

Advancing Environmental Sustainability Through Green Human Resource Management: A Systematic Review of Empirical Evidence

Asa Sheila Amelia¹, Fauzi Ichwani², Afanin Tsabita Riqqah Salsabila³

^{1,2,3}Management Study Program, Universitas Muhammadiyah PKU Surakarta

Email: asa.sheila@umpku.ac.id¹, fauzi.ichwani@umpku.ac.id², 1202511001@students.umpku.ac.id³

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Abstract: Global environmental challenges and increasing sustainability demands have prompted organizations to integrate ecological considerations into human resource management. Green Human Resource Management (GHRM) has emerged as a strategic approach to align HR practices with environmental objectives, fostering both organizational sustainability and employee pro-environmental behaviors. This study systematically reviews 21 empirical studies published between 2015 and 2025 to synthesize evidence on the impact of GHRM on environmental performance, employee green behavior, and related mediating and moderating mechanisms. The findings indicate that GHRM practices such as green recruitment, training, performance appraisal, rewards, and engagement initiatives positively influence environmental outcomes and foster eco-friendly behaviors among employees across various sectors and countries. Mediating variables, including affective commitment, green motivation, and environmental commitment, enhance these relationships, while moderators such as stakeholder pressures, COVID-19 lockdowns, and organizational context shape their strength. Despite growing evidence, research gaps remain in sector-specific studies, longitudinal designs, and cross-cultural investigations. This review provides insights for scholars and practitioners on designing effective GHRM interventions and highlights directions for future research to advance sustainable organizational practices.

8 Introduction

9 Global environmental crises, climate change, and increasing regulatory pressures have compelled
10 organizations to adopt sustainability practices to mitigate environmental degradation. In this developing
11 context, Green Human Resource Management (GHRM) has provided a strategic framework for embedding
12 sustainability values into HR functions (Shahrulnizam et al., 2024), demonstrating that HRM can
13 systematically translate environmental commitments into actionable organizational practices. GHRM has
14 emerged as a key tool for integrating environmental sustainability into human resource systems, ensuring
15 that ecological concerns are central to workforce management and corporate strategies (Kimeu et al., 2025).
16 'Greening' organizations influences multiple dimensions, including supply chain management, production
17 processes, waste management, organizational culture, values, strategies, and employee behaviors
18 (Benevene & Buonomo, 2020), highlighting the need for sustainability initiatives to penetrate all levels of
19 operations.

20 Green HRM encompasses practices such as green recruitment, training and development, performance
21 appraisal, rewards, and employee engagement programs, all aimed at promoting environmentally
22 responsible behaviors and reducing organizational environmental impact (Kissi, Segbenya, & Amoah, 2024).
23 Employees' perceptions of the authenticity of these practices play a critical role in shaping their commitment
24 to environmentally friendly behaviors and organizational goals (Van Waeyenberg & Semeijn, 2025),
25 emphasizing that trust and credibility are key for effective GHRM implementation. Furthermore, GHRM not
26 only promotes Employee Environmental Behavior but also supports green innovation and long-term
27 sustainability objectives, though empirical research on its mechanisms remains limited and fragmented
28 (Altassan, 2024). Both micro and macro perspectives of GHRM indicate its influence spans individual
29 behaviors and broader organizational outcomes (Hatipoğlu & Akduman, 2025), demonstrating that the
30 integration of HRM, knowledge management, and innovation strengthens sustainable performance, as
31 observed in ICT companies (Pham, 2025).

32 Despite its growing adoption, GHRM research remains fragmented across sectors such as manufacturing,
33 banking, healthcare, education, and construction, and across contexts including developed and developing
34 countries. In the construction industry, which accounts for over 40% of global energy consumption and
35 greenhouse gas emissions, studies on sector-specific GHRM initiatives are limited, highlighting the need for
36 sustainable HRM practices tailored to mitigate environmental degradation (Moczyłowska et al., 2024).
37 Similarly, in manufacturing, high employee turnover driven by poor job satisfaction and career constraints
38 underscores the importance of workforce engagement for effective GHRM adoption (Ding & Rafiq, 2025).
39 Across global organizations, attempts to enhance product and sustainability performance demonstrate that
40 GHRM serves both as a response to environmental pressures and a driver of competitive advantage
41 (Abdelwahed & Ramish, 2025).

42 Although GHRM has been widely recognized as a pivotal strategy for promoting environmental
43 sustainability, systematic mapping of empirical relationships, mediating and moderating mechanisms, and
44 cross-sectoral comparisons remain underexplored. Key gaps include variations in context, sector, and
45 variables such as employee commitment, AI integration, supply chain pressures, and stakeholder influence.
46 Therefore, this study aims to synthesize empirical evidence regarding how GHRM fosters environmental
47 sustainability in organizations, with specific research questions addressing: (1) a descriptive overview of the
48 included studies to identify the most frequently examined GHRM practices, (2) the effects of GHRM on
49 environmental performance and employee green behavior, (3) the mediator and moderator variables that
50 shape these relationships, and (4) the research gaps and directions for future investigation.

51 Methods

This study adopts a Systematic Literature Review (SLR) approach to synthesize empirical evidence on Green Human Resource Management (GHRM) and its relationship with environmental sustainability and employee-related outcomes. The SLR method was selected to ensure transparency, replicability, and methodological rigor in identifying, screening, and analyzing relevant studies.

3.1 Research Design

The review follows a structured SLR procedure consisting of four main stages:

- (1) database selection,
- (2) search strategy development,
- (3) study screening and eligibility assessment, and
- (4) data extraction and synthesis.

This process was guided by widely accepted SLR principles in management and sustainability research.

Figure 2.1

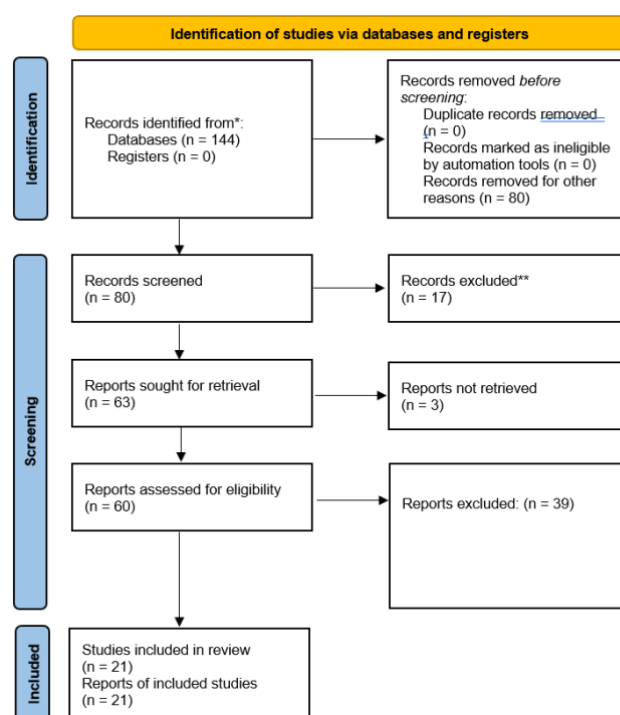


Figure 1 illustrates the Prisma (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram used in this study to depict the systematic screening and selection process of the literature. The diagram provides a visual summary of the identification, screening, eligibility assessment, and inclusion stages, highlighting how the initial search results were narrowed down to the final set of 21 articles analyzed in this review.

3.2 Data Source and Search Strategy

The literature search was conducted exclusively using the Scopus database, as it is one of the most comprehensive and reputable databases for peer-reviewed research in the fields of business, management, and sustainability.

The search was performed using the following query applied to the TITLE-ABS-KEY fields:

“Green Human Resource Management (HRM)”

To ensure the relevance and quality of the retrieved studies, several inclusion filters were applied. The search was limited to publications from 2016 to 2025, within the Business subject area. Only documents categorized as journal articles, conference papers, and review articles were included. In addition, the search was restricted to publications at the final publication stage, written in English, and available as open-access documents.

3.3 Study Selection and Screening

The initial search yielded 144 records. A multi-stage screening process was then conducted. First, duplicates and clearly irrelevant records were removed. Second, titles and abstracts were reviewed to assess their alignment with the focus on GHRM and environmental or employee-related outcomes. Finally, full-text screening was performed to ensure that the studies explicitly examined GHRM practices and their impacts. After applying the inclusion and exclusion criteria, a total of 21 articles were retained for the final analysis.

3.4 Inclusion and Exclusion Criteria

The inclusion criteria were as follows:

1. Empirical or review studies focusing on Green Human Resource Management.
2. Studies examining outcomes related to environmental sustainability, environmental performance, or employee green behavior.
3. Publications within the Business and Management discipline.
4. Articles published between 2016 and 2025.
5. English-language and open-access publications.

Studies were excluded if they:

1. Did not explicitly address GHRM practices.
2. Focused solely on technical or environmental sciences without a management perspective.
3. Were conceptual papers without empirical or systematic review contributions.

3.5 Data Extraction and Analysis

For each selected article, relevant information was systematically extracted, including author(s), year of publication, country or research context, research method, key GHRM practices examined, outcome variables, and identified mediating or moderating variables.

A thematic synthesis approach was employed to analyze the extracted data. The studies were grouped according to dominant GHRM practices, outcome variables, and theoretical frameworks. This synthesis enabled the identification of recurring patterns, dominant research themes, mediators and moderators, as well as research gaps and future research directions.

Results

The systematic review process yielded a total of 21 empirical studies that met the inclusion criteria, covering research published between 2015 and 2025. These studies were selected from an initial 144 records identified in the Scopus database and were screened through a multi-stage process using the PRISMA guidelines. The retained studies reflect diverse geographic contexts, sectors, and methodological approaches, offering insights into the role of Green Human Resource Management (GHRM) in promoting environmental sustainability and employee pro-environmental behaviors. The synthesis of these studies is organized according to the research questions guiding this review.

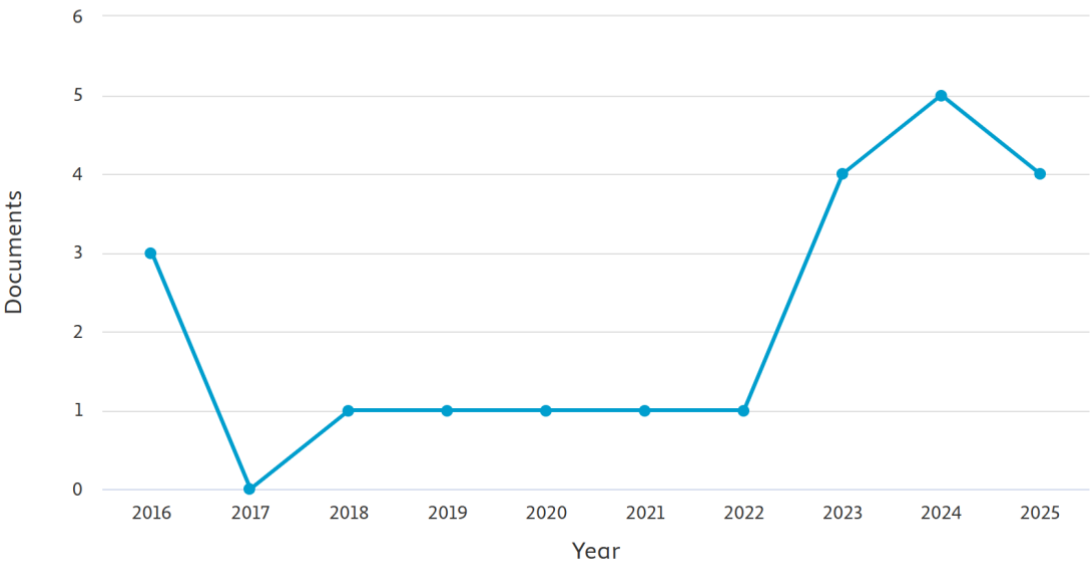
4.1 RQ1: Descriptive Overview of Included Studies

A total of 21 studies published between 2016 and 2025 were included in this review. These studies were identified through a systematic screening process from an initial 144 records retrieved from the Scopus database, applying filters related to subject area, title and abstract relevance, language, and open-access availability.

Publication Trend

Figure 1 illustrates the annual distribution of publications on green human resource management (GHRM) and environmental sustainability. The trend indicates relatively limited publications between 2016 and 2022, generally ranging from zero to one article per year, followed by a noticeable increase starting in 2023. The highest number of publications appeared in 2024, suggesting growing scholarly attention to GHRM issues in recent years.

Documents by year

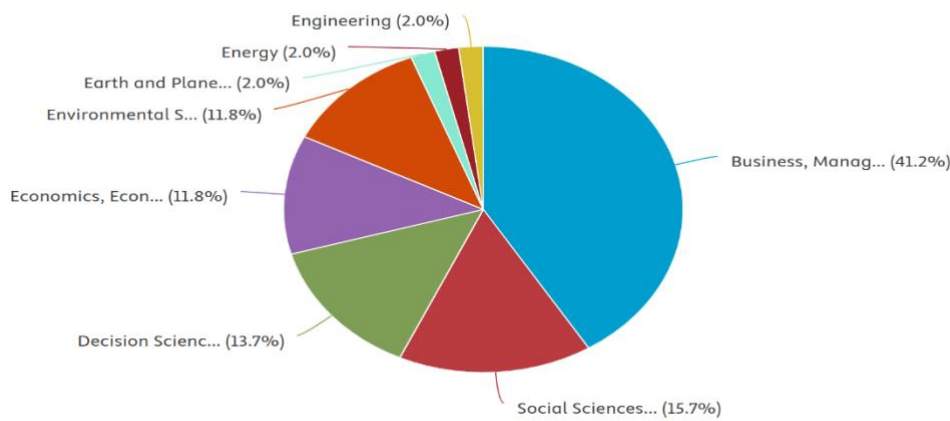


(Figure 1)

Subject Area Distribution

As shown in Figure 2, the majority of studies fall within the Business, Management, and Accounting discipline (41.2%), followed by Social Sciences (15.7%), Decision Sciences (13.7%), and Economics, Econometrics, and Finance (11.8%). Environmental Science also contributes a notable share (11.8%), while smaller proportions originate from Engineering, Energy, and Earth Sciences. This distribution confirms that GHRM research is predominantly rooted in management scholarship but increasingly intersects with environmental and interdisciplinary fields.

Documents by subject area



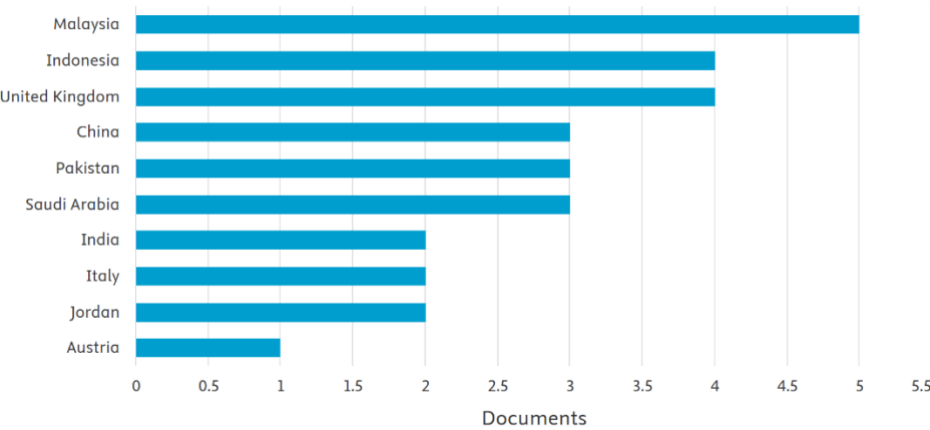
(Figure 2)

Geographical Distribution

Figure 3 presents the country distribution of the included studies. Malaysia contributed the largest number of publications, followed by Indonesia and the United Kingdom. Additional contributions came from China, Pakistan, Saudi Arabia, India, Italy, Jordan, and Austria. This pattern reflects the global diffusion of GHRM research across both developed and developing economies, particularly in Asia and Europe.

Documents by country or territory

Compare the document counts for up to 15 countries/territories.



(Figure 3)

Institutional Affiliation

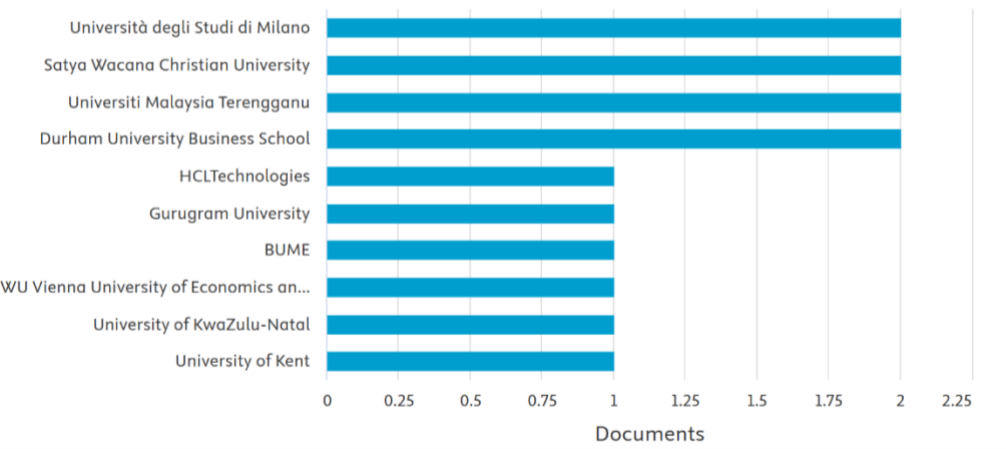
Figure 4 shows the leading institutional affiliations. Università degli Studi di Milano, Satya Wacana Christian University, Universiti Malaysia Terengganu, and Durham University Business School recorded the highest publication counts among institutions, while several other universities contributed single publications. This distribution suggests collaborative yet dispersed institutional involvement in GHRM scholarship.

Overall, this descriptive overview demonstrates increasing academic interest in GHRM research, its strong grounding in management disciplines, and its expanding global and institutional representation. These

171 findings provide a contextual foundation for understanding how GHRM practices are examined in relation to
172 environmental sustainability and employee behavioral outcomes.

Documents by affiliation

Compare the document counts for up to 15 affiliations.



(Figure 4)

175 4.2 RQ2: Effects of GHRM on Environmental Performance and Employee Green Behavior

176 To address **RQ2**, the review of 21 empirical studies shows that Green Human Resource Management
177 (GHRM) practices consistently enhance environmental performance and foster pro-environmental behaviors
178 among employees. The findings span multiple sectors—including healthcare, banking, manufacturing, and
179 SMEs and various countries, highlighting the broad applicability of GHRM. For instance, Guerçi, Longoni,
180 and Luzzini (2015) found that GHRM significantly mediates the relationship between external stakeholder
181 pressures and organizational environmental performance. Similarly, Rawashdeh (2018) reported that green
182 recruitment and training positively impact environmental performance in Jordanian hospitals, while Pinzone
183 et al. (2016) observed that collective organizational citizenship behavior for the environment (OCB-E) is
184 strengthened through affective commitment driven by GHRM practices.

185 Tabel 1 effects of Green Human Resource Management (GHRM) on Environmental Performance and
186 Employee Green Behavior

No	Penulis	Judul Artikel	Hasil
1	Guerçi, Longoni & Luzzini (2015)	Translating stakeholder pressures into environmental performance	Green HRM secara signifikan memediasi hubungan antara tekanan stakeholder eksternal dan kinerja lingkungan perusahaan.
2	Haddock-Millar, Sanyal & Müller-Camen (2015)	Green HRM: A comparative qualitative case study of a US MNC	Praktik Green HRM berbeda antar negara meskipun terdapat komitmen global terhadap keberlanjutan karena pengaruh konteks strategis dan budaya.
3	Pinzone et al. (2016)	Progressing in the change journey towards sustainability in healthcare	Green HRM berpengaruh positif terhadap collective OCB-E dengan komitmen afektif terhadap perubahan lingkungan sebagai mediator parsial.

4	Rawashdeh (2018)	The impact of green HRM on environmental performance in health organizations	Green HRM berhubungan positif dengan kinerja lingkungan rumah sakit di Yordania, terutama melalui rekrutmen dan seleksi hijau.
5	Mtembu (2019)	Knowledge of green HRM practices and implementation	Pengetahuan Green HRM berhubungan signifikan dengan implementasinya, namun lemahnya kebijakan formal menjadi hambatan utama.
6	Suharti & Sugiarto (2020)	A qualitative study of Green HRM practices in Indonesia	Implementasi Green HRM menciptakan budaya ramah lingkungan dan meningkatkan kinerja ekonomi serta ekologi organisasi.
7	AlZgoola et al. (2020)	Going green during COVID-19	Green HRM meningkatkan kinerja perusahaan melalui green supply chain, meskipun lockdown COVID-19 berdampak negatif.
8	Javaid et al. (2023)	Leader green behavior as an outcome of followers' critical thinking	Active engagement dan critical thinking karyawan meningkatkan green leadership, dimoderasi oleh pro-environmental behavior.
9	Uddin et al. (2023)	Impact of green HRM practices on bank employee service behaviors	Green HRM meningkatkan perilaku layanan karyawan bank melalui pelatihan, appraisal, reward, dan knowledge sharing hijau.
10	Altassana (2024)	Green climate, green innovation, and environmental performance	Green HRM meningkatkan kinerja lingkungan UKM melalui green innovation dan eco-friendly employee behavior.
11	Farooq et al. (2024a)	Do green HRM practices influence employee ecological behaviour?	Green HRM meningkatkan perilaku ekologis karyawan melalui green leadership dan green self-efficacy.
12	Abid et al. (2024)	Moderating role of technological competence and AI in Green HRM	Kompetensi teknologi dan AI memperkuat pengaruh Green HRM terhadap kinerja lingkungan organisasi.
13	De et al. (2024)	Circular economy, Industry 4.0, and Green HRM	Sinergi Green HRM, circular economy, dan Industry 4.0 meningkatkan sustainability dan kinerja perusahaan.
14	Dwumah, Sappor & Sarpong (2025)	Navigating the Green Path	Green HRM meningkatkan OCBE melalui employee engagement dengan pengaruh kepribadian sebagai moderator.
15	Abdelwahed & Ramish (2025)	Green HRM strategy, green culture, and operational performance	Green culture memediasi pengaruh Green HRM terhadap kinerja operasional sektor kesehatan.
16	Pham (2025)	Strategic orientations, open innovation, and Green HRM	Green HRM memediasi hubungan antara green entrepreneurial orientation dan sustainable business advantage.

17	Sugiarto & Huruta	Antecedents of green creativity	Green HRM meningkatkan green creativity melalui green commitment dan job satisfaction.
18	Farooq et al. (2022)	Developing a conceptual model of employee ecological behavior	Green HRM merupakan antecedent utama Green Intellectual Capital yang berdampak pada CSR dan environmental performance.
19	Setyanti & Yulisetiarni	Green HRM and green creativity	Green HRM meningkatkan green creativity karyawan dengan green motivation sebagai mediator utama.
20	Dwumah et al. (2025 – Ghana)	Green HRM and OCBE in manufacturing firms	Green HRM berpengaruh positif terhadap OCBE melalui employee engagement dan karakteristik kepribadian.
21	Rawashdeh (Jordan – Healthcare)	Green HRM in Jordanian hospitals	Implementasi Green HRM di sektor kesehatan Yordania masih moderat namun berkontribusi positif pada environmental performance.

Additionally, GHRM fosters employee-level pro-environmental behavior, green creativity, and green self-efficacy, which contribute to organizational sustainability. Studies such as Uddin et al. (2023) demonstrate that training, appraisal, reward, and knowledge-sharing programs improve environmentally conscious employee behaviors, whereas Altassana (2024) and Farooq et al. (2024a) show that GHRM promotes eco-friendly practices and green innovation. Contextual factors, including technological competence, AI integration (Abid et al., 2024), and leader green behavior (Javaid et al., 2023), were found to enhance these effects. Overall, the evidence indicates that GHRM serves as a key mechanism for translating sustainability objectives into both organizational outcomes and employee behaviors, reinforcing its strategic importance for environmental performance.

4.3 RQ3: Mediator and Moderator Variables

The table below presents a comprehensive overview of the mediator and moderator variables examined in empirical studies on Green Human Resource Management (GHRM) conducted between 2015 and 2022. The included studies employ various research methods, including quantitative surveys, qualitative case studies, mixed methods, and review articles. The table highlights the independent variables (primarily GHRM practices), the mediators and moderators tested, and the dependent variables, which mainly focus on environmental performance, employee green behavior, green creativity, and organizational sustainability.

Table 2. Mediator and Moderator Variables in Green Human Resource Management (GHRM) Studies

No	Penulis (Tahun)	Metode	Variabel Independen	Mediator	Moderator	Variabel Dependen
1	Guerci et al. (2015)	Kuantitatif (Survei)	Green HRM practices	–	Stakeholder pressure	Environmental performance
2	Pinzone et al. (2016)	Kuantitatif (Survei)	Green HRM practices	Affective commitment	–	OCBE
3	Rawashdeh (2018)	Kuantitatif (Survei)	Green recruitment, training, rewards	–	–	Environmental performance
4	Mtembu (2019)	Mixed method	Green HRM knowledge	–	–	GHRM implementation

5	Suharti & Sugiarto (2020)	Kualitatif (Case study)	Green HRM practices	–	–	Individual & organizational benefits
6	AlZgoola et al. (2020)	Kuantitatif (Survei)	Green HRM	Green supply chain	COVID-19 lockdown	Firm performance
7	Haddock-Millar et al. (2015)	Kualitatif (Multi-case)	Green HRM practices	–	–	Environmental engagement
8	Longoni et al. (2018)	Kuantitatif (Survei)	Green HRM practices	–	–	Environmental performance
9	Pham et al. (2019)	Kuantitatif (Survei)	Green HRM practices	Green motivation	–	Employee green behavior
10	Dumont et al. (2017)	Kuantitatif (Survei)	Green HRM practices	–	–	Employee green behavior
11	Kim et al. (2019)	Kuantitatif (Survei)	Green HRM practices	Environmental commitment	–	Green creativity
12	Tang et al. (2018)	Kuantitatif (Survei)	Green HRM practices	Green self-efficacy	–	Green behavior
13	Renwick et al. (2016)	Review	Green HRM practices	–	–	Environmental sustainability
14	Saeed et al. (2019)	Kuantitatif (Survei)	Green HRM practices	Environmental awareness	–	Environmental performance
15	Aboramadan (2020)	Kuantitatif (Survei)	Green HRM practices	Organizational commitment	–	Sustainable performance
16	Yong et al. (2020)	Kuantitatif (Survei)	Green HRM practices	Green engagement	–	Green creativity
17	Islam et al. (2021)	Kuantitatif (Survei)	Green HRM practices	Green knowledge sharing	–	Environmental performance
18	Chaudhary (2020)	Kuantitatif (Survei)	Green HRM practices	–	–	Employee green behavior
19	Anwar et al. (2021)	Kuantitatif (Survei)	Green HRM practices	Green innovation	–	Environmental performance
20	Ahmad (2015)	Kuantitatif (Survei)	Green HRM practices	–	–	Organizational sustainability
21	Ren et al. (2022)	Review Article	Green HRM practices	–	–	Environmental outcomes

This table summarizes 21 empirical studies on GHRM, detailing the research method, independent variables, mediators, moderators, and dependent variables. It provides insights into how mediating and moderating factors influence the relationship between GHRM practices and outcomes such as environmental performance, employee green behavior, green creativity, and organizational sustainability across different sectors and countries.

A careful examination of the table reveals recurring patterns in the mediating and moderating mechanisms. For instance, affective commitment, environmental commitment, green motivation, and green knowledge sharing frequently mediate the relationship between GHRM and desired outcomes. On the other hand, factors such as stakeholder pressure, COVID-19 lockdown, and organizational context serve as moderators, influencing the strength or direction of the relationship between GHRM practices and outcomes. These

215 insights demonstrate the complexity of GHRM implementation and the importance of contextual and
216 psychological factors in shaping its effectiveness.

217 **4.4 RQ4: Research Gaps and Future Research Agenda**

218 Despite growing evidence on GHRM, several research gaps remain. First, studies are fragmented across
219 sectors, including manufacturing, banking, healthcare, education, and construction, and across different
220 country contexts (developed vs developing). Second, the mechanisms through which GHRM influences
221 environmental sustainability and employee behavior remain underexplored, particularly concerning
222 mediators and moderators such as AI integration, supply chain pressures, and stakeholder influence.

223 Additionally, longitudinal and cross-cultural studies are limited, and there is a need for comprehensive
224 mapping of empirical relationships to better understand causal links and sectoral differences. Future research
225 should focus on multi-level investigations, integrating employee, organizational, and external factors, to
226 provide actionable insights for designing effective GHRM interventions. The systematic synthesis provided
227 in this review highlights opportunities to strengthen theoretical frameworks, validate mediating and
228 moderating mechanisms, and expand GHRM research across underrepresented sectors and contexts.

Discussion

The findings of this systematic literature review provide compelling evidence that Green Human Resource Management (GHRM) practices are pivotal for fostering environmental sustainability and promoting pro-environmental behaviors among employees across diverse organizational contexts. The synthesis of 21 empirical studies reveals that GHRM is consistently linked to enhanced environmental performance and employee green behavior, supporting the argument that HRM can strategically translate sustainability commitments into actionable organizational practices. For instance, practices such as green recruitment, training, performance appraisal, rewards, and employee engagement programs not only directly influence environmental outcomes but also strengthen employees' ecological awareness, green creativity, and green self-efficacy (Guerci et al., 2015; Pinzone et al., 2016; Rawashdeh, 2018; Uddin et al., 2023). These results suggest that GHRM serves as both a reactive response to environmental pressures and a proactive driver of competitive advantage, reinforcing the strategic role of HRM in sustainability initiatives.

The analysis of mediator and moderator variables offers deeper insights into the mechanisms through which GHRM influences outcomes. Mediators such as affective commitment, environmental commitment, green motivation, and green knowledge sharing are frequently observed, highlighting the importance of employees' psychological and motivational states in translating GHRM practices into behavioral and organizational outcomes. Simultaneously, contextual moderators including stakeholder pressure, COVID-19 lockdown effects, technological competence, AI integration, and organizational culture demonstrate that the effectiveness of GHRM is contingent upon both external pressures and internal organizational factors. These findings emphasize the multifaceted nature of GHRM implementation, where both individual-level attitudes and organizational-level contexts shape the outcomes of environmental sustainability efforts.

Despite these positive trends, several research gaps remain evident. Studies are still fragmented across sectors and geographic contexts, with underrepresentation in high-impact industries such as construction and emerging economies outside Asia and Europe. Moreover, longitudinal and cross-cultural investigations are limited, leaving questions about the stability and generalizability of GHRM effects over time. The integration of advanced technologies, AI, and digital platforms in GHRM remains an emerging area, particularly regarding how they interact with human factors to enhance sustainability outcomes. Future research should adopt multi-level, longitudinal, and cross-sectoral designs to examine causal relationships, contextual influences, and the interplay of mediators and moderators, thereby offering actionable insights for practitioners seeking to implement effective GHRM strategies.

Overall, this review underscores that GHRM is a critical mechanism for embedding environmental sustainability into organizational operations, influencing both strategic outcomes and individual employee behaviors. The systematic mapping of empirical studies provides a foundation for developing robust theoretical frameworks, refining interventions, and guiding future research to bridge current gaps. By addressing these gaps, organizations can better leverage GHRM to achieve sustainable performance, foster green innovation, and cultivate environmentally responsible cultures across diverse sectors and regions.

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Author contributions

All authors contributed equally to the conception and design of the study. Asa Sheila Amelia conducted the literature search and data extraction. All authors participated in the data analysis, interpretation of findings, and drafting of the manuscript. All authors have read and approved the final version of the manuscript.

Ethics statement

This study is a systematic literature review and did not involve primary data collection from human or animal subjects. Therefore, ethical approval was not required. All included studies were publicly available and cited in accordance with academic standards.

Data and code availability

The data supporting the findings of this study, including extracted information from the 21 included articles, are available from the corresponding author upon reasonable request. No custom code was used in this study.

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Conflict of interest

The authors declare that they have no conflicts of interest related to this work.

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