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Green Human Resource Management and Environmental Sustainability: A Bibliometric Analysis and Systematic Literature Review

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Abstract

The growing urgency of environmental sustainability has positioned Green Human Resource Management (GHRM) as a pivotal research domain in organizational and management studies. This study presents a comprehensive bibliometric analysis and systematic literature review (SLR) of GHRM research published in Scopus-indexed journals, drawing upon a corpus of 50 peer-reviewed articles spanning 2016 to 2025. Using bibliometric indicators—including publication trends, citation analysis, keyword co-occurrence, and authorship patterns—alongside a thematic synthesis of study findings, this paper maps the intellectual landscape of GHRM scholarship. The analysis reveals an accelerating growth in GHRM publications post-2020, driven by increasing regulatory pressures and the global sustainability agenda. Four dominant research clusters are identified: (1) GHRM practices and employee green behavior; (2) GHRM and organizational environmental performance; (3) mediating and moderating mechanisms in GHRM–outcome relationships; and (4) sector-specific and contextual applications of GHRM. The AMO (Ability–Motivation–Opportunity) framework dominates theoretical discourse, while PLS-SEM predominates methodologically. Research concentrates in manufacturing and hospitality sectors in developing economies, particularly Asia and the Middle East. Critical gaps include insufficient longitudinal designs, limited cross-cultural analyses, and the underexplored intersection of GHRM with digital transformation. This paper contributes a comprehensive research roadmap for future GHRM scholarship and offers actionable implications for HR practitioners integrating sustainability into human capital strategies.

Keywords: Green Human Resource Management; Environmental Sustainability; Bibliometric Analysis; Systematic Literature Review; Employee Green Behavior; AMO Theory; Organizational Performance

1. Introduction

The convergence of escalating environmental crises, tightening regulatory frameworks, and shifting stakeholder expectations has compelled organizations to embed sustainability at the core of their strategic operations. Within this landscape, Green Human Resource Management (GHRM) has emerged as a critical organizational lever—linking human capital strategies to environmental goals and positioning employees as active agents of ecological change [32]. GHRM encompasses environmentally oriented practices across the entire HR value chain, including green recruitment and selection, green training and development, green performance appraisal, green compensation and rewards, and green employee involvement [1].

Academic interest in GHRM has grown substantially over the past decade, with Scopus-indexed publications reflecting a marked increase from 2019 onward. This growth is attributable to converging forces: the global adoption of the United Nations Sustainable Development Goals (SDGs), the recognition that human behavior is central to organizational environmental performance, and the proliferation of theoretical frameworks—including the AMO (Ability-Motivation-Opportunity) theory, stakeholder theory, and the Resource-Based View (RBV)—that provide robust conceptual grounding for GHRM inquiry [4, 10, 26].

Despite the burgeoning literature, the field remains fragmented. Studies vary widely in their theoretical grounding, methodological approaches, sectoral focus, and geographic concentration, making it difficult to synthesize insights coherently or identify the most pressing research frontiers. Bibliometric analysis, combined with a systematic literature review, offers a powerful methodological pairing to address this challenge: bibliometrics provides a macro-level, quantitative mapping of the intellectual structure of a field, while SLR enables a qualitative, in-depth thematic synthesis [15, 28].

This study responds to three interrelated research gaps. First, while individual bibliometric analyses of GHRM exist [11], none simultaneously integrates a comprehensive thematic synthesis of recent publications (2016–2025) alongside citation and co-occurrence analysis. Second, the field lacks a unified account of GHRM's theoretical pluralism. Third, cross-sectoral and cross-regional comparisons remain underdeveloped. This paper addresses these gaps through four research questions: (RQ1) What are the publication and citation trends in GHRM research? (RQ2) What are the dominant thematic clusters? (RQ3) What theoretical frameworks have been applied? (RQ4) What research gaps and future directions does the extant literature suggest?

2. Theoretical Background

2.1 Conceptualizing GHRM

Green Human Resource Management (GHRM) refers to the application of HRM policies and practices that promote environmental sustainability within organizations [32]. GHRM has been defined as "the HRM aspects of environmental management," encompassing all activities involved in developing, implementing, and maintaining a system that aims at making employees environmentally conscious [18]. Unlike traditional HRM, GHRM explicitly integrates ecological objectives into HR systems, aiming to cultivate employee green behavior, enhance environmental performance, and contribute to corporate sustainability.

Five core GHRM practice domains are consistently identified in the literature: (1) green recruitment and selection; (2) green training and development; (3) green performance management; (4) green compensation and rewards; and (5) green employee involvement and empowerment [1, 6, 8]. More recent conceptualizations incorporate digital dimensions through E-HRM and smart technology integration [13, 27].

2.2 Theoretical Frameworks

GHRM scholarship draws on a rich plurality of theoretical perspectives. The AMO (Ability-Motivation-Opportunity) theory has emerged as the most widely applied framework, positing that employee performance is a function of ability, motivation, and opportunity—applied to GHRM, green HR practices must simultaneously build environmental competencies, foster green motivation, and create structural opportunities for sustainable behavior [4]. Stakeholder theory frames GHRM as an organizational response to diverse stakeholder demands [10, 14]. The Resource-Based View (RBV) frames green human capital as a strategically valuable, inimitable organizational resource underpinning competitive advantage [21, 20]. Contingency theory suggests GHRM effectiveness is contingent on organizational size, industry type, and national culture [26].

3. Research Methods

3.1 Research Design

This study employs a mixed-method bibliometric-SLR design, combining quantitative bibliometric analysis with qualitative thematic synthesis [28]. The bibliometric phase maps the structural and intellectual characteristics of the GHRM literature, while the SLR phase synthesizes the substantive findings of included studies. This integrated approach is increasingly advocated in management research as a means of achieving both breadth and depth [15].

3.2 Data Collection and Screening

The primary data source is the Scopus database, selected for its comprehensive coverage of peer-reviewed management and sustainability journals. The search strategy employed Boolean operators applied to title, abstract, and keyword fields: ("Green Human Resource Management" OR "Green HRM" OR "GHRM") AND ("sustainability" OR "environmental performance" OR "green behavior"). The search was conducted in September 2025. Inclusion criteria required: (1) peer-reviewed journal articles; (2) explicit focus on GHRM as a primary construct; (3) English language; (4) Scopus indexing. After screening, a final corpus of 50 articles was retained and exported in RIS format.

3.3 Analytical Procedure

Bibliometric analysis was conducted along three dimensions: (1) performance analysis examining publication trends, journal distribution, authorship patterns, and citation metrics; (2) keyword co-occurrence analysis to identify dominant research themes; and (3) citation analysis examining intellectual foundations. The SLR was conducted in accordance with PRISMA guidelines, with data extracted using a structured coding template capturing study context, theoretical framework, research design, key variables, and principal findings. Thematic synthesis was performed both inductively and deductively, guided by the AMO framework.

4. Results and Discussion

4.1 Publication Trends

Figure 1 illustrates the annual publication trend in GHRM research from 2016 to 2025. The temporal distribution reveals a clear upward trajectory with two distinct phases: a foundational phase (2016–2019) characterized by seminal conceptual contributions, and an expansion phase (2020–2025) marked by sharp acceleration in empirical applications. A critical inflection point is observed from 2020 onward, coinciding with the intensification of global sustainability discourse and the catalytic effect of the COVID-19 pandemic on organizational sustainability reassessment. The cumulative publication count reaches 50 articles by September 2025, with the highest single-year output recorded in 2024 ($n=9$).



Figure 1. Annual Publication Trend in GHRM Research (2016–2025). Bars indicate annual publications; line indicates cumulative count.

4.2 Geographic Distribution

Figure 2 presents the geographic distribution of GHRM studies. The analysis reveals pronounced concentration in developing economies, particularly South and Southeast Asia, the Middle East, and Africa. Pakistan emerges as the most frequently studied context ($n=8$), followed by Saudi Arabia and Jordan ($n=5$ each), and the UAE and China ($n=4$ each). This pattern reflects both the heightened environmental pressures in rapidly industrializing economies and the growing institutional research capacity of universities in these regions. Studies from developed economies, while foundational—particularly the 2016 UK/European cluster—are proportionally underrepresented in the post-2020 literature.

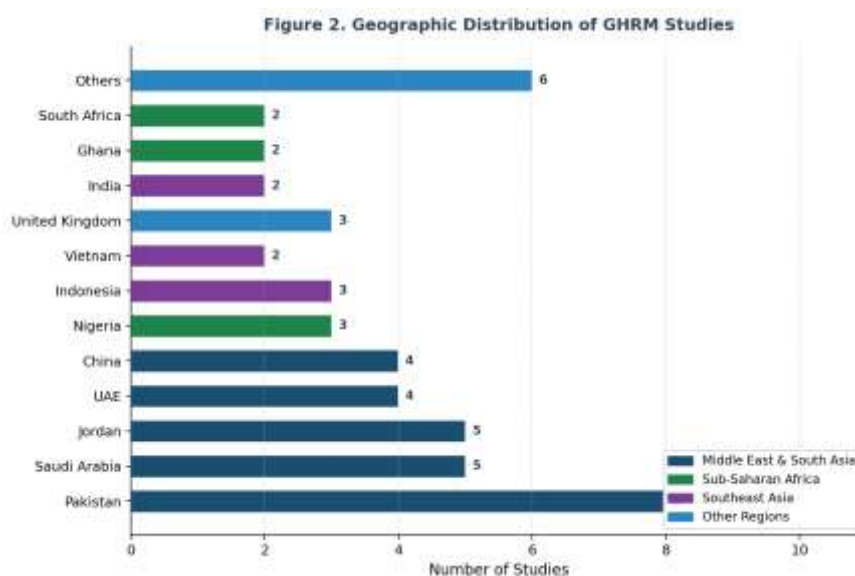


Figure 2. Geographic Distribution of GHRM Studies ($n=50$). Study counts by country/region.

4.3 Theoretical Framework Distribution

Figure 3 displays the distribution of theoretical frameworks applied across the corpus. AMO theory is the most widely employed framework, appearing in 28% of studies, underscoring its enduring utility as an explanatory lens for GHRM-behavior relationships. The Resource-Based View (20%) and Stakeholder Theory (16%) are the next most common theoretical anchors. Notably, 20% of studies do not explicitly specify a theoretical framework, a methodological limitation that constrains cumulative theoretical development in the field.

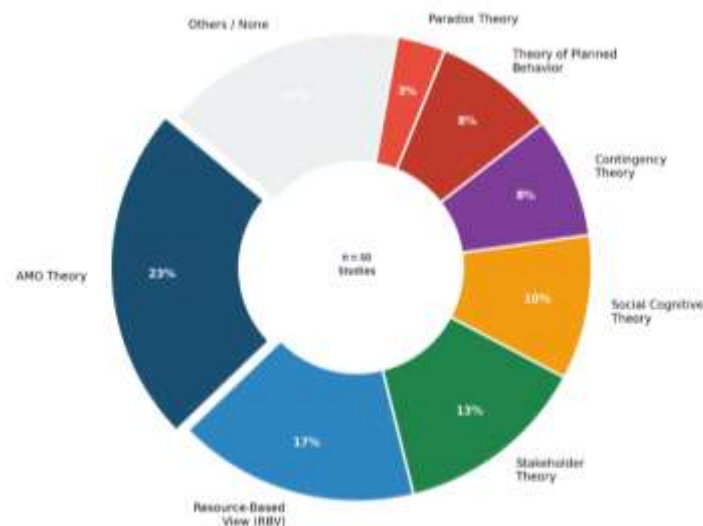


Figure 3. Theoretical Frameworks Applied in GHRM Research (n=50 studies; multiple frameworks may apply per study).

4.4 Keyword Co-occurrence and Thematic Clusters

Figure 4 visualizes the keyword co-occurrence network, revealing four primary thematic clusters that define the intellectual architecture of contemporary GHRM research. Cluster 1 centers on employee green behavior outcomes; Cluster 2 captures organizational performance and green innovation outcomes; Cluster 3 reflects leadership and AMO mechanisms; and Cluster 4 encompasses specific GHRM practice domains. An emerging cluster signals the field's expanding frontier at the intersection of sustainability and digital transformation.

Figure 4. Keyword Co-occurrence and Thematic Cluster Map of GHRM Research



Figure 4. Keyword Co-occurrence and Thematic Cluster Map of GHRM Research. Node size reflects keyword frequency; edge thickness reflects co-occurrence strength.

4.5 Research Methodology Distribution

Figure 6 presents the methodological distribution across the corpus. Quantitative approaches—particularly PLS-SEM (n=24) and CB-SEM/AMOS (n=8)—dominate GHRM research, consistent with the field's emphasis on testing structural relationships between latent variables. Regression-based approaches (n=5) represent a smaller

but significant strand. Qualitative studies constitute fewer than 10% of the corpus, while bibliometric analyses and mixed-method studies are emergent but underrepresented. This methodological imbalance represents a significant limitation and a priority for future research diversification.

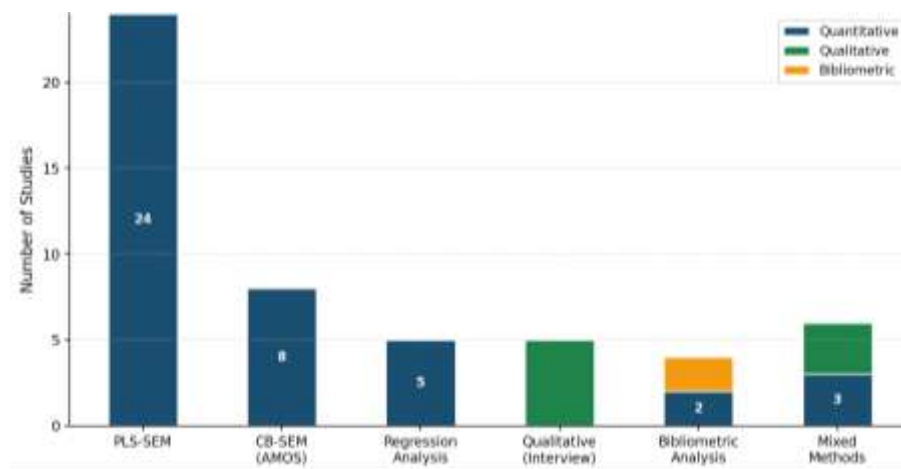


Figure 6. Research Methodologies Employed in GHRM Studies (n=50).

4.6 Citation Analysis – Most Influential Works

Figure 7 presents the top-cited articles in the corpus. [10] leads with 400 citations, establishing sustainability reporting as a foundational reference. [1] ranks second with 237 citations, demonstrating the impact of employee engagement research on GHRM scholarship. [32] and [18], both from the landmark IJHRM special issue, reflect the enduring influence of the 2016 foundational contributions. Among more recent works, [27] with 69 citations reflects the growing importance of technology-GHRM intersections.

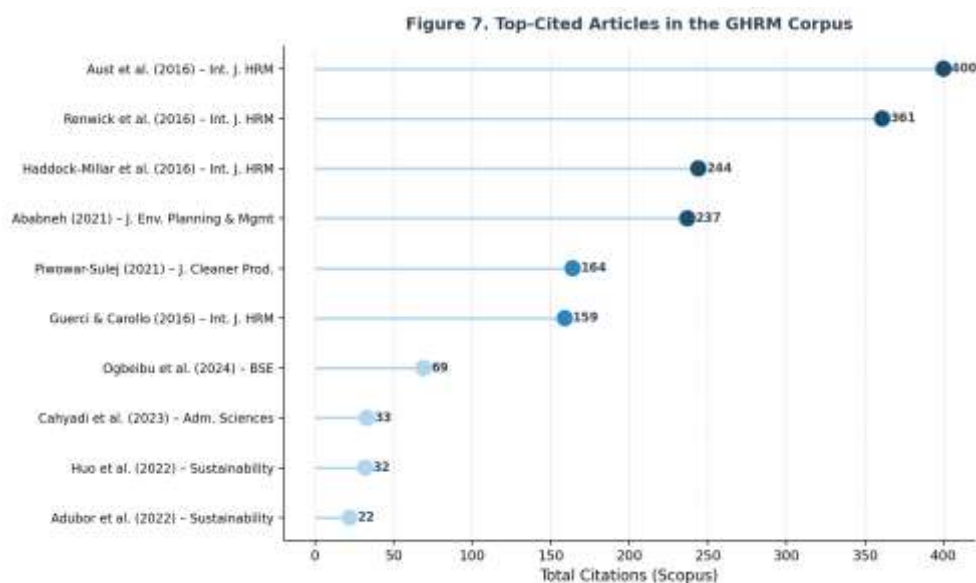


Figure 7. Top-Cited Articles in the GHRM Corpus. Citation counts as of September 2025 (Scopus).

4.7 Bibliometric Summary Statistics

Table 1 presents a consolidated summary of key bibliometric indicators derived from the corpus.

Table 1. Bibliometric Summary Statistics of the GHRM Research Corpus

Bibliometric Indicator	Value / Finding	Implication
Total articles analyzed	50 peer-reviewed articles	Comprehensive corpus from Scopus (2016–2025)
Publication period	2016–2025	Decade-long trajectory of GHRM research
Peak publication year	2024 (n=9)	Sustained acceleration post-pandemic

Growth rate (2016–2024)	+125% increase	Field expanding rapidly in recent years
Most prolific journal	Sustainability (MDPI)	Open-access outlets dominating recent output
Top foundational journal	Int. J. Human Resource Management	Discipline-defining publications clustered in 2016
Most cited article	[10] – 400 citations	Sustainability reporting as cornerstone reference
Most cited recent article	[1] – 237 citations	Employee engagement–green behavior link most impactful
Dominant research region	South Asia & Middle East (43%)	Developing economy focus predominates
Dominant methodology	PLS-SEM (48% of studies)	Quantitative approaches dominate
Most applied theory	AMO Theory (28% of studies)	AMO widely adopted as GHRM framework
Dominant outcome variable	Environmental/Org. performance	Performance outcomes central to GHRM discourse
Key mediating variable	Employee green behavior	Individual behavior as primary transmission mechanism
Key moderating variable	Green transformational leadership	Leadership amplifies GHRM effectiveness across contexts

5. Thematic Synthesis: Summary of Included Studies

Table 2 provides a summary of selected included studies, capturing key characteristics across theoretical frameworks, methodologies, GHRM practices examined, and principal findings.

Table 2. Summary of Selected Included Studies (n=10 of 50)

Author(s) & Year	Country/Sector	Theory	Method	GHRM Practices	Key Finding
[2]	Egypt / Hotels	AMO Theory	Qualitative (Semi-structured Interview)	Training, Communication, Trust	Managerial competencies (problem-solving, communication, trust) central to employee green behavior
[4]	Saudi Arabia / Private Sector	Theory of Planned Behavior	SEM (Mplus), n=250	Training, Performance Mgmt, Involvement	Green creativity mediates GHRM → sustainable development
[26]	Jordan / Manufacturing	Contingency Theory	PLS-SEM, n=180	Green policy alignment, Green adaptability	GHRM fully mediates SMAPs → environmental performance
[13]	India & UAE / Multi-sector	None specified	SPSS/AMOS, n=246	E-HRM, Green rewards, Green motivation	E-HRM facilitates GHRM and environmental sustainability
[21]	Pakistan / Manufacturing SMEs	RBV	PLS-SEM, n=329	Green intellectual capital, GHRM	Green innovation mediates GHRM → env. performance; GTL moderates
[16]	Malaysia / Universities	Social Learning Theory	PLS-SEM, n=460	Green training, Green recruitment	GHRM → green self-efficacy → ecological behavior
[27]	Nigeria / Manufacturing	Dynamic Capabilities	Lagged survey, n=461	Green training, Green recruitment, Green compensation	STARA capability moderates GHRM–sustainability link
[22]	South Africa / Multi-sector	Social Cognitive Theory	SEM, n=610	Green organizational commitment, Green innovation	Both mediate GHRM → low-carbon behavior; GTL moderates
[1]	Jordan / Hotels	Person-Org Fit Theory	Quantitative, n=376	Green recruitment, Training, Performance	Employee engagement mediates GHRM → green behavior

[32]	UK/International / Review	AMO Theory	Literature Review	All GHRM domains	Introduced multi-level GHRM framework; foundational reference
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5.1 Theme 1: GHRM Practices and Employee Green Behavior

The most extensively researched area in GHRM scholarship concerns the relationship between specific GHRM practices and various dimensions of employee green behavior. The literature consistently demonstrates that GHRM practices positively influence employee ecological behaviors, green behavioral intentions, pro-environmental behavior, and low-carbon behaviors [1, 16, 22]. Employee engagement with environmental initiatives emerges as a critical mediating mechanism. Ababneh [1] demonstrated that employee engagement partially mediates the GHRM–individual green behavior relationship among hotel employees in Jordan, while also emphasizing the moderating role of personality attributes. Green self-efficacy—employees' belief in their capability to perform environmentally responsible actions—has been identified as a significant mediator in multiple studies [16, 12]. Green transformational leadership functions both as a mediator and moderator, with leaders who embody green values amplifying the effectiveness of GHRM practices in shaping follower behavior [22].

5.2 Theme 2: GHRM and Organizational Environmental Performance

The second major thematic cluster addresses GHRM's effects on organizational-level environmental performance and sustainability. In manufacturing and industrial contexts, GHRM practices have been shown to enhance environmental performance both directly and indirectly through green innovation [21, 8]. Munther [26], in a study of 180 professionals across 53 Jordanian manufacturing firms, found that GHRM fully mediates the relationship between Strategic Management Accounting Practices and environmental performance—demonstrating that technical accounting instruments require complementary GHRM mechanisms to produce ecological outcomes. Smart technology integration has emerged as a novel antecedent of GHRM effectiveness [27], with STARA capability positively predicting both GHRM programs and environmental sustainability across Nigerian manufacturing organizations.

5.3 Theme 3: Mediating and Moderating Mechanisms

A defining characteristic of contemporary GHRM research is its attention to process mechanisms. At the individual level, green creativity mediates the GHRM–sustainable development relationship [4], extending the Theory of Planned Behavior by positioning green creativity as a key behavioral mechanism. Green organizational commitment and green innovation practices jointly mediate the GHRM–low-carbon behavior relationship [22]. At the organizational level, organizational reputation and firm attractiveness have been identified as GHRM outcomes moderated by leadership style [25]. E-HRM integration serves as a facilitating mechanism, particularly when supported by green rewards and motivation systems [13]. Shared and inclusive governance structures positively predict environmental commitment, with employee participation mediating these relationships in higher education contexts [14].

5.4 Theme 4: Sector-Specific and Contextual Applications

GHRM research has increasingly examined sector-specific applications. The hospitality and tourism sector has attracted considerable attention, with studies examining GHRM in Egyptian hotels [2], Jordanian hotels [6, 1], and Pakistani hotel firms [8]. Manufacturing sector research has emphasized GHRM in SME contexts across Pakistan, Nigeria, and South Africa [20, 3]. The education sector has emerged as a growing area, with university-context studies from the United States, Pakistan, and Ghana [14, 34]. Personal norms, gender, and religious or cultural values have been found to moderate GHRM–sustainability relationships in developing economy contexts [34, 4, 26].

6. Discussion

6.1 Theoretical Contributions

This review makes several theoretical contributions. First, by mapping the intellectual architecture of the field, the study confirms the theoretical pluralism that characterizes GHRM research, with AMO, RBV, stakeholder theory, and paradox theory [17] each illuminating distinct aspects of GHRM effectiveness. Second, the review reveals the critical role of mediating mechanisms in explaining GHRM outcomes—indirect effects through green creativity, organizational commitment, and green innovation are more robust than direct effects. Third, the review highlights an emerging but undertheorized intersection between GHRM and digital transformation, with E-HRM,

AI, and STARA integration representing a qualitatively new configuration that existing theoretical frameworks do not fully capture [13, 27].

6.2 Practical Implications

The evidence consistently supports the strategic value of integrated GHRM systems. Organizations should pursue comprehensive GHRM design rather than piecemeal adoption of green practices, as the synergistic effects of combined green recruitment, training, performance management, and compensation are greater than those of individual practices. The central role of green transformational leadership underscores the importance of leadership development as a precondition for GHRM effectiveness [4]. The competency framework centering problem-solving, communication, and trust developed by [2] offers a practical roadmap for managerial development programs. Evidence on green employee empowerment highlights the importance of moving beyond top-down GHRM to create genuine structural opportunities for employee voice and co-creation of sustainability initiatives [14].

6.3 Research Gaps and Future Directions

Table 3 synthesizes the critical research gaps identified through this review, organized by gap type, current limitation, future research direction, and priority level.

Table 3. Research Gaps and Future Directions in GHRM Scholarship

Research Gap	Current Limitation	Future Research Direction	Priority Level
Longitudinal designs	Cross-sectional studies dominate (85%); causality cannot be established	Multi-wave longitudinal and natural experiments to trace GHRM impacts over time	Critical
Geographic diversity	Pakistan, Saudi Arabia & Jordan account for >40% of studies	Studies needed in Latin America, francophone Africa, Central/Eastern Europe	High
Digital GHRM	AI/E-HRM/STARA integration undertheorized	Examine algorithmic GHRM, digital green nudging, and HR-AI sustainability interfaces	Critical
Qualitative depth	Fewer than 10% of studies use qualitative methods	Ethnographic and case-study approaches to examine GHRM implementation dynamics	Moderate
Cross-sectoral comparison	Most studies single-sector; hospitality and manufacturing over-represented	Comparative multi-sector studies across public, private, and NGO contexts	High
Multi-level analysis	Individual-level analyses predominate; macro-level HR systems neglected	HLM and multi-level SEM to examine individual–team–org interactions in GHRM	High
Cultural moderators	Cultural dimensions rarely specified; implicit universalism in many studies	Explicit cross-national comparisons using Hofstede/GLOBE cultural dimensions	Moderate
Financial outcomes	Environmental performance dominates; financial/HR performance metrics sparse	Integrate triple-bottom-line metrics; examine GHRM ROI and cost-benefit evidence	Moderate

5. Conclusion

This bibliometric analysis and systematic literature review of 50 Scopus-indexed GHRM publications (2016–2025) provides a comprehensive mapping of the intellectual landscape of GHRM scholarship. Four dominant thematic clusters define contemporary research: the relationship between GHRM practices and employee green behavior; GHRM's organizational-level environmental performance effects; the mediating and moderating mechanisms conditioning GHRM effectiveness; and sector-specific and contextual GHRM applications. The AMO framework dominates theoretical discourse, PLS-SEM dominates methodologically, and developing economies—particularly in South Asia and the Middle East—dominate geographically. The field faces significant challenges: the dominance of cross-sectional designs limits causal inference; geographic concentration restricts generalizability; and the digital transformation of HRM creates new GHRM configurations that theoretical frameworks have yet to fully address. Addressing these gaps requires sustained investment in longitudinal, cross-cultural, mixed-method, and digitally oriented GHRM research. As global environmental imperatives intensify,

the insights generated by GHRM scholarship become ever more critical for informing organizational practice and public policy in the pursuit of a sustainable future.

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