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Article

A systematic literature review on green human resource management (GHRM): an organizational sustainability perspective

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A systematic literature review on green human resource management (GHRM): an organizational sustainability perspective

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ABSTRACT

The purpose of this systematic literature review is to identify trends in Green HRM research related to sustainability over the past decade and to determine how green human research management (GHRM) research is related to sustainability, its antecedents, and the level of implementation. After analyzing keywords through the VOSviewer application, the results showed that green human resource management is an umbrella keyword, allowing the identification of related research areas such as environmental management and environmental sustainability. The results also showed that most (63%) of the selected articles were published in the last three years and most of the articles were published in Q1 journals. Furthermore, most articles used quantitative methodologies and were conducted in developing countries. It has also gained the highest interest in employees' sustainable behavior and environmental sustainability, but there are few studies on social sustainability and economic performance. The study also found that the implementation level of GHRM in organizations is moderate, with very few studies in this aspect. The originality of this systematic review lies in examining the link between GHRM and corporate sustainability goals. This paper is limited to reviewing online sources using only academic articles from Scopus and Web of Science; other sources are ignored. It will help academics by providing future research directions for investigation. Top management can also better understand how GHRM helps organizations achieve sustainability goals.

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1. Introduction

Organizations in the twenty-first century face multiple challenges related to economic, social, and environmental issues (Alkhatib et al., 2023; Singh et al., 2019) and these challenges are forcing governments, corporations, customers, practitioners, and academia to pay attention to environmental sustainability (Usman & Balsalobre-Lorente, 2022; Vinkócz et al., 2023). Since the Brundtland (1987) Report was published, organizations have been responsible for balancing economic, environmental, and social sustainability. Since then, formulating strategies for balancing these sustainability issues for both private and public (Molina-Collado et al., 2022). Therefore, to ensure sustainable outcomes, organizations are more responsible in general and specifically for the environmental problems caused by their activities (Kézai & Kurucz, 2023; Koberg & Longoni, 2019; Mousa & Othman, 2020; Nemes & Konczos-Szombathelyi, 2023). On the other hand, climate change, extensive development, and industrial activities also produce a new set of challenges to the world and change competitive and regulatory patterns for the country and the organization. To mitigate the consequences of climate change, global authorities formulate policies, directly and indirectly, to

reduce greenhouse gas emissions (IPCC, 2018) to limit global warming to 1.5° Celsius. Therefore, businesses are more proactive in implementing policies and making strategic changes because of public pressure and regulatory frameworks. Therefore, companies are investing in low-carbon technologies and renewable energy to transition into an environmentally sustainable future (González-Benito & González-Benito, 2006). Therefore, significant efforts are required to mitigate environmental degradation and eliminate persistent inequalities in society (Gyurián Nagy & Gyurián, 2023). So, these challenges are pressuring corporations to embrace environmental policies at a faster speed, which can help companies become 'green and competitive' (El-Kassar & Singh, 2019).

Furthermore, in recent years, organizations have concentrated on a green workplace environment, which is a fundamental tool for gaining a competitive advantage (Gelencsér et al., 2024; Kiron et al., 2011). Organizations that implement green initiatives affect all organizational processes, including production and operation, supply chains, financial decisions, waste management (Pintér et al., 2021), human resource management, and strategic management (Benevenc & Buonomo, 2020). Thus, corporations are motivated to foster green workplaces and sustainable performance (Tóth et al., 2022), manufacture products, and provide services to balance the three criteria of sustainability. Thus, sustainability is a matter of conflict in organizations. Researchers and practitioners have suggested attaining sustainability through financial and nonfinancial practices to balance the equilibrium of the economic, environmental, and social dimensions of sustainability performance (Rebouças & Soares, 2021). Therefore, because there is no universal definition of sustainability, researchers often identify several measures to foster sustainability performance. Therefore, corporations have the triple bottom line of sustainability, also known as the Triple Bottom Line (TBL), to ensure successful business operations now and in the future: economic, environmental, and social performance (Hussain et al., 2018). Therefore, environmental sustainability performance is the ability of an organization to reduce air emissions and waste, decrease the consumption of hazardous materials, and reduce environmental accidents (Zhu et al., 2008). Similarly, Newman et al. (2016) defined social performance as the actual representation of green practices toward social aspects that lead to an increase in firm reputation among stakeholders (customers, suppliers, employees, and the public). Moreover, Khan and Muktar (2020) defined economic performance as the ability to minimize costs during material procurement, consumption of energy, waste treatment, and waste discharge, which are associated with business activities that are harmful to the environment (Elő & Paller &, 2023).

However, most current literature concentrates only on environmental sustainability performance. Thus, there is a literature gap that requires analysis and investigation of the social and economic dimensions of sustainability performance (Chiappetta Jabbour et al., 2020; Sarihasan et al., 2022; Tanveer et al., 2023). However, Pham et al. (2019) mentioned that research on this subject matter is still in its infancy, and further social and psychological mechanisms are required to explain the relationship between green human resource management (GHRM) practices and employee green behaviors (Gelencsér et al., 2023). According to Úbeda-García et al. (2022), sustainable environment management and green management are essential tools for organizations that demand multidisciplinary approaches to minimize their environmental footprint (Remsei et al., 2023). As such, it is a strategic issue with dominant cultural aspects relevant at the level of both management and employee groups (Kurucz & Potháczky-Rácz, 2018). In the past, environmental sciences were at the root of these issues (Khan & Muktar, 2020) and new fields of study have now emerged in the areas of social science and management research (Shrivastava & Berger, 2010).

One approach that has evolved in the organizational context to achieve sustainability and respond to environmental challenges is green human resource management (Aftab et al., 2023; Renwick et al., 2016) which refers to HRM activities aimed at enhancing positive environmental performance (e.g. minimizing paper usage, reducing waste, and promoting the recycling of water for sanitation purposes) (Csehné Papp et al., 2021; Kramar, 2014). Therefore, green HRM refers to 'the systematic, planned alignment of typical human resource management practices with the organization's environmental goals' (Jabbour, 2013, pp.147–148). Renwick et al. (2013) identify three components of GHRM: developing green ability, motivating green employees, and providing green opportunities. It plays a significant role in amplifying environmentally friendly practices by incorporating several HR practices such as green training, green performance appraisal, and green rewards (Dumont et al., 2017; Mousa & Othman, 2020). Jabbour and de Sousa Jabbour (2016) stated that GHRM has recently emerged as a new research agenda supported by Yong et al. (2020) that significant management tool for helping organizations to reduce their carbon

footprints and ensure sustainability. The first work connecting human resource management (HRM) and environmental management (EM) concerns was first published in 1996 and later published (Wehrmeyer, 2017), titled 'Greening People: Human Resources and Environmental Management.' The author first defines this type of HRM as 'green,' which was later established in research and literature as GHRM. Renwick et al. (2008) introduced and developed green HRM, which is a novel concept because it is linked to sustainability. Moreover, the main motive of GHRM practices is to develop and retain a competent green workforce that is environmentally conscious and works for the interests of the organization, its employees, and society at large.

Several studies have examined the links between GHRM practices and employee green behavior (Dumont et al., 2017; Mousa & Othman, 2020; Ye et al., 2022; Zhang et al., 2019), as well as environmental performance (Niazi et al., 2023; Nisar et al., 2021; Sathasivam et al., 2021a). In addition to quantitative studies, some of the previous well-known Systematic Literature Review (SLR) in the field of GHRM such as systematic review of GHRM: bibliometric analysis (Bahuguna et al., 2023), conceptualizing and theorizing GHRM: narrative review (Mukherji & Bhatnagar, 2022), sustainable HRM to corporate sustainability: Co-citation analysis based meta data (Kainzbauer et al., 2021), GHRM: a synthesis (Faisal, 2023), GHRM: a bibliometric analysis (Fachada et al., 2022), environmental management, HRM, GHRM: a narrative review (Molina-Azorin et al., 2021), GHRM: comprehensive review (Pham et al., 2020), GHRM: an evidence based review (Benevene & Buonomo, 2020), GHRM: A review based on hotel industry (Alreahi et al., 2022), GHRM: a Systematic review (Yong et al., 2019a), HRM for developing sustainability: contemporary challenges (Podgorodnichenko et al., 2020), GHRM: A review and research agenda (Renwick et al., 2013), GHRM: policies and practices (Ahmad, 2015), GHRM: A review by Ren et al. (2018) for need for measurement and conceptualization of GHRM as well as developing GHRM research framework, a bibliometric analysis of green HRM based on Scopus (Khan & Muktar, 2020). Therefore, the previous GHRM review was based on narrative review, conceptual papers, bibliometric analysis, and model development as a general outcome not specifically linked to sustainability. In addition, very few studies also combined synthesis and meta-analysis. So, currently lack of literature reviews about in-depth analysis of GHRM and its role in organizational sustainability. Therefore, there is a research gap in the comprehensive review of existing literature on how GHRM plays a role in improving organizational sustainability (economic, environmental, and social) performance. So, we performed a comprehensive review combining narrative reviews and meta-analyses to fill the gap in previous research.

Therefore, this study aims to analyze green HRM and organizational sustainability linked research published in different academic journals. The main purpose is to systematically review the existing literature focusing on Green HRM to identify current research trends and implementation levels for organizational sustainability and explore opportunities for future research.

The specific objectives of this study address the following research questions:

RQ 1: How has GHRM research been linked to sustainability developed in the recent past, specifically in the last 10 years?

RQ 2: What are the antecedents and determinants of Green Human Resource Management?

RQ 3: How does GHRM contribute to individual-level outcomes, especially sustainable employee behavior outcomes?

RQ 4: How has GHRM contributed to the organizational level, especially for the development of a sustainable organization in the context of the triple-bottom-line perspective?

RQ 5: What are the levels of implementation of GHRM practices in an organizational setting?

This paper contributes to the existing literature on GHRM in the following ways:

To our knowledge, this review is unique in the sense that it proposes future research directions to fill detailed research gaps and extend new knowledge on existing literature on how GHRM and sustainability performance are linked based on the triple bottom line (TBL). This is also a unique study that adds new knowledge about the antecedents of GHRM implementation, specifically how organizational culture and leadership behavior help to implement GHRM practices in the organization.

It is important to note that while most existing literature focuses on the internal perspectives of green human resource management (GHRM), such as green behavior and green performance; our paper also

has contributed to determining the implementation level of GHRM to promote sustainability in the organization. In brief, this review will guide researchers in investigating and exploring the emerging areas of study.

2. Materials and methods

This study uses a systematic literature review technique to examine, summarize, and draw conclusions from the current green HRM literature. This study aims to assess and categorize the available literature on Green HRM, with a focus on various objectives, as well as to identify future research areas. The review methods were adapted from (Danese et al., 2018) and subsequently adopted by Podgorodnichenko et al. (2020).

The objectives of the research are

1. To identify the trends in Green Human Resource Management (GHRM) research linked to sustainability over the last ten years.
2. To identify different antecedents of GHRM.
3. To determine the key role of GHRM in individual-level outcomes, specifically sustainable employee behavior outcomes in organizations in their previous literature.
4. To determine the role of GHRM in the development of sustainable organizations in the context of Triple Bottom Line (TBL) perspectives, considering the last ten years of research.
5. To identify the various antecedents of GHRM in organizational settings based on the previous decade of research in the field.

2.1. Conceptual boundaries

This review begins by identifying specific research questions and formulating objectives that are addressed by the systematic review process. The review then proceeds to formulate the conceptual boundaries (Danese et al., 2018; Podgorodnichenko et al., 2020). Thus, it is especially important to define the concept of GHRM and sustainability, which is the link between GHRM and sustainable employee behavior, as well as sustainability performance, in line with the triple-bottom line already defined. The basic keywords for the search were search string/keyword search: 'Green Human Resource Management' or 'Green HRM' or 'GHRM.' However, the authors rigorously studied the concept of individual-level GHRM outcomes and organizational-level GHRM outcomes related to sustainability performance. Organizational-level concepts are sustainability as a whole such as environmental performance, social sustainability performance, and economic sustainability performance also circular economy performance. Individual-level concepts are different employee behavioral outcomes such as green behavior, pro-environmental behavior, green value, green culture, and green self-efficacy. We chose to consider the concepts of GHRM and sustainability together to ensure the inclusion of relevant publications in our analysis, thus affording an extensive overview of the GHRM role and sustainability performance in an organizational setting. The country and cultural contexts are important for our study and analysis because studies carried out in different countries and industrial sectors yield different results, so these are important to validate the model. The review also identifies issues from a broad theoretical perspective: resource-based view, AMO theory, natural resource based theory, stakeholder theory, social cognitive theory, human capital theory, and social exchange theory.

2.2. Inclusion criteria

1. Search Boundaries: Online databases Scopus and Web of Science (WoS) with duplications removed by carefully deleting repeated titles using Excel.
2. To review GHRM research we select two databases because these two are the most trustworthy library and contain all details of records and an easy and distinct search interface. In addition, for

systematic review and meta-analysis, these two are the most targeted databases for most of the researchers in various fields (Alreahi et al., 2022; Szabó-Szentgróti et al., 2023). Finally, these two have algorithm-based search mechanisms for professional searching rather than Google Scholar (Sekhniashvili, 2021). Moreover, the selection of two databases produces a lot of similar data and duplication that needs time to remove it carefully.

3. Database search process: The generic combination of keyword search is applied in this study which is 'Green Human Resource Management' or 'Green HRM' or 'GHRM' in both Scopus and WoS. In Scopus, search queries are adopted to title, abstract and keywords and collected data are related to GHRM research. In Scopus particularly the advanced search TITLE-ABS-KEY ('Green Human Resource Management' OR 'Green HRM' OR 'GHRM') AND PUBYEAR >2011 AND PUBYEAR <2024 AND (LIMIT - TO (LANGUAGE 'English')). The only filtering, we have done here is the language section and period is from 2012- 2023. The terminal point of time of data collection from Scopus is 2023-03-31.

In the Web of Science (WoS), we apply search combination in advanced search applying topic Field (TS) and WoS states 'TS' as titles, abstracts, authors keywords, and keywords plus, so the search string in WoS database in this study is, TS = ('Green Human Resource Management*' or 'Green HRM*' or 'GHRM*'). The filtering, we have done in this advanced search in the language section which defined as Refined by: English and the time span: 2012-01-01 to 2023-03-31(publication date). We also filtered in document types sections as refined by not document types: retraction or letter or retracted publication or editorial materials.

So, we include publications and documents in English from both Scopus and WoS. The GHRM-linked sustainability data are collected by the authors and evaluate which papers are linked to TBL of sustainability (economic, environmental, and social) and carefully selected the papers for synthesis. Although searching for articles based on keywords does not produce comprehensive results, this approach is the best scientific practice for systematic review. The limitation is that authors select the final paper based on individual judgment, which may create potential biases. So, we checked repeatedly the final paper based on search criteria.

Covered period: The study is based on the last ten years (from 2012 to March 2023). The year 2012 was chosen as the starting point for collecting relevant data, as it is a benchmark year in which the importance of environmental training in implementing cleaner production and sustainability issues has increased, especially in the last 10 years since the United Nations announced the Sustainable Development Goals in 2015. The beginning of 2023 was selected as the terminal point to include the most recent academic publications to enhance the worth.

2.3. Applying exclusion criteria for initial screening

1. Book or book chapters are excluded
2. Article retrieved, references retrieved are screening related to our objectives of the study
3. Screening the abstract, and conclusion
4. Assessed full text for eligibility and quality.

2.4. Validating search result

To validate the search results, the authors repeated the search and title-based filtering steps at different times.

Applying Exclusion Criteria Final Eligibility for Review:

1. Articles that did not focus on GHRM and sustainability integration (individual and organizational levels)
2. Conference papers and
3. Review papers

2.5. Data extraction

References/authors, Title, Source title, Year of Study, applied theory, Methods, Location of the study, industry context, key finding, abstract, keywords, number of citations, and publisher are used for data extraction.

2.6. Article selection

The study applied the PRISMA model for a systematic literature review, as illustrated in [Figure 1](#), and finally selected 89 articles for synthesis. Using the keywords defined above as search strings, the preliminary study included Scopus (640) and Web of Science (503). After duplicate removal, the number of articles for title screening was 696. The abstract screening process resulted in 497 articles due to the removal of the title of the article that was not related to the objectives. After screening the abstracts, 303 articles were removed, and the number of full-text articles assessed for eligibility and quality was 194. Finally, 89 articles were selected for review based on their uniqueness, clearly stated objectives, and their significance.

2.7. Classification of articles and analysis

Articles were classified based on the objectives defined in this systematic review. A bibliographical list was developed from the 89 selected articles, and data were extracted in a file in Excel. Therefore, the data were analyzed using Excel and VOSviewer software to draw inferences.

3. Results

3.1. Meta-analysis

3.1.1. Journals

The scientific value of a study is determined by the prestigious journals in which it appears. The international ranking of journals distinguishes four main categories (Q1, Q2, Q3, and Q4). The ranking indicates how many of the best in the field the journal's metric (typically citations) is. Based on international

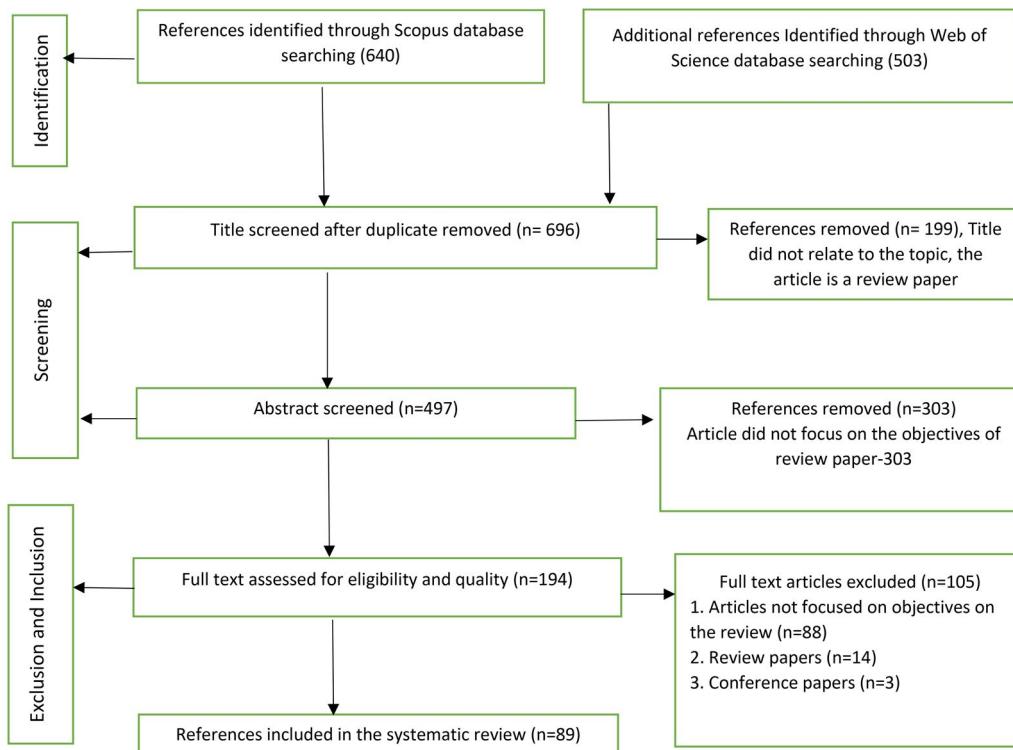


Figure 1. Systematic literature review using PRISMA.

rankings, journals with Q1 ratings have the highest scientific value. [Figure 2](#) shows the total number of articles on GHRM published in our sample between 2016 and 2023, and their distribution by Q-ranking. Moreover, [Figure 2](#) shows that most studies were published in Q1 journals. Based on the Scimago Journal Rank, the majority of the studies examined (89/87) were published in qualified journals. As shown in [Figure 2](#), there has been a rapid and recent increase in interest in GHRM. The number of publications on GHRM has significantly increased in recent years. About 63% of the 89 articles in the survey set were published in the last three years.

3.1.2. Keywords co-occurrence

The next section presents the key terms used in the selected articles on green human resource management in [Figure 3](#). The analysis was supported by the VOSviewer application, which generates links between the key terms. In [Figure 3](#), lines connect the different terms, and their strength indicates the number of publications in which the two terms occur together; thicker lines indicate a stronger link. VOSviewer determines that items are closely related when the software calculates the strengths of association between similar items, where the strength of association is 'the ratio of the total co-occurrence between items to the expected total co-occurrence between items, assuming they are statistically independent.'

The VOSviewer algorithm generated five significant keyword clusters ([Appendix 1](#)), each of which represented a group of research activities and subsequent publications. The results showed that green human resource management is an umbrella keyword, allowing the identification of related research areas, such as environmental management and environmental sustainability.

3.1.3. Underpinning theory

This chapter provides an overview of the theoretical frameworks employed in this research. Selecting the appropriate theoretical framework is critical, as it establishes the foundation of the study and directs the interpretation of the findings ([Figure 4](#)). Therefore, [Figure 4](#) shows that out of 89 papers, 62 articles applied the established theory to find the relationship between green HRM and sustainability. The remaining articles did not refer to any underlying theories. The analysis found that Ability, Motivation, and Opportunity theory (AMO) were the most prominent theories used individually (14 out of 62) to find the relationship between GHRM and organizational sustainability. According to Tóth et al. ([2020](#)), organizations can promote green behavior and sustainability by providing employees with new skills, increased motivation, and greater opportunities. This, in turn, can improve green organizational performance.

In the analysis, it was found that the Resource Based View (RBV) was applied in 8 out of 62 articles. Additionally, the empirical study of GHRM and sustainability literature prominently applies social identity



Figure 2. Distribution of studies by rating and evolution of the number of articles examined ($n=89$) (Source: Authors' design from article reviewed).

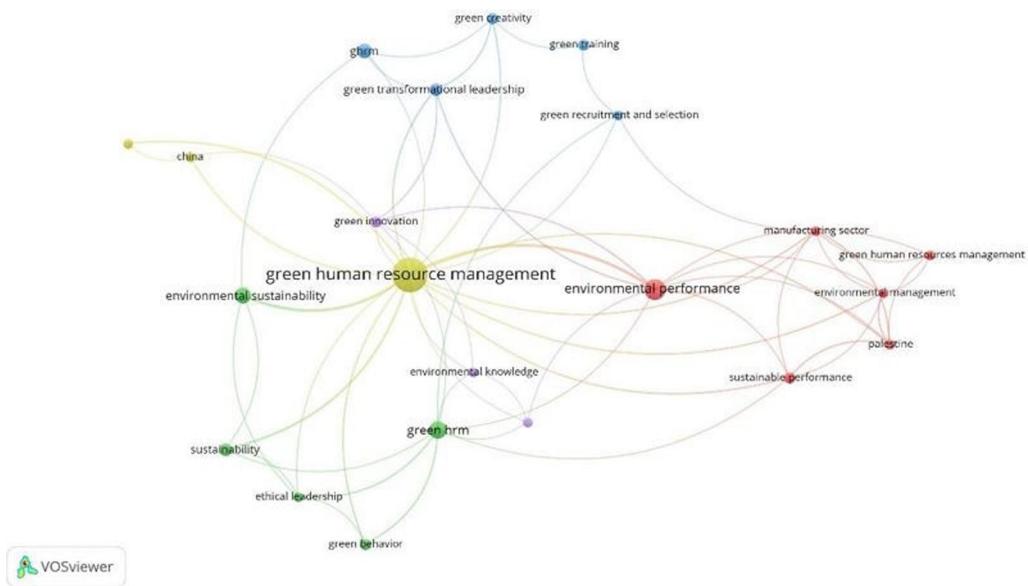


Figure 3. Keyword-occurrence in green human resources management research, 2016–2023 (Source: Authors' design from the article reviewed).

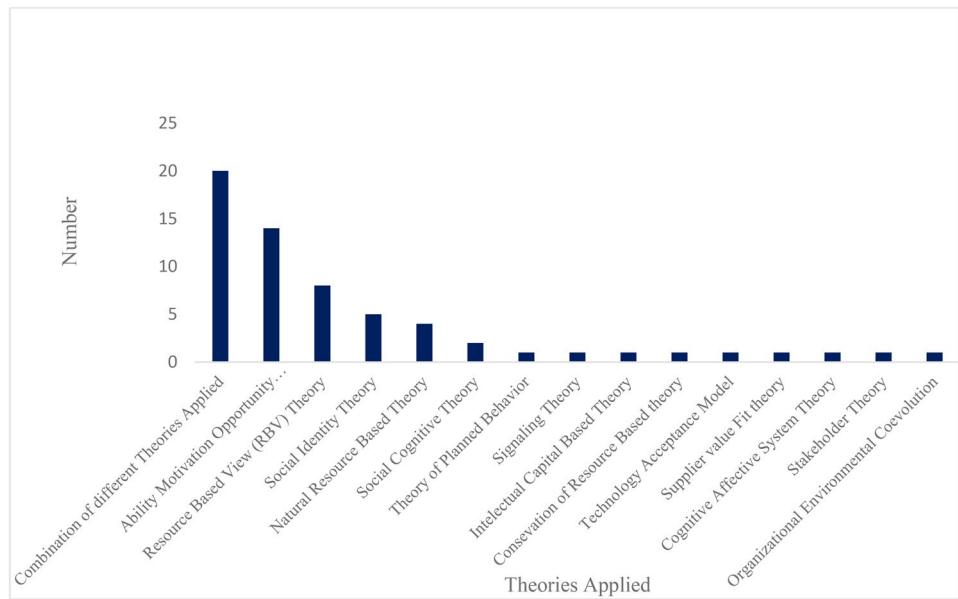


Figure 4. Underlying theory in the GHRM literature and sustainability (Source: Authors' design from articles reviewed).

theory (SIT) as a theoretical foundation for the psychological process of employees regarding a firm's green efforts. The other three most frequently used theories are the natural resource-based theory, social cognitive theory, and signaling theory. In rare cases, researchers may also apply the technology acceptance model, theory of planned behavior, supplier value fit model, intellectual capital-based theory, or norm activation model. In some articles, the authors have combined theories such as AMO plus RBV, AMO plus social exchange theory, RBV theory Plus social exchange plus positive psychology, and social cognitive theory.

3.1.4. Methods used

Various research methods were used to conduct the studies. This review article used a methodology for screening articles based on four types of research articles: conceptual papers, qualitative, quantitative, and mixed methods. Figure 5 shows that quantitative research was dominant in examining GHRM and

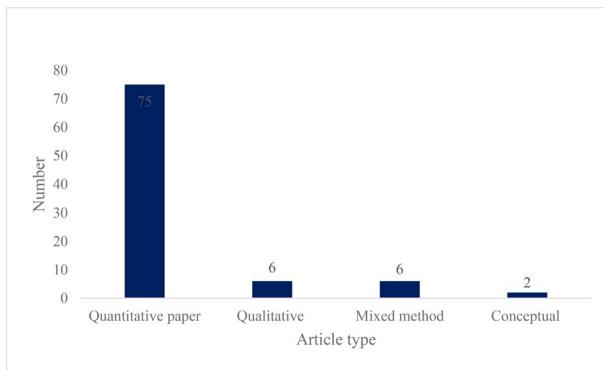


Figure 5. Distribution of methodologies (authors' design from articles reviewed).

organizational sustainability performance research during the study period (75 of 89 papers). Therefore, the design of questionnaires and surveys is the most prominent quantitative method. Furthermore, very few researchers have applied qualitative (6) or mixed (6) methods for GHRM and sustainability research. However, only two papers (2) have been published as conceptual papers. Most quantitative studies have examined the environmental performance and employee sustainable behavior outcomes of GHRM.

3.1.5. Nations and industry contexts

For this study, the countries where the examination was conducted were classified into four categories: developing, developed, cross-country (different countries), and not applicable (not specific to a particular country). The analysis reveals that most articles are published in specific national contexts, particularly in developing countries ($n=79$), with Malaysia ($n=12$), Pakistan ($n=18$), China ($n=14$), and India ($n=6$) being the regions of focus. However, only seven studies have been conducted in developed countries, particularly in European countries, such as Italy, Portugal, Spain, England, and France.

Moreover, Figure 6 also shows that the majority of the studies analyzed were in the manufacturing industry ($n=39$) and service industry ($n=26$), with very few studies based on government and nonprofit organizations. The figure also indicates that studies conducted in developed countries have primarily focused on the service industry. Developing countries are typically rapidly industrializing, and emerging economies focus more on manufacturing than developed countries. They also engage in human activities within their organizations, which can lead to ecological deterioration owing to a lack of awareness of environmental issues.

3.2. Organizational and employee-related antecedents of GHRM

After analyzing the antecedents of GHRM, the various determinants that influence the practice of GHRM in the organization were identified, as shown in Table 1. Organizational culture and leadership behaviors can play a role in the GHRM practice adoptions at the organizational level. Therefore, Islam et al. (2021) found that ethical leadership acts as a determinant of GHRM, which in turn influences green behavior. Moreover, Islam et al. (2021) found that ethical leadership is an important factor that promotes GHRM practices in the organization which influences employee's environmental citizenship behavior. Individual green values also strengthen this relationship. According to a previous study, GHRM practices mediate the impact of green transformational leadership on green innovation (Singh et al., 2020) and employees' pro-environmental behavior (Farrukh et al., 2022). Moreover, organizational environmental culture at the organizational level (Al Doghan et al., 2022; Shafaei et al., 2020), top management commitment, and environmental orientation (Zahrani, 2022) have a significant impact on the implementation of GHRM in the organizations. In addition, According to Sun et al. (2022), GHRM plays a mediating influence between green transformational leadership and environmental performance. Therefore, green transformational leadership encourages and promotes GHRM practices in the organization.

Top management commitment and CSR (Yusliza et al., 2019), green human capital and green relational capital (Yong et al., 2019b), individual knowledge toward the environment (Khatoon et al.,

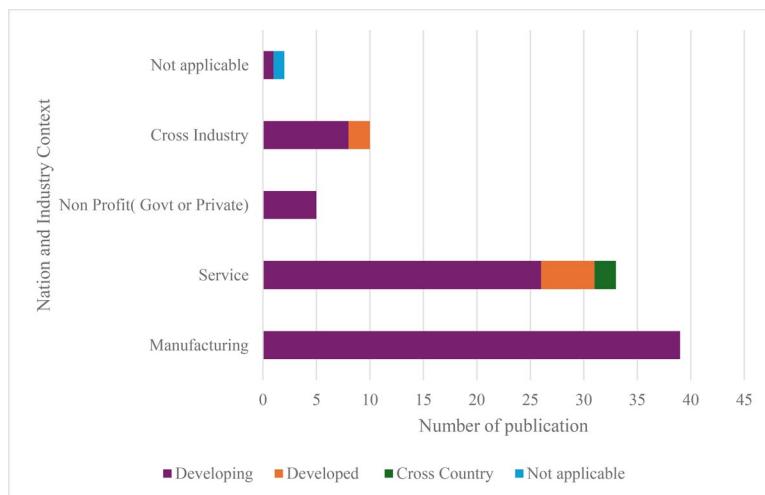


Figure 6. Nation and industry context (Source: Authors' design from article reviewed).

2021), and top management green commitment and green intellectual capital (Haldorai et al., 2022), all have a positive and significant influence on GHRM implementation in organizations. Furthermore, GHRM plays a significant mediating role between green innovation (Singh et al., 2020), customer pressure and regulatory stakeholder pressure (Guerci et al., 2016), and the environmental performance of the organization. Contrary to previous studies, according to Yong et al. (2019b), green structural capital is not significantly related to green human resource management. Moreover, green employee empowerment and HR business partner commitment do not positively influence the promotion of GHRM practices in India (Khatoon et al., 2021). Kara et al. (2023) find that organizational sustainability as an antecedent promotes GHRM practices in organizations. After analyzing the selected papers mentioned in Table 1, the authors identified the main antecedents of green HRM in Figure 7.

3.3. GHRM consequences on sustainable employee's behavioral outcomes

After analyzing the GHRM literature shown in Table 2 with regard to sustainable employee behavior outcomes, GHRM practices positively influence in-role and extra-role green behavior (Dumont et al., 2017; Rubel et al., 2021b; Ye et al., 2022; Zhang et al., 2019), voluntary green behavior (Garavan et al., 2023; Pinzone et al., 2016; Zhu et al., 2021), task-related green behavior (Zhu et al., 2021), employee green behavior (Khan et al., 2022; Sabokro et al., 2021), and personal moral norms (Fawehinmi et al., 2020). In addition, green training is treated as a key mechanism to boost employees' voluntary green behavior (Pham et al., 2019) and it is positively linked to green creativity and plays sequential mediation effects on green values and green intrinsic motivation (Wu et al., 2021). Moreover, GHRM practices also enhance pro-environmental behavior (Saeed et al., 2019), OCBE (Meng et al., 2022; Pham et al., 2019), green psychological climate/capital (Chen & Yan, 2022; Naz et al., 2023; Rubel et al., 2021a), and pro-environmental psychological capital (Saeed et al., 2019). Researchers in their findings identified the impact of GHRM on innovative behavior (Kara et al., 2023), and green creativity (Abualigah et al., 2022; Farooq et al., 2022). Other interesting sustainable behavior issues are employee organizational commitment (Shoaib et al., 2021), and green work engagement (Abualigah et al., 2022) positively influenced by GHRM practices. On the other hand, GHRM practices indirectly and positively influence sustainable employees' behaviors by mediating green knowledge sharing (Rubel et al., 2021b), information needs, personal moral norms (Fawehinmi et al., 2020), perceived insider status, perceived and perceived external status (Ye et al., 2022), corporate social responsibility and green psychological climate (Sabokro et al., 2021), green commitment (Khan et al., 2022), employees' green mindfulness (Chen & Wu, 2022), and employees' willingness to support their organization (Pinzone et al., 2016) psychological green climate (Dumont et al., 2017). On the other hand, GHRM affects organizational citizenship behavior toward environment/

Table 1. Antecedents and determinant of GHRM practices in the organizations (author's design from the article reviewed).

Authors	Findings
Yusliza et al. (2019)	Top management commitment has a significant impact on CSR and GHRM practices across all dimensions. Furthermore, this study discovered that CSR has a significant impact on green analysis and job descriptions. However, the relationship between CSR and GHRM was less significant than anticipated.
Yong et al. (2019b)	The positive impact of green human capital and green relational capital on GHRM practices is clear.
Islam et al. (2020)	Ethical leadership is a precursor that affects GHRM practices, in-role, and extra-role green behaviors. GHRM plays a mediating role between ethical leadership and green behaviors. Individual green values increase the link between green HRM methods and green behaviors.
Shafaei et al. (2020)	At the organizational level, the environmental culture of an organization is positively related to GHRM, which in turn has a positive association with the organization's environmental performance.
Khatoon et al. (2021)	The promotion of GHRM practices is positively related to individual knowledge of the environment. Additionally, GHRM practices can influence the commitment of employees toward the organization's environmental efforts (OECE).
Sun et al. (2022)	The research discovered that Green Transformational Leadership (GTL) has a direct and significant impact on environmental performance (EP). Furthermore, GHRM serves as a positive mediator between GTL and EP. Furthermore, as a moderator, Environmental Value (EV) contributes significantly to strengthening the relationship between GTL and EP.
Al Doghan et al. (2022)	The study found that the organizational environmental culture has a positive and significant impact on Green Human Resource Management (GHRM) and Green Innovation (GI). Additionally, GHRM and GI were identified as significant predictors of Environmental Sustainability (ES) and Environmental Performance (EP).
Guerci et al. (2016)	Customer and regulatory stakeholder pressure has a significant and positive impact on environmental performance. Furthermore, as a mediator, GHRM has a significant positive effect on the relationship between GHRM dimensions and environmental performance.
Farrukh et al. (2022)	Green transformational leadership and pro-environmental behavior among employees are significantly and positively related, thanks to GHRM's mediating role. Furthermore, environmental knowledge moderates the relationship's strength.
Mohtar and Rajani (2016)	There is an integration of the ability, motivation, and opportunity of employees in manufacturing organizations in Malaysia to encourage national green policy through GHRM practices
Zahrani (2022)	The study found that the activities of GHRM, top management support, and top management commitment, as well as the environmental orientation of GHRM, were positively related to green team creativity and green HRM practices. These approaches had a strong positive impact on organizational sustainability.
Singh et al. (2020)	Mediation by GHRM had a positive influence on the relationship between green transformational leadership and green innovation. GHRM indirectly affects the environmental performance of the firm through green innovation.
Haldorai et al. (2022)	Top management green commitment (TMGC) and green intellectual capital (GIC) had a direct impact on GHRM and hotel environmental performance (EP). GHRM also plays a mediating role in the relationship between TMGC and EP as well as GIC and EP.
Kara et al. (2023)	Organizational sustainability acts as an antecedent of GHRM as well as it has a significantly positive impact on GHRM and innovative behavior. Moreover, between organizational sustainability and innovative behavior, GHRM has partial mediation.
Islam et al. (2021)	In the interaction between ethical leadership and employees' environmental citizenship behavior, GHRM plays an important mediating role. Individual green values also increased the association between GHRM and employees' environmental citizenship behavior.

pro-environmental behavior by mediating green work climate perceptions/psychological green climate (Naz et al., 2023; Rubel et al., 2021a), green lifestyle (Meng et al., 2022). Furthermore, employees' green creativity is positively and significantly influenced by GHRM, but the relationship is indirect by mediating perceived organizational support (Hameed et al., 2022), green self-efficacy (Farooq et al., 2022), green work engagement (Abualigah et al., 2022) and enablers of green culture (Muisyo et al., 2022). After analyzing the selected papers mentioned in Table 2, the authors identify the main outcomes of sustainable employee behavior in Figure 7.

3.4. GHRM consequences on organizational sustainability

An analysis Table 3 mentioned GHRM literature linked to sustainability found that GHRM has a significant positive impact on environmental performance (Cheema & Javed, 2017; Muisyo & Qin, 2021; Niazi et al., 2023; Nisar et al., 2024; Roscoe et al., 2019; Sathasivam et al., 2021b; Yasin et al., 2023). On the other hand, GHRM also enhances the corporate social performance of the organization (Niazi et al., 2023; Yasin et al., 2023) and has positive effects on CSR by mediating the effects of a sustainable business environment (Cheema & Javed, 2017). Furthermore, very few studies have revealed that GHRM significantly influences business and economic performance (Marrucci et al., 2021; Opoku Mensah et al., 2021).

According to Khaskhely et al. (2022) found in the study that individual GHRM practices (Green recruitment and selection, and green pay and reward) influences positively corporate environmental and social

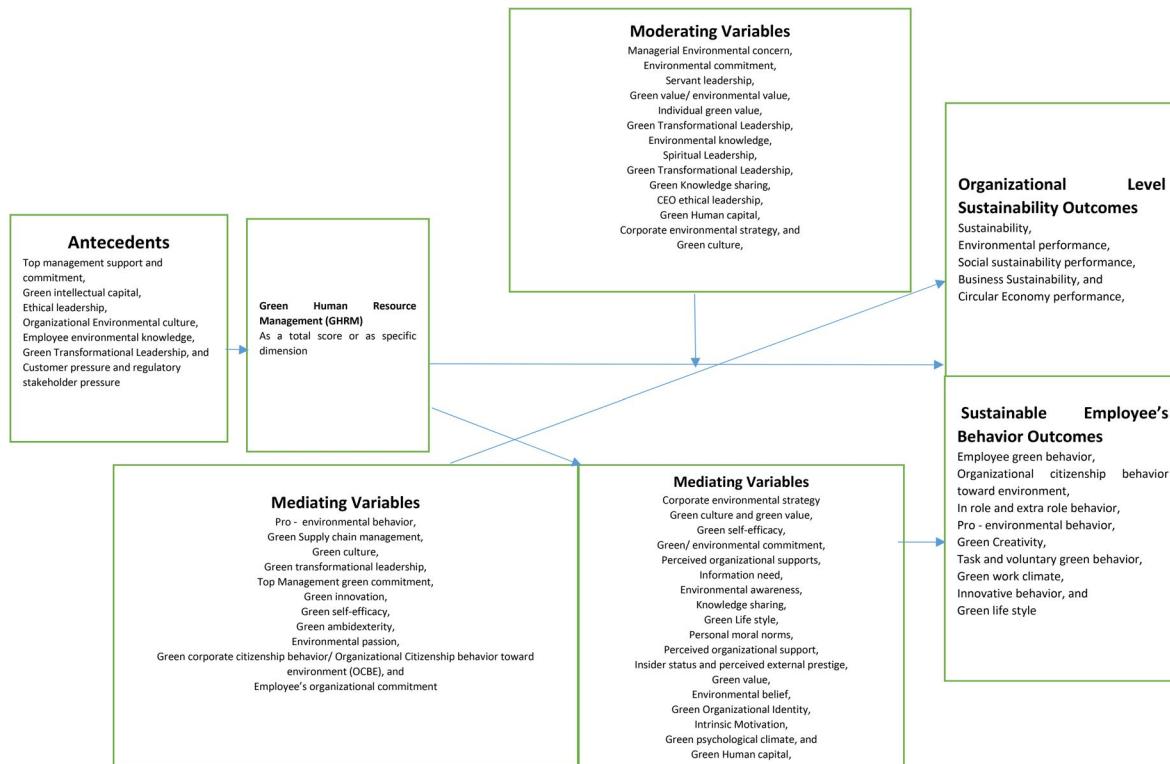


Figure 7. Synthesis of the main antecedents, mediators, moderators, and consequences of GHRM linked to sustainability by the selected papers (Source: Authors' design from article reviewed).

Table 2. GHRM consequences on sustainable employee's behavioral outcomes (author's design from the article reviewed).

Authors	Findings
Zhang et al. (2019)	Employee life cycle, education, employee empowerment, and manager participation all have a major and positive impact on employees' green behavior, both in and out of the workplace. On the other hand, rewards have a major impact only on extra-role behaviors. Furthermore, the Information function mediates the relationship between GHRM and employee green behavior.
Rubel et al. (2021b)	GHRM has significant and positive effects on green in-role and extra-role service behavior. The association between GHRM and Green Service conduct is completely mediated by green knowledge sharing, which is statistically significant.
Pham et al. (2023)	Green incentive and performance management have a substantial impact on employees' in-role green performance as well as their corporate environmental citizenship behavior. Furthermore, when hotels are managed by Western corporations, the impact of green incentives on employees' green performance and organizational citizenship behaviors for the environment is stronger.
Fawehinmi et al. (2020)	GHRM has a significant positive effect on Personal Moral Norms (PMN). Moreover, there is an indirect positive relationship between GHRM and EGB through PMN.
Ye et al. (2022)	In the case of new employees, GHRM has a direct effect on in-role and extra-role green behavior, with the mediating effects of perceived insider status and perceived external prestige.
Nawaz Khan (2023)	Moderation in GHRM had no effect on the direct or indirect link between green leadership and emotional exhaustion. However, GHRM significantly influenced the mediation of green attitude.
Zhu et al. (2021)	Voluntary green behavior (VGB) and task-related green behavior (TGB) are significantly and positively influenced by green HRM. Furthermore, environmental belief (EB) mediates the indirect relationship between GHRM and VGB. Moreover, there is also a positive relationship between GHRM and TGB by mediating green organizational identity (GOI).
Sabokro et al. (2021)	GHRM has a direct influence on employees' green behavior. Moreover, through the mediating roles of corporate social responsibility and green psychological climate, GHRM has affected employees' green behavior indirectly within Iranian industries.
Abualigah et al. (2022)	Green work engagement and green creativity will be influenced positively and significantly by green HRM practices. Furthermore, green work involvement improves the link between GHRM and green innovation. Furthermore, spiritual leadership as a moderator variable strengthens the GHRM and green work engagement relationship.
Hameed et al. (2022)	Through the mediation of perceived organizational support, GHRM has a significant influence on employee's green creativity. Green transformational leadership also moderates the association between GHRM activities and green-perceived organizational support.
Khan et al. (2022)	GHRM has an indirect effect on employee green behavior (EGB) by mediating the green commitment of the organization. Furthermore, green knowledge sharing strengthens the indirect relationship between GHRM on EGB.

(Continued)

Table 2. Continued.

Authors	Findings
Darvishmotevali and Altinay (2022a)	GHRM is positively related to task-related and proactive Pro-Environmental Performance (P-EP). Moreover, environmental awareness mediates the indirect relationship between GHRM and proactive P-EP, this relationship is not significant for task-related P-EP. Furthermore, as a moderator servant leadership is not significant in the relationship between green HRM and task-related P-EP.
Darvishmotevali and Altinay (2022b)	In both cases of task-related and proactive pro-environmental performance, GHRM has positive and significant effects. Moreover, in the relationship between GHRM and employees' tasks and proactive P-EP, connectedness to nature plays a mediating role. Furthermore, conscientiousness strengthens the relationship between green HRM and employees' proactive P-EP.
Farooq et al. (2022)	GHRM has a direct and indirect positive influence on green creativity. This indirect effect through mediation green self-efficacy. However, the finding also that moderation of Green Transformational Leadership is not significant on the indirect effect of GHRM on GC.
Chen and Wu (2022)	GHRM in the organization influences positively and significantly to employees' green mindfulness which in turn promotes their green behaviors. Moreover, to strengthen this relationship, green transformational leadership and green self-efficacy play moderating roles.
Garavan et al. (2023)	Voluntary Workplace Green Behavior (VGWB) is influenced by GHRM practices (recruitment, selection, performance management, and compensation practice). Moreover, Reflective Moral Attention (RMA) partially mediated the relationship between GHRM (except recruitment) and VGWB.
Meng et al. (2022)	GHRM influences positively and significantly green lifestyle and green organizational citizenship behavior (GOCB). Meanwhile, green lifestyle plays a mediating role in the relationship between GHRM and GOCB. Furthermore, green shared value acts moderating role between a green lifestyle and GOCB.
Pinzone et al. (2016)	GHRM Practices influenced positively voluntary behaviors toward the environment at the collective level. Moreover, employees' willingness to support environmental management (EM) endeavors partially mediates between GHRM and Voluntary behavior. The finding also conceptualizes three different types of 'Green' HRM practices.
Chen et al. (2021)	Employees perceived GHRM's influence on voluntary workplace green behaviors and green creativity positively and significantly. Additionally, between employees' perceived GHRM and voluntary workplace green behavior, green psychological climate, and harmonious environmental passion are found to partially mediate this relationship. In addition, the relationship between employees' perceived green HRM and green creativity, and harmonious environmental passion is found to fully mediate this relationship.
Muisyo et al. (2022)	GHRM practices significantly influenced individual and collective green creativity and the enablers of green culture (EGC). Moreover, environmentally specific servant leadership as moderation strengthens the relationship between GHRM and green creativity at both individual and collective levels.
Aboramadan and Karatepe (2021)	GHRM promotes hotel employees' perceptions of green organizational support (OS) which significantly enhances job performance and organizational citizenship behavior toward the organization (OCB-O).
Rubel et al. (2021a)	GHRM had a significant relationship with green work climate perceptions which in turn affects with pro-environmental behavior of employees. The relationship here is positive and significant.
Aboramadan et al. (2021)	A study of nonprofit employees discovered that GHRM is positively connected with green voice conduct, green knowledge-sharing activity, and green assisting behavior. Furthermore, Perceived Organizational Supports serve as a mediator in these relationships.
Naz et al. (2023)	Green HRM practices and corporate environmental policy have a favorable impact on the psychological green climate, which encourages employees to engage in pro-environmental actions. Further, environmental knowledge as moderation improves the relationship between pro-environmental behaviors and environmental performance.
Shoaib et al. (2021)	Green recruitment and selection, green training, and development promote organizational commitment. Furthermore, green human capital plays a mediating role in the relationship.
Dumont et al. (2017)	GHRM both directly influenced in-role green behavior. Moreover, GHRM also influences indirectly in-role and extra-role green behavior through the mediating role of psychological green climate. Individual green values did not modify the influence of green HRM or psychological green atmosphere on in-role green behavior.
Huo et al. (2022)	GHRM practices (GRS, GT, and GPR) lead to a green work climate (GWC), and green work engagement (GWE). Moreover, GWC promotes employee green behavior and green performance in the organizations.
Saeed et al. (2019)	GHRM practices promote employees' pro-environmental behavior, and in this relationship, pro-environmental psychological capital plays a mediating role. Moreover, employees' environmental knowledge As a moderation effect stronger the link between HRM practices on pro-environmental behavior.
Wu et al. (2021)	Green training promotes green creativity in the organization. Moreover, green values and green intrinsic motivation sequentially mediate this relationship.
Yuan et al. (2023)	GHRM promotes Voluntary Workplace Green Behavior (VWGB) through environmental commitment and discouraging VWGB through emotional exhaustion. Meanwhile, supervisory support for environmental behaviour mitigates the negative effects of GHRM on emotional exhaustion as well as the relationship between GHRM and VWGB of employees via emotional exhaustion.
Pham et al. (2019)	GHRM practices have a direct impact on Organizational Citizenship Behavior toward the environment (OCBE). The combination of three GHRM practices—training, performance management, and employee involvement—can encourage employees to engage in voluntary green behavior. However, this is dependent on the level of green performance management and green employee participation. Furthermore, green training is regarded as an important mechanism for improving employees' voluntary green behavior.
Chen and Yan (2022)	Green Psychological Capital (GPC) partially mediates the relationship between GHRM and Green Organizational Pride (GOP). Moreover, GPC also partially mediates the relationship between Green transformational leadership (GTL) and GOP.

Table 3. Organizational level sustainability outcomes of GHRM (author's design from the article reviewed).

Author	Findings
Cheema and Javed (2017)	To promote sustainable environments in the organization, GHRM has a significant positive influence on it. Furthermore, GHRM has a positive contribution to CSR by creating a sustainable business environment.
Zaid et al. (2018)	GHRM practices have a direct effect on sustainable performance. Furthermore, between GHRM and sustainable business performance, GSCM plays a mediating role in the relationship.
Roscoe et al. (2019)	GHRM has significant positive effects on environmental performance. Furthermore, there is also a significant influence of GHRM on the enabler of green Culture.
Gilal et al. (2019)	The findings that GHRM and environmental performance are positively and significantly related. Moreover, GHRM promotes environmental performance positively and significantly through employees' environmental passion. In addition, individual green values as moderation.
Ren et al. (2020)	GHRM indirectly influences firms' environmental performance while top management's (TMT) green commitment fully mediates this relationship. Moreover, the relationship between GHRM and TMT's green commitment is strengthening when CEO ethical leadership.
Yafi et al. (2021)	Green training has a direct relationship with green environmental performance, green competencies, and green motivations. Furthermore, there is also an indirect positive effect of green training on environmental performance through mediating both green competencies and motivations.
Muisyo and Qin (2021)	GHRM enhances green or environmental performance significantly. On the other, green innovation enhances a firm green performance.
Al-Swidi et al. (2021)	Environmental concern, GHRM, and green leadership conduct have all contributed positively to the promotion of green organizational culture, which has a good and significant impact on employees' green behavior and corporate environmental performance. The relationship here is mediated by the green organizational culture.
Nisar et al. (2024)	GHRM contributes positively ensuring to promote the environmental performance of hospitality organizations. Moreover, HR can boost green self-efficacy positively the green behavior which in turn promotes hotel environmental performance.
Irani et al. (2022)	GHRM enhances the environmental performance of the hospitality industry when employees' environmental commitment and green process innovations are confirmed.
Mohammed and Fisal (2023)	A study of Iraqi educational institutions found that GHRM(green recruitment promotes the sustainability of the organization while their strategic excellence acts as a mediator.
Yasin et al. (2023)	GHRM enhances corporate environmental sustainability significantly which in turn promotes corporate social sustainability that also encourages employer branding of the organization.
Niazi et al. (2023)	GHRM promotes green corporate social responsibility(GCSR). Furthermore, there is no significant relationship between GHRM and environmental performance (EP). Moreover, GCSR as a mediating role indirectly affects on the relationship between GHRM and EP. Finally, green transformational has moderation effects on this relationship.
Rehman et al. (2021)	GHRM and green intellectual capital are not directly related to environmental performance. Furthermore, Green Intellectual Capital and GHRM have impact on environmental performance through mediating green innovation.
Yong et al. (2020)	Organizational sustainability has been influenced significantly by both green recruitment and green training. However, green analysis and job description, green selection, green performance assessment, and green reward were insignificant to sustainability.
Úbeda-García et al. (2022)	Green High Performance work system enhances green ambidexterity which in turn promotes environmental performance in the hospitality organizations.
Obeidat et al. (2023)	Green strategic intention enhances significantly GHRM practices in the organizations which in turn, positively influences green empowerment in the circular economy. Moreover, the circular economy has an influence positively on sustainable performance. So, in between green HRM and sustainable performance, the circular economy plays a mediating role.
Opoku Mensah et al. (2021)	GHRM influences positively on green corporate citizenship Behavior (GCC), green reputation, environmental performance, and business performance (BPs) were significantly influenced by GHRM. In addition, the relationship between GHRM and BP is indirect through GCC and green reputation which has a partial mediation role. Therefore, GCC mediates the relationship between GHRM and EP.
Khatoon et al. (2022)	All GHRM practices significantly promote environmental sustainability. Moreover, among all GHRM activities green compensation and rewards impact mostly on promoting environmental sustainability.
Ahmed et al. (2021)	GHRM practices promote hotels' environmental performance. Moreover, GHRM indirectly influences EP through green culture and environmental responsibility. In addition, when individuals show green values and green responsibility for their environment then GHRM and environmental relationships can be more strong.
Paillé et al. (2020)	Training is considered as most effective green HRM practice in enhancing individual environmental performance. Furthermore, perceived organizational environmental support only strengthens the impact of individual environmental performance when individuals are highly motivated by the organization's environmental participation.
Marrucci et al. (2021)	GHRM positively promotes the organization performance of EMAS-registered organizations. Furthermore, GHRM advances the transition to a circular economy without being affected by external factors such as market demand, competitor commitment, or technology support for circularity.
Khaskhely et al. (2022)	Corporate sustainable performance is positively and influenced significantly by GHRM and dynamic sustainable capabilities.
Kim et al. (2019)	GHRM practices enhance employees' organizational commitment, eco-friendly behavior, and environmental performance of the hotel.
Nisar et al. (2022)	GHRM practices influence positively pro-environmental psychological capital which has a serial influence on the psychological green climate and pro-environmental behaviors. Moreover, employees' pro-environmental behaviors contribute significantly to boosting the hotel's environmental performance.
Sathasivam et al. (2021b)	HR managers played an important role in promoting environmental sustainability in the automobile industry. Furthermore, the automotive industry's GHRM policies were confined to environmental training and development, green awards, green employee involvement, and green orientation.

(Continued)

Table 3. Continued.

Author	Findings
Umran et al. (2022)	GHRM practices promote organizational attractiveness. Moreover, between green HRM and organizational attractiveness, environmental performance and organizational reputation sequentially mediate this relationship.
Cabral and Chiappetta Jabbour (2020)	Green training is significantly and positively related to environmental performance. In addition, green competencies play a mediating role in this relationship. Further, there is also a mediating effect of proactive environmental management maturity between training and environmental performance. Moreover, environmental commitment acts as a moderating role.
Muisyo et al. (2021)	GHRM practices are positively influencing the enabling environment of green culture (EGC). Moreover, GHRM also promotes Green competitive advantages through EGC.

performance. Moreover, GHRM promotes sustainability in organizations (Mohammed & Fisal, 2023; Zaid et al., 2018). In addition, green recruitment and selection, green performance management, green training and development, green compensation and rewards, and green welfare practices significantly promote environmental sustainability. Moreover, among all GHRM activities green compensation and rewards impact mostly on promoting environmental sustainability (Khatoon et al., 2022). A few researchers have found that green training has a significant influence on environmental performance (Cabral & Chiappetta Jabbour, 2020; Yafi et al., 2021) and the best predictor of environmental performance (Paillé et al., 2020). A study by Yong et al. (2020) found surprisingly that organizational sustainability (economic, social, and environmental) has been influenced significantly by both green recruitment and green training. However, green analysis and job description, green selection, green performance assessment, and green reward were insignificant to sustainability.

Furthermore, GHRM indirectly influences the environmental performance of the organization by mediating environmental passion (Gilal et al., 2019), top management green commitment (Ren et al., 2020), green organizational culture (Al-Swidi et al., 2021), green self-efficacy (Nisar et al., 2024), employee environmental commitment and green process innovation (Irani et al., 2022), Green corporate social responsibility (Niazi et al., 2023), green innovation (Rehman et al., 2021), green corporate citizenship behavior (Opoku Mensah et al., 2021), and green culture and environmental responsibility (Ahmed et al., 2021). There is also a finding of an indirect effect of the circular economy on the link between GHRM and sustainable performance (Obeidat et al., 2023). After the analysis of the selected papers mentioned in **Table 3**, the authors identify the main outcomes related to organizational sustainability in **Figure 7**.

3.5. Implementation level of GHRM

Table 4 shows that organizations are required to implement GHRM activities (environmental training, green recruitment, performance appraisal, employee involvement, and compensation) to encourage pro-environmental behavior (Mishra, 2017). According to Gupta (2018), green training and development are the most important activities, followed by green empowerment and involvement are ranked as second. Furthermore, the GHRM was implemented at a moderate level. According to Masri and Jaaron (2017), the implementation of GHRM is at a moderate level to ensure environmental performance in manufacturing organizations. Furthermore, in a study of the restaurant chain of European subsidies in the USA, three subsidiaries of restaurants (UK, Germany, and Sweden) have waste separation facilities, recycling waste, and various levels of environmental training and energy measurement (Haddock-Millar et al., 2016). After analyzing all the selected papers (89), the authors also identified the mediation and moderating variables in **Figure 7**.

4. Discussion

Overall, our literature review revealed how organizational and employee-related factors affect GHRM implementation in organizations. Moreover, how do GHRM practices implement and promote sustainability at the individual and organizational levels? These review findings are summarized based on the objectives or research questions. *Based on RQ1:* Research works on GHRM showed a chronological trend. The number of publications on GHRM has significantly increased in recent years. Moreover, the study period started in

Table 4. Implementation of GHRM (author's design from the article reviewed).

Author	Findings
Mishra (2017)	The result identified the status of environmental training, green recruitment, performance appraisal, and employee compensation as GHRM functions. Moreover, implementation of all activities of green HRM practices to promote pro-environmental behavior in enterprises where top management support and mutual learning are crucial.
Gupta (2018)	The findings that Green Training and Development (GTD) have been identified as the most important variable for organizational environmental management. Moreover, Green Empowerment and Involvement (GEI) is considered second-ranked. The next important criterion of GHRM is the Green Pay and Reward System (GPR).
Bombiak and Marciniuk-Kluska (2018)	The assessment of the impact of individual Green HRM activities on sustainable business development and their practical implementation has a strong positive relationship. The more the evaluation of the impact of a specific activity higher the level of application of GHRM in the Polish company.
Moraes et al. (2018)	Among all GHRM activities, only environmental training has a positive impact on eco-efficiency. This study found an interesting outcome that training may be negatively affected without the support of the empowerment and teamwork.
Jerónimo et al. (2020)	Organizational rationale for sustainability is mainly based on green hiring, and to a lesser degree, on green training. Green hiring is particularly crucial for older employees, whereas young employees need more green training. Surprisingly, green compensation is not significant sustainability.
Mousa and Othman (2020)	There was moderate level implementation of GHRM practices. Moreover, 'green hiring', 'green training, and "involvement" were the utmost influencing factors. In addition, 'green performance management and compensation' were the least affecting factors. The study revealed that GHRM had a positive impact on sustainable performance, where environmental sustainability had the highest impact and social performance had the lowest influence.
Napathorn (2022)	Organizations successfully implemented GHRM practices in the context of their institutional and cultural contexts. The study found that green recruitment and selection can be used to enhance employer branding. Green training can be used to build awareness, provide on-the-job training, job shadowing, coaching, mentoring, and improve workplace climate. Green pay and rewards can be used to implement financial and nonfinancial incentives. Finally, green employee relations can be used to promote a paternalistic leadership style and improve workplace climate.
Elshaer et al. (2023)	GHRMPs greatly improved individuals' green values and job happiness. Furthermore, individual green values and job happiness boosted the organization's inventive performance.
Ogbeibu et al. (2020)	Green team creativity is influenced positively and significantly by technological turbulence, green recruitment and selection, and green training, involvement, and development. Moreover, the study found that green performance and compensation have a negative impact on team creativity.
Munawar et al. (2022)	GHRM promotes green innovation of organizations while green human capital and environmental knowledge play a significant mediation role. Furthermore, managerial environmental concern (MEC) as a moderator strengthens the relationship between GHRM and green human capital.
Haddock-Millar et al. (2016)	A study was conducted on the European subsidiaries of a restaurant chain in the USA. It was found that three of the subsidiaries have waste separation facilities and recycle waste, such as cooking oil, for bio-diesel fuel. Furthermore, there were various types pes of environmental training and energy measurement at the restaurant level throughout the subsidiaries.
Sathasivam et al. (2021a)	NGOs, organizational culture, and effective communication are key factors that help in GHRM implementation to ensure environmental sustainability goals. This finding is guiding implications for other developing countries that are making efforts to achieve environmental sustainability goals by GHRM.
Masri and Jaaron (2017)	The implementation level of GHRM practices is moderate. In addition, GHRM practices have a significant positive relation with environmental performance (EP). The importance of this paper is to identify, prioritize, and validate the GHRM practices that promote EP in manufacturing organizations.

2012, but the GHRM for sustainability research started in 2016, as shown in [Figure 2](#). The increase in publications on green HRM-linked sustainability began in 2016 and has continued until the present due to the growing interest in environmental sustainability for competitive advantage and also due to the government's regulations, environmental activists, and non-governmental organizations' concerns about the ecological matter among organizations (Yong et al., 2020). Furthermore, the UN Sustainable Development Summit in New York in 2015 focused on promoting human participation in the workforce to ensure environmental sustainability (Yong et al., 2020). Furthermore, in terms of journal quality, the majority of the articles were published in high-quality journals and published in Q1 journals had the highest number, as shown in [Figure 2](#). Analyzing the keywords for finding keyword co-occurrence that green human resource management is an umbrella keyword and in sustainability issues environmental management and environmental sustainability are the major areas of research already done in the recent years, as shown in [Figure 3](#). In our analysis, it was also found that the ability motivation theory (AMO) is the dominant theory and other prominent underpinning theories are resource-based view theory, natural resource-based theory, and social identity theory, as shown in [Figure 4](#). The results shown in [Figure 5](#) reveals that among the surveyed

articles, the maximum number of articles published applying quantitative and very few papers used qualitative and mixed methods, but only two papers were conceptual. Our analysis also found that quantitative papers are used to identify the implementation level of GHRM for sustainability. The results shown in [Figure 6](#) that most of the studies were conducted in the context of developing countries, where Pakistan, Malaysia, China and India are the dominant regions of GHRM research, while the manufacturing industry is dominant. Among the service industry, most of the studies related to the tourism industry ($n=18$ out of 26 service industries). Tourism plays an important role in sustainability and brand building (Kálmán & Grotte, [2023](#)). This result is also supported by a study of GHRM bibliometric analysis showed that 63% of selected papers examine the manufacturing sector and 37% (Ren et al., [2018](#)) of papers examine the service sector (Jaškevičiūtė et al., [2024](#); Khan & Muktar, [2020](#)). According to Benevne and Buonomo ([2020](#)) found that 90% of the papers selected for review of GHRM are in the context of emerging countries especially Asian and South American countries.

4.1. Based on RQ2

Among the antecedents, ethical leadership, green transformational leadership, organizational environmental values and culture, top management commitment, and organizational environmental orientation have played significant roles in promoting GHRM adoption in the organization. This review extends the knowledge that these factors influence the successful implementation of GHRM. Moreover, green organization culture is one of the foundations upon which GHRM practices are built and planned (Kim et al., [2019](#)). On the other hand, according to Ren et al. ([2018](#)), GHRM is influenced not only by common organizational actors such as leaders and employees but also by multiple stakeholders such as teams, municipalities, regulators, and legislators, who exert pressure on the adoption of GHRM. Moreover, organizational culture and effective communication (Sathasivam et al., [2021a](#)), the institutional and cultural context (Napathorn, [2022](#)) are vital in supporting green HRM implementation for sustainability.

4.2. Based on RQ 3

After the analysis of green HRM studies related to sustainable behavior outcomes, the study of eco-friendly behavior is dominant (employee in the role or extra-role green behavior; task-related or voluntary green behavior; OCBE, pro-environmental behavior). In addition, a review study found that GHRM influences both employee green behavior and organizational performance in the same model (Ahmad, [2015](#)).

4.3. Regarding RQ 4

After analyzing the GHRM outcomes on organizational sustainability and keyword co-occurrence, the majority of the research was aimed at finding the GHRM and environmental sustainability outcomes. However, the other two dimensions of corporate social sustainability and financial outcomes are few or overlooked. This finding is supported by Fachada et al. ([2022](#)) in the study of GHRM bibliometric analysis that in terms of keywords mapping showed that environmental performance and environmental management are dominant in the environmental management cluster. Moreover, GHRM has an impact on organizational environmental performance and is given priority but the financial performance is not overlooked (Yong et al., [2020](#)). In addition, a previous study found that social sustainability is the least explored research area in comparison with economic and environmental dimensions of sustainability (Amrutha & Geetha, [2020](#)).

4.4. Addressing RQ 5

Findings also showed that green hiring, training, and involvement are the most influential factors. On the other hand, GHRM has the highest impact on environmental performance and the lowest impact on social sustainability (Mousa & Othman, [2020](#)). This study also extends to the existing literature that green HRM practices have been implemented in the organization at a moderate level.

4.4.1. Theoretical implications

The findings of this study suggest relevant contributions for researchers and academics interested in a more comprehensive approach to green HRM and sustainability, particularly in cases where identifying the level of implementation of GHRM for sustainability is of concern. For researchers, first, as there are few studies on qualitative and mixed methods, more studies should be conducted on mixed methods for identifying implementation level, conceptual development, and empirical research. Furthermore, the use of the mixed method reduces the limitations of relying on a single research method and provides more information and accurate findings. Furthermore, this approach also enhances the reliability and validity of the findings, although it may require more effort and resources.

Second, more empirical studies should be conducted in the future in developed countries to ensure more relevant results are also supported by Yong et al. (2019a) in the previous study. Moreover, other industries, governments, and nonprofit organizations require further empirical examination to validate the model, which is also supported by Benevene and Buonomo (2020) in their study. As lack of empirical studies in the service industry, there should be more empirical research on the service industry specifically healthcare, education, and the banking industry as a limited study in the areas.

Third, as there are very few studies in the area of social sustainability and economic performance, more studies should be conducted in these dimensions of sustainability. In addition, as there are very few studies on the GHRM on circular economy performance, more studies should be conducted on this topic. Moreover, the integration of GHRM, big data, and industry 4.0 and organizational sustainability needs to be addressed and examined in the future (Pham et al., 2020).

Fourth, AMO, RVB, and social identity theories are applied repeatedly and provide valuable contributions to how GHRM affects individual behavior and organizational sustainability outcomes. This review extends new knowledge that currently psychological theories are also involved in GHRM research, such as social cognitive theory, cognitive affective system theory, and social learning theory. Therefore, it is imperative to adopt more psychological and behavior theories to better understand the behavior and psychological mechanism to ensure workplace greening. Therefore, in the future, researchers should concentrate more on psychological issues, such as pro-environmental psychological capital, psychological green capital, and green self-efficacy, by applying different psychological theories, such as social cognition theory, cognitive-affective system theory, and social learning theory.

In addition, as most of the antecedents are related to the organizational level, more focus should be placed on individual-level antecedents. It is suggested that the antecedents of GHRM should be further developed, particularly those at the employee level (Obeidat et al., 2020). In this era of information, big data management, validating the antecedents of GHRM implementation found by Yong et al. (2020) need to be investigated and integration of GHRM, technology based issues and circular economy could be an interesting area for further research (Pham et al., 2020).

Moreover, few studies have identified the implementation level and recommendations for implementation. Therefore, more studies should focus on the implementation of GHRM practices. However, GHRM literature is limited in this regard. Hence, further research should be conducted on the skills and competencies that HR professionals need to design and implement GHRM (Bahuguna et al., 2023). Therefore, organizations must prioritize the successful implementation of GHRM practices that align with their strategic goals to achieve sustainable advantages while also promoting the sustainable use of operational resources, such as electricity, water, and paper which will be reducing operational costs.

4.4.2. Practical implications

The study's findings provide practical implications for HR managers and organizations. The findings also suggest that HR managers can better understand that green training and involvement are the most crucial and execute accordingly to implement green practices for ensuring sustainability in the organization. Moreover, HR managers can also design hiring, training, employee involvement, and performance management and rewards programs based on environmental issues. This study could be a guideline for HR managers about the main determinants for enhancing the GHRM practice in the organization. Suppose, ethical leadership, green transformational leadership, organizational environmental values, and culture are essentials for GHRM practices and encouraging sustainable behavior in the organization. So, HR managers might also concentrate on how to shape employee green behavior to ensure sustainability

in the organization. This study also helps HR managers to understand organizational sustainability dimensions and formulate policy to balance these economic, social, and environmental dimensions which are important. Moreover, ethical behavior, green transformation leadership, top management commitment to greening the workplace, organizational culture and values, and regulatory stakeholder pressure are important for the implementation of GHRM practices. So managers and HR professionals should concentrate on ensuring these issues for the adoption of GHRM in the organization.

The results are also relevant to policymakers and other stakeholders such as the government and society. Nowadays, the Government of every country is more concerned about sustainability issues, especially in organizational sustainability, because of the huge carbon emissions from the industry. This study helps policymakers understand and develop organizational sustainability policies by collaborating with NGOs and organizations for the sustainable use of resources and environmental protection policies in the organization. This study helps policymakers understand the worth of GHRM practices for sustainability issues and frame rules and regulations accordingly. Such practices can also reduce waste and redundancy and minimize environmental impact, enabling employees to make significant impacts on organizational performance and environmental sustainability (Faisal, 2023) which ultimately benefits society and makes them more conscious of the environment.

5. Conclusion

In conclusion, this review research found that different GHRM practices have significant contributions to enhancing organizational sustainability (economic, social, and environmental) performance. Among the sustainability dimensions, most of the empirical studies showed that GHRM plays a significant contribution to enhancing environmental performance at the organizational level. So more empirical research should be done to find the impact of GHRM on economic and social sustainability performance. Moreover, organizational culture and leadership are also important for adopting GHRM practices in the organization. In addition, GHRM not only improves organizational sustainability performance directly but also GHRM, specifically training, rewards and employee involvement are vital to shaping the employee's behavior to ensure the workplace is greener. Researchers, practitioners, and policymakers can benefit from the synthesis of this current review result. Despite the increasing trend of GHRM research in recent years, this current comprehensive systematic review of GHRM based on sustainability its antecedents, and implementation level, the finding also clarifies what GHRM means to managers and employees, its requirements, how it affects the organization's sustainability and employees' daily sustainable behavior, as well as how GHRM manages organizational and individual needs and motivation. These findings can help organizations define policies and strategic goals by integrating GHRM and sustainability issues in the organizations. Moreover, this study guides managers and employees to better understand that an employee's sustainable behavior is crucial to ensuring organizational sustainability, as well as the organization's green culture, leadership, and top management support for greening, are also worthy.

5.1. Limitations and future research directions

However, it is important to note that this study has limitations. First, it is based solely on the online databases Scopus and Web of Science, excluding other potentially relevant sources, such as books and other online databases. Future studies should also consider a wider range of databases and books. Second, as eligibility criteria non-English were excluded, potentially resulting in the loss of important information, ongoing studies, and sustainability relationships. In particular, it is plausible that non-English research would have an important contribution to this study. Thirdly, we also excluded conference papers that could have important findings as many national and international conferences in this area for sustainability purposes. We recommend including conference papers in the review in the future. Additionally, it should be acknowledged that the study did not include review articles, which may have contained valuable information on GHRM research. Despite efforts to consider all eligible studies based on the selection criteria, some information and outcomes may have been missed. Therefore, future studies should include review papers. Future research should expand the scope to include these areas. In addition, the review focuses solely on GHRM and sustainability research and does not consider other areas

of GHRM research such as circular economy performance. Moreover, this review based on a specific time period 2012 to March, 2023 is another limitation. So, future researchers can change the period. Finally, this review is based on the overall industrial context not limited to specific industries like service or manufacturing. So in the future, the review may be on specific industries like tourism, hospitals, pharmaceuticals, etc. to find the gap in that specific industry. Finally selecting the final paper for synthesis may create potential biases.

Authors' contributions

Masum Miah: Conceptualization, methodology, investigation, data curation, writing–original draft, software. Gábor Szabó-Szentgróti: Conceptualization, Methodology, Investigation, Validation, Writing - Original Draft, Writing - Review and Editing. Virág Walter: Methodology, Formal analysis, Investigation, Writing - Original Draft, Writing - Review and Editing.

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Data available on request from the authors.

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Appendix 1.

Clusters	Keywords
1	environmental management
	environmental performance
	green human resources management
	manufacturing sector
	Palestine
	sustainable performance
2	environmental sustainability
	ethical leadership
	green behavior
	green hr
3	sustainability
	GHRM
	green creativity
	green recruitment and selection
4	green training
	green transformational leadership
	china
5	employee green behavior
	green human resource management
	environmental knowledge
	green innovation
	pro-environmental behaviors