workplace outcomes and environmental commitment among employees.
Altassan M. (2024)	The Moderating Mediating Model of Green Climate and Green Innovation's Effect on Environmental Performance	The study examines green HRM and innovation in Saudi SMEs, highlighting the mediating role of eco-friendly behaviour in improving environmental performance. Future research should consider cultural and governmental factors influencing these practices.
Nisar et al. (2024)	The Role of Green HRM on Environmental Performance of Hotels	Green HRM practices in hotels improve environmental performance through employee green behaviour and self-efficacy. The study suggests focusing on HR practices that motivate green behaviours to enhance environmental performance in the hospitality sector.
Chakraborty, S; Bhattacharjee, J (2023)	A Green Workforce Understands & Practices Green Initiatives to Reduce Carbon Footprint	The study explores the awareness and implementation of Green HRM in Bangladesh, linking it to organizational environmental performance and job satisfaction. Future efforts should promote green HRM practices to achieve long-term organizational excellence.
Deshpande and Srivastava, AP (2023)	Linkage Between Green Training and Sustainable Organizational Performance	The study links green training and work-life balance with sustainable performance, moderated by emotional intelligence. Recommendations include further research on the role of green training in fostering a sustainable organizational culture.
Jiang et alYS; Zaman, SI; Jamil, S et al. (2023)	A Triple Theory Approach to Link Corporate Social Performance and Green Human Resource Management	The study develops a framework integrating GHRM with corporate social performance in Pakistan's banking sector. It suggests that

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Authors & Year	Title	Main focus and future recommendation
Nasir, M; Asad, N; Hashmi, HB et al. (2023)	Analyzing Pro-environmental Behavior of Pharmaceutical Employees Through Green HRM Practices	GHRM initiatives can enhance social reputation and sustainability, recommending further research on GHRM's role in organizational performance.
Yang, J; Malik, SY; Mughal, YH et al. (2023)	Assessing the Impact of Corporate Social Responsibility, Green Shared Vision on Voluntary Green Work Behavior	Green HRM practices positively impact employees' pro-environmental behaviour, mediated by green commitment in Pakistan's pharmaceutical sector. The study recommends implementing green HRM to foster environmental sustainability in organizations.
Ba Y.; Cao L. (2023)	Assessing the impact of green human resource management practices on environmental performance in China: role of higher education	The study highlights the mediating role of GHRM in enhancing voluntary green work behaviour through CSR and green shared vision in manufacturing companies. It suggests adopting green policies to motivate employees and achieve sustainability goals.
Ahmed, I.; Islam, T.; Umar, A. (2023)	Bridging organizational and individual green actions through green knowledge sharing & individual values	Green HRM practices significantly improve environmental performance in China's manufacturing sector, with higher education enhancing this effect. Recommendations include implementing policies that promote environmentally friendly activities and product development, which can increase customer loyalty.
Luu, T.T. (2023)	Can green creativity be fostered? Unfolding the roles of perceived green human resource management practices, dual mediation paths, and perceived environmentally-specific authentic leadership	GHRM practices influence employees' green organizational citizenship behavior through green knowledge sharing, moderated by individual green values. The study suggests focusing on under-explored mechanisms like green knowledge sharing and individual green values to strengthen GHRM's impact. Future research should further explore these relationships.
Farrukh, M.; Rafiq, M.; Raza, A.; Ansari, N.Y. (2023)	Climate change needs behavior change: a team mechanism of team green creative behavior	Perceived green HRM practices foster employee green creativity via green crafting and harmonious environmental passion, moderated by authentic leadership. Future research should explore additional mediators and moderators to better understand the HRM-creativity linkage in green management.
Ogiemwonyi et al. (2023)	Connecting green HRM practices to pro-environmental behavior through green human capital in the hospitality sector	Team-level GHRM practices positively impact team-level green creative behavior via a green psychological climate, with ethical leadership and green culture partially moderating this effect. Recommendations include fostering ethical leadership and green culture to enhance green creative behavior at the team level.
Ahmed, H.; Nisar, Q.A.; Khan, W.; Patwary, A.K.; Zaman, S. (2023)	Does green HRM really matter for sustainable performance? The role of environmental consciousness and green intellectual capital	Green HRM practices in the hospitality sector predict pro-environmental behavior via green human capital, except for green compensation. The study suggests further exploring the role of green human capital and developing strategies that focus on green hiring, training, and development to promote environmental sustainability.
Kim, T.T.; Kim, W.G.; Majeed, S.; Haldorai, K. (2023)	Does green human resource management lead to a green competitive advantage? A sequential mediation model with three mediators	Green HRM practices enhance sustainable performance in higher education institutions, mediated by environmental consciousness and green intellectual capital. Recommendations include emphasizing green intellectual capital development and further research into the interplay between environmental consciousness and sustainable outcomes.
Yue, G.; Wei, H.; Khan, N.U.; Saufi, R.A.; Yaziz, M.F.A.; Bazkiae, H. A. (2023)	Does the Environmental Management System Predict TBL Performance of Manufacturers? The Role of Green HRM Practices and OCBE as Serial Mediators	GHRM practices do not directly impact green competitive advantage in hotels, but do so through employee green work engagement, knowledge sharing, and creativity. Future studies should focus on refining the model and exploring additional mediators to better understand the sequential mechanism at play.
Uslu, F.; Keles, A.; Aytekin, A.; Yayla, O.; Keles, H.; Ergun, G.S.; Tarinc, A. (2023)	Effect of Green Human Resource Management on Green Psychological Climate and Environmental Green Behavior of Hotel Employees: The Moderator Roles of Environmental Sensitivity and Altruism	Environmental Management Systems positively influence triple bottom line performance through green HRM practices and organizational citizenship behavior for the environment. The study recommends further exploration of EMS's impact on TBL performance and suggests strategies for adopting green HRM practices to enhance sustainability.
Shah and Soomro (2023)	Effects of green human resource management practices on green innovation and behavior	Green HRM practices positively influence green psychological climate and environmentally responsible behavior in hotel employees, with environmental sensitivity and altruism as moderators.
Garavan, T et al., 2023	Employee perceptions of individual green HRM practices and voluntary green work behaviour	Recommendations include considering individual differences in environmental attitudes when implementing GHRM practices to maximize their effectiveness.
		Green HRM practices in Pakistan's automobile industry positively impact green innovation and behaviors like task-related and voluntary green behaviors. The study suggests that policymakers focus on these practices to encourage green innovation and behavior in developing countries. Further research should refine the proposed framework.
		This study reveals that individual Green HRM practices (recruitment, selection, performance management, compensation) positively impact voluntary green work behavior (VGWB) in Chinese manufacturing firms, with reflective moral attentiveness mediating most of these relationships. Future research could explore the moderating effects of individual differences, organizational culture, and external factors on the relationship between perceived GHRM practices and voluntary green work behavior.

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Authors & Year	Title	Main focus and future recommendation
He, R.; Wang, X., 2023	Enhancing industrial environmental performance: interplay among environmental sustainability, green HRM, and green competitive advantage	Green HRM practices are critical for achieving green competitive advantage and environmental sustainability in industries. Businesses using green HRM outperform competitors in environmental sustainability. Future studies could explore additional practices for greater competitive advantage and sustainability.
Sarmad, M et al., 2023	Fostering extra-role green behavior through green HRM practices: mediating role of green absorptive capacity	Green HRM practices significantly influence organizational citizenship behavior towards the environment (OCBE), with green absorptive capacity partially mediating this effect in the cement industry of Pakistan. Future research could explore the moderating effects of organizational culture, leadership, and external environmental pressures on the proposed relationships. Additionally, longitudinal studies could examine the long-term consequences of GHRM practices and green absorptive capacity on organizational sustainability.
ul Mateen, A et al., 2023	Fostering pro-environmental behaviors in the healthcare organizations	The study shows that green HRM practices in healthcare organizations enhance employees' pro-environmental behavior, mediated by corporate environmental strategy and green psychological climate. Focusing on significant GHRM practices can optimize resource use. Future research could delve deeper into the role of leadership, organizational culture, and patient engagement in promoting pro-environmental behaviors within healthcare settings. Additionally, longitudinal studies could examine the long-term effects of interventions on environmental performance and organizational outcomes.
Piwowar-Sulej, K et al., 2023	Fostering three types of green behavior through green HRM in the energy sector	Green HRM positively impacts in-role, innovative, and extra-role green behaviors, with environmental managerial support moderating these effects. Future research could examine this in different industries and consider additional moderating factors to better understand the green HRM-behavior relationship.
Xie, J et al., 2023	Green HRM practices for encouraging pro-environmental behavior among employees	This study explores the impact of Green HRM practices on pro-environmental behavior with job satisfaction as a mediator. Findings suggest that Green HRM enhances pro-environmental behavior, with job satisfaction partially mediating this relationship, except for green recruitment and selection. Future research could explore the moderating effects of organizational culture, leadership, and employee demographics on the relationship between GHRM and pro-environmental behavior, as well as examine the long-term consequences of these practices for organizational sustainability.
Gyensare, MA et al., 2023	Green HRM practices, employee well-being, and sustainable work behavior	The study examines how Green HRM practices affect employee well-being via green behavior, with resource commitment as a moderator. Findings highlight that Green HRM positively impacts well-being through green behavior, strengthened by resource commitment. Future research could explore the cross-cultural applicability of the findings, as well as the potential for developing a comprehensive framework for integrating GHRM, employee well-being, and sustainable work behavior within organizational strategies.
Niazi, UI et al., 2023	Green HRM, green innovation and environmental performance	The study investigates the roles of Green HRM, green innovation, and transformational leadership in environmental performance, mediated by green CSR. Results show a significant impact of green innovation on performance, with green CSR as a mediator. Future research could explore the long-term impacts of GHRM on organizational performance and employee well-being, as well as the potential for developing a comprehensive framework for integrating GHRM, green innovation, leadership styles, and environmental performance into organizational strategy.
Khan, RU et al., 2023	Green HRM, organizational identification and sustainable development	This study explores Green HRM's impact on sustainable performance via organizational identification, based on social identity theory. Findings indicate that organizational identification mediates the Green HRM-sustainable performance relationship. Future research could explore the cross-cultural applicability of the findings, as well as the potential for developing a comprehensive framework for integrating GHRM, organizational identification, and sustainable development into organizational strategy. Additionally, longitudinal studies could examine the long-term consequences of these practices for employee well-being and organizational performance.
Naz, S et al., 2023	Green HRM, psychological green climate, and pro-environmental behaviors	The study examines the impact of Green HRM and corporate environmental strategy on environmental performance through psychological green climate and pro-environmental behaviors, with environmental knowledge as a moderator. Findings highlight the need for integrating corporate strategy with Green HRM. Future studies could explore the moderating effects of organizational culture, leadership, and employee demographics on the relationship between GHRM, psychological green climate, and pro-environmental behaviors. Additionally, longitudinal studies could examine the long-term consequences of these practices for organizational performance and societal impact. Furthermore, research could delve deeper into

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Authors & Year	Title	Main focus and future recommendation
Hadi H.K. et al., 2023	Green HRM: The Link Between Environmental and Employee Performance	<p>the specific GHRM practices that most effectively contribute to a positive psychological green climate and the subsequent impact on different types of pro-environmental behaviors.</p> <p>This study explores the relationship between Green HRM practices and environmental performance, moderated by green work climate perceptions. Results show positive effects of Green HRM on both environmental and employee performance, with climate perceptions as a moderator. Future research might explore the long-term impacts of GHRM on organizational reputation and financial performance, as well as the potential for developing a comprehensive framework for integrating GHRM into overall business strategy. Additionally, cross-cultural studies could be conducted to examine the generalizability of the findings in different contexts.</p>
Islam, MA et al., 2023	Green HRM Practices and Millennial Employees' Turnover Intentions in Tourism Industry	<p>The study investigates Green HRM's influence on millennial turnover intentions in Malaysia's tourism sector, with work environment as a moderator. Only green involvement and rewards reduce turnover intentions, with no significant moderating effect of work environment. Future studies could explore the mediating roles of perceived organizational support, job satisfaction, and organizational commitment in the relationship between GHRM practices and millennial employees' turnover intentions. Additionally, cross-cultural comparisons could be conducted to examine the generalizability of the findings to different tourism contexts.</p>
Elshaer, IA et al., 2023	Green HRM and Brand Citizenship Behavior in the Hotel Industry	<p>The research explores how Green HRM practices influence brand citizenship behavior (BCB) through organizational pride and moderated by individual green values in the hotel industry. Results indicate positive effects of Green HRM on BCB, mediated by organizational pride. Future research could examine the potential for developing a comprehensive framework for integrating GHRM, brand citizenship, and customer satisfaction into hotel management strategies. Additionally, longitudinal studies could examine the long-term consequences of these practices for organizational reputation and financial performance.</p>
Lou X.; Zhang F., 2023	Green HRM and Corporate Environmental Performance: A Moderated Mediation Model	<p>The study investigates the impact of Green HRM on corporate environmental performance, mediated by environmental passion and responsibility, and moderated by supervisor support. Findings suggest significant positive impacts. Future research could extend this model by examining the dynamic interplay between GHRM, CEP, and other relevant variables over time. Additionally, cross-cultural studies could be conducted to assess the generalizability of the findings in different organizational contexts. Furthermore, exploring the long-term consequences of GHRM on organizational performance and societal impact would provide valuable insights for practitioners and policymakers.</p>
Veerasamy, U et al., 2023	Green HRM and Employee Green Behavior: Participation and Involvement, and Training and Development	<p>The study examines the effect of Green HRM on employee green behavior, moderated by green training and participation. Results show positive impacts of recruitment, institutional initiatives, and performance management on green behavior. Future research could explore the moderating effects of organizational culture, leadership, and job characteristics on the relationship between GHRM practices and employee green behavior. Additionally, longitudinal studies could examine the long-term consequences of these practices for organizational sustainability and employee well-being.</p>
Hameed, R.; Rehman, N.; Tufail, S.; Kiziloglu, M. (2023)	Green human resource management and environmental knowledge: A moderated mediation model to endorse green CSR	<p>This study finds that Green Human Resource Management (GHRM) positively impacts green Corporate Social Responsibility (CSR) through pro-environmental behavior and climate, although resistance to change can hinder these efforts. Future research should explore overcoming barriers to GHRM adoption and further examine the role of environmental knowledge.</p>
Wang et al. (2023)	Green human resource management and job pursuit intention: mediating role of corporate social responsibility and organizational reputation	<p>The research shows that GHRM practices increase job pursuit intentions through organizational reputation and CSR among students in Bangladesh. Future studies should investigate GHRM's role in attracting talent in other emerging economies and its long-term impact on organizational performance.</p>
Hadi, S.; Mutiani; Abbas, E.W.; Jumriani; Ilhami, M.R. (2023)	Green Human Resource Management for Tourism Sustainability	<p>This study emphasizes the importance of GHRM in Indonesia's tourism sector, particularly the need for tailored practices that prioritize opportunity over ability. Future research should focus on developing context-specific GHRM strategies for sustainable tourism in developing countries.</p>
Rehan, M.; Abbass, K.; Hussain, Y.; Usman, M.; Makhdum, MSA. (2023)	Green human resource management in Pakistan tourism industry: Moderating role of environmental knowledge and individual green values	<p>The study finds that GHRM significantly improves environmental performance through employee empowerment and green behavior, with environmental knowledge enhancing these effects. Future research should explore the long-term impacts of GHRM on organizational performance and tourist satisfaction, as well as the potential for developing tailored GHRM interventions for different segments of the Pakistani tourism industry. Additionally, comparative</p>

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Authors & Year	Title	Main focus and future recommendation
Iqbal, R.; Shahzad, K.; Chaudhary, R. (2023)	Green human resource management practices as a strategic choice for enhancing employees' environmental outcomes	studies with other developing countries could be conducted to identify best practices and challenges in implementing GHRM initiatives. GHRM practices enhance employees' environmental commitment and organizational citizenship behavior through harmonious environmental passion. Future studies should further investigate the affective mechanisms underlying GHRM's impact on green employee behaviors.
Ahmad, J.; Al Mamun, A.; Reza, M.N.H.; Makhbul, Z.K.M.; Ali, K.A.M. (2023)	Green human resource management, competitive advantages, and green ambidexterity	GHRM practices lead to green competitive advantage and ambidexterity, with firm size moderating these effects. Future research could explore the role of digital technologies and innovation in mediating the relationship between GHRM and green ambidexterity, as well as the impact of different national cultural contexts on these relationships. Additionally, longitudinal studies could examine the long-term consequences of these practices for organizational performance and societal impact.

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