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GREEN HRM IN ASIA: A SYSTEMATIC REVIEW OF TRENDS, GAPS, AND METHODOLOGICAL INSIGHTS

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Abstract:

Green Human Resource Management (GHRM) has recently become a key strategy for embedding sustainability within organizational routines, promoting employee pro-environmental behavior, and improving corporate environmental performance. Although GHRM has been the centre of attention, little is known regarding the role of leadership styles, organizational strategies and contextual factors in determining the effectiveness of GHRM across sectors and geographical location. In this study, we show that GHRM practices are critical for organizational sustainability as they promote green performance and corporate environmental strategies while engaging employees in sustainability. Our findings show that, especially transformational and environmentally specific leadership, is integral to the development of pro-environmental behaviors. Moreover, GHRM practices lead to sustainability performance through the mediating role of organizational ambidexterity, green training, and psychological climate. These findings highlight the significance of incorporating GHRM into broader corporate sustainability initiatives to realize sustainable environmental and economic advantages. Future research will yield more robust results and more profound conclusions on the long-term effects of GHRM if methodological issues like cross-sectional research designs and self-reported biases (e.g., using the same people to measure both the independent and dependent variable) are considered. AI and big data analytics represent promising frontiers for optimizing GHRM practices.

Keywords:

Asia; Behavior; Green HRM; Leadership; Methods; Sustainability;

Introduction

There has been a rapid increase in efforts toward environmental protection and greener production strategies. In response to significant environmental challenges such as climate change, pollution, excessive use of natural resources, and deforestation, companies are increasingly incorporating environmental sustainability into their business and competitive strategies (Molina-Azorín et al., 2021). In the age of commercial globalization, organizations must prioritize both efficiency and revenue generation while simultaneously ensuring long-term sustainability. Companies and governments across the globe are adopting sustainable practices not only to comply with growing environmental expectations but also to enhance their competitiveness (Yong et al., 2019a). These approaches promote environmental responsibility, align business operations with eco-friendly practices, and enhance organizational reputation.

Consequently, organizations are under increasing pressure to implement sustainability initiatives, especially those targeting the environmental impacts of their internal operations (Baah et al., 2021). To address these pressures, organizations have turned to Human Resource Management (HRM) as a strategic mechanism for embedding sustainability into workforce management and broader corporate policies. As a result, Green Human Resource Management (Green HRM) has emerged as a critical approach for aligning organizational practices with environmental sustainability objectives (Ren et al., 2018). Figure 1 shows the pathway towards sustainable performance related to Green HRM.

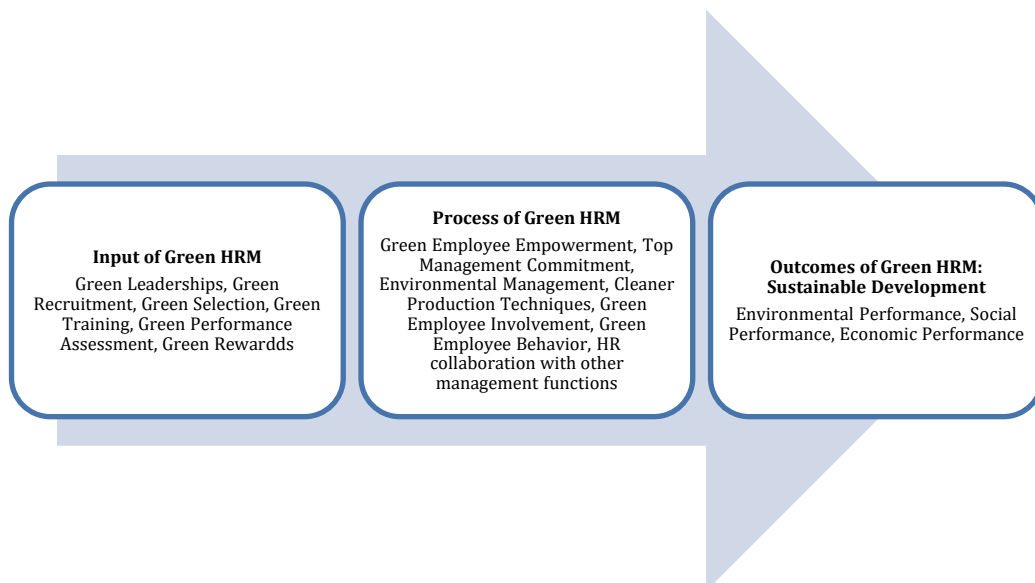


Figure 1: Pathway Towards Sustainable Performance Adapted From (Muhammad & Syaharizatul, 2021)

Green HRM has gained significant attention over the past decade, as organizations have recognized its potential to reduce environmental footprints and enhance sustainability performance. Research on Green HRM has expanded considerably since 2016 (Anwar et al., 2020; Farrukh et al., 2022; Molina-Azorín et al., 2021; Nisar et al., 2021; Ren et al., 2018; Yong et al., 2019b). This surge in scholarly interest corresponds with heightened awareness of global environmental issues, which has prompted HR departments to implement eco-friendly policies such as paperless systems, carbon footprint reduction, and waste management initiatives (Chandana et al., 2024; Das & Dash, 2023; Mishra, 2017). HR professionals play a vital role in promoting sustainability by communicating environmentally conscious practices,

raising employee awareness, and enhancing operational efficiency (Cheema & Javed, 2017; Saeed et al., 2019). Thus, Green HRM serves as a strategic and continuous transformation toward more sustainable organizational operations.

As Asia experiences economic and policy-driven shifts toward sustainability, the role of HRM in guiding organizations through this transition has become increasingly important (Ren et al., 2018). The APEC agreement on tariff reductions for green technologies (APEC, 2016) exemplifies the region's growing commitment to environmentally sustainable economic policies. It also underscores the emerging significance of integrating environmental management (EM) into corporate strategies. These changes present both opportunities and challenges for businesses seeking to realign their operations with sustainability objectives.

In this rapidly evolving business environment, Green HRM is garnering attention for its potential to integrate environmental responsibility across HR functions and support sustainable business practices. Similar to countries such as Indonesia, South Korea, and Thailand—which enhanced their governance frameworks following the 1997 Asian Financial Crisis (Chung, 2021; Lu & Batten, 2023)—companies in the region are now adopting green policies to meet regulatory demands and stakeholder expectations. Moreover, with Asian consumers increasingly favoring environmentally responsible companies (Chaihanchai & Anantachart, 2023; Nguyen-Viet, 2023), there is a growing imperative for organizations to implement Green HRM strategies that foster employee engagement and nurture a culture of environmental responsibility.

While substantial research on Green HRM has emerged in Western contexts, studies focusing specifically on Asia remain limited. Given the region's unique regulatory environments, economic structures, and cultural values, it is crucial to explore how Green HRM has been implemented and adapted in various Asian contexts. Understanding this will offer valuable insights for progressive organizations and industries striving to embed sustainable business practices in the region.

Furthermore, Asian countries vary significantly in their economic priorities, regulatory mechanisms, and cultural perspectives on sustainability. These contextual differences have important implications for how effectively Green HRM practices can be implemented. This review aims to systematically examine the literature on Green HRM in Asia, highlighting overarching themes, methodological trends, and existing research gaps. Through a systematic selection and analysis of relevant studies, the review seeks to identify Asia-specific themes, strategies, and policy recommendations for Green HRM implementation. While prior reviews have often generalized Green HRM practices across regions, this study offers a region-specific lens by considering factors such as government sustainability initiatives, cultural attitudes toward green practices, and industry-specific adoption patterns in Asia. This comparative perspective contributes valuable insights for policymakers, corporate leaders, and HR professionals seeking to design effective and culturally appropriate sustainability strategies within their organizations.

Therefore, this review seeks to answer the following research questions:

1. What are the dominant themes and research trends in Green HRM literature within the Asian context?
2. Based on existing literature, what are the key research gaps and future directions for Green HRM in Asia?

3. What methodological approaches have been used in Green HRM studies in Asia, and what are their limitations?

A systematic literature review methodology is employed to analyze, synthesize, and interpret existing academic contributions on Green HRM in Asia between 2015 and 2024. This review seeks to investigate and categorize the current body of knowledge while identifying key thematic areas and future research opportunities. Accordingly, the review's objectives are:

1. To identify and analyze dominant themes and emerging trends in Green HRM literature within the Asian context, including key focus areas and theoretical perspectives.
2. To highlight critical research gaps and propose future directions for advancing Green HRM in Asia, with attention to underexplored issues and emerging developments.
3. To examine the methodological approaches adopted in Green HRM studies in Asia, assessing their strengths, weaknesses, and implications for research quality and practical relevance.

Methodology

This study employs a systematic literature review (SLR) to identify related literature and assess and synthesize it to ensure comprehensiveness. According to Williams et al. (2021), a systematic review focuses on a particular question, uses specific and explicit procedures to conduct a comprehensive literature survey and critical assessment of each research, and infers what we presently know and unknown about a specific topic or issue. Four phases were undertaken using stated criteria to carefully filter and select all potential papers based on a well-established methodological framework. The four critical criteria that define a systematic review are: (1) a defined objective, (2) a systematic approach to locate all related research, (3) an analysis of articles discovered, and (4) synthesizing a knowledge base (Bueno et al., 2021). Therefore, this study employs Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PRISMA aims to enhance the quality of systematic reviews by assisting authors in defining some guidelines before completing the review (Liberati et al., 2009). The PRISMA framework includes literature identification, inclusion/exclusion, eligibility and quality assessment.

Search Strategy

For the systematic literature review, the initial stage was to determine the keywords as search queries to build the research starting point and the scope of the study. The literature was reviewed using the Web of Science (WoS) database. WoS is an established database that is widely used and encompasses publications from reputable journals. The search keywords are "*green AND human AND resource AND management AND Asia*".

Screening and Eligibility Process (Selection Criteria)

The search only focuses on mapping existing literature on Green HRM in the last decade, from 2015 to 2024. This study focuses on the last decade to study how studies on Green HRM have evolved. Therefore, 180 articles were initially found in the database using the selected keywords. There are no duplicates since a database was used, and no records were marked ineligible. Therefore, a total record of 180 were screened using the inclusion and exclusion criteria shown in Table 1.

Table 1: Inclusion And Exclusion Criteria.

Inclusion	Exclusion
Papers that are written in English	Papers that are written in other languages
Publications in scientific journals	Non-scientific journals
Research article of journal publication	Conference paper, book chapter, review, conference review, editorial book, note, erratum, letter, short survey
Publications from 2015 to 2024	Publications before 2015 or after 2024
The subject area on management, business, industrial relations labor, economics, environmental studies, social science interdisciplinary, green sustainable science technology, environmental studies	Other subject areas such as geosciences, engineering, water resources,
Publications related to Green HRM	Publications not related to Green HRM
Publications in the final stage	Article in press

After screening, in the year range of 2015 to 2024, 160 studies were found. However, since this review focuses mainly on research articles, all other publications besides research articles were removed and an article written in other language besides English was excluded. Therefore, a total of 114 studies were left for the eligibility assessment. Some studies, such as those outside Asia, were excluded during the eligibility assessment, leaving the number of publications to 47. Moreover, 32 studies were excluded because they were not related to the subject area and unrelated to the scope of this review, as stated in Table 1. Ultimately, 15 studies that focus on the themes of this study were synthesized in this study. Figure 1 shows the PRISMA framework adopted in this study.

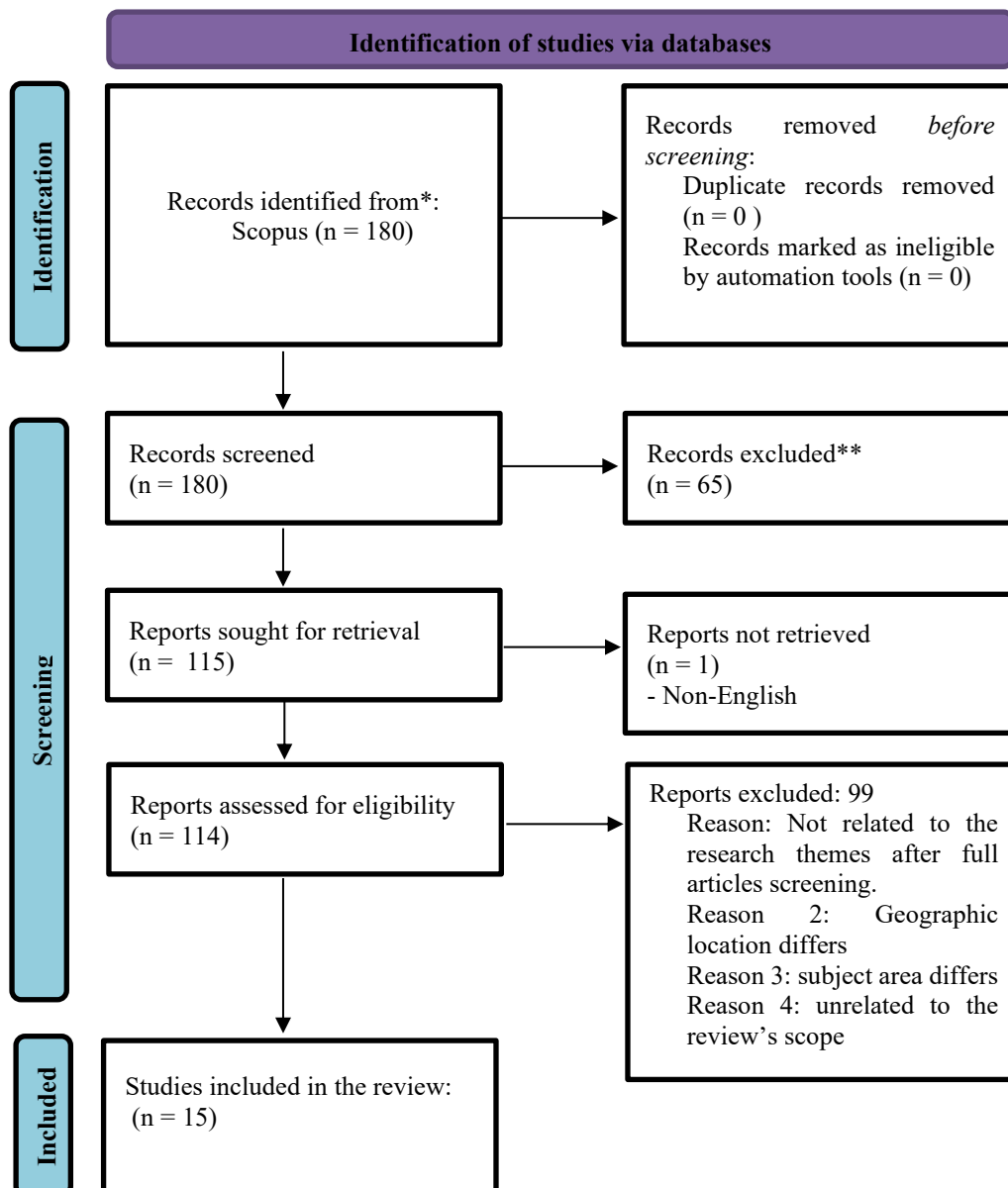


Figure 1: PRISMA Framework For Green HRM Literature Review In Asia

Result and Discussion

A Scoping Review of Green HRM in Asia: Dominant Themes and Emerging Research Directions

Green Human Resource Management (Green HRM) is a critical research domain nowadays, particularly within the Asian setting, as the contributions of businesses to sustainable development goals (SDGs) and corporate environmental accountability are increasing. The visualization shown in Figure 1 illustrates significant topics and trends in Green HRM research, demonstrating that this discipline is swiftly expanding in both theoretical and practical domains. This section examines prevailing themes, ideas, and methodological trends, along with any gaps in the literature, in alignment with the study's focus.

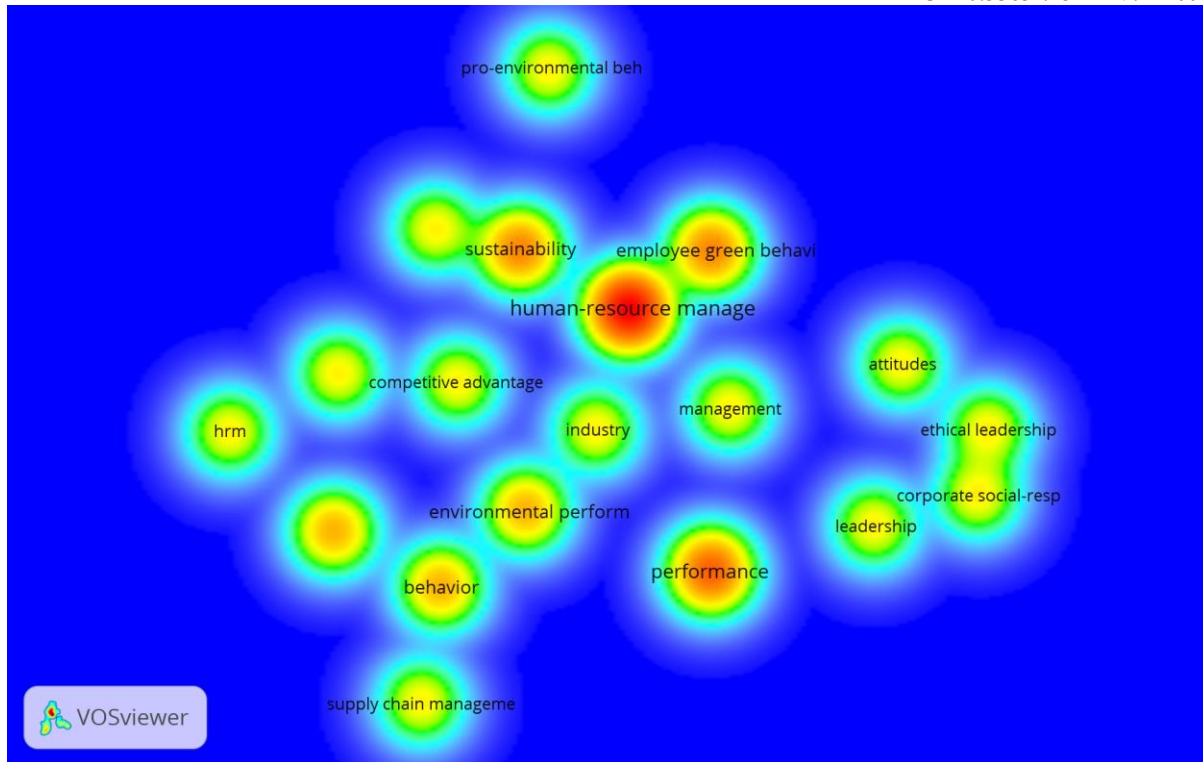


Figure 1: Visualization of Key Themes and Research Trends in Green HRM Literature

The heatmap generated by VOSviewer delineates the principal themes, prominent subjects, or research trends in Green HRM. The primary focus on "human resource management" underscores its significance in the literature, with closely related subjects such as sustainability, employee green behaviour, performance, and ethical leadership representing key study concerns.

The most predominant theme arising from the literature is "human resource management", which is at the centre of the heatmap. This implies that Green HRM is generally considered a type of HRM practice based on sustainable development principles. Closely associated with the main theme of human resource management are "sustainability" and "employee green behaviour", which suggest a concerted research effort focused on the impact of pro-environmental behaviours in the workplace and how HR policies and practices impact this. Green HRM has been recognized as an integral factor leading to a culture of environmentalism among employees. Previous studies (Paulet et al., 2021; Ren et al., 2018) have investigated Green HRM to employee behaviour, highlighting Green HRM as an enabler of an environmentally responsible corporate culture.

The other significant research trend is related to "performance"; this is about specifically "environmental performance" as well as "competitive advantage". This shows that numerous articles are toward the measurement of how Green HRM impacts organizational as well as environmental effects. It has been empirically found that companies that adopt Green HRM practices tend to improve their firms' environmental compliance, operational efficiency, and long-term financial performance (Pham et al., 2019; Shah et al., 2024).

One important thematic area of the Green HRM literature in Asia is its intersection with behavioral and psychological processes. This may indicate an emerging interest in the cognitive and emotional antecedent of pro-environmental behavior, as indicated by the keywords

behavior, attitudes, and pro-environmental behavior. Research in environmental psychology (Graves et al., 2019) suggests that employees' engagement in sustainable workplace practices is strongly affected by their intrinsic motivation, values, and attitudes.

Furthermore, "ethical leadership," "corporate social responsibility" (CSR), and "leadership" emerge as essential subjects. Research indicates that leadership styles and ethical considerations significantly affect Green HRM practices (Alherimi et al., 2024; Ojo, 2022). Research by Kim et al. (2017) highlights the ethical similarities and the oversight of transitions towards sustainability-oriented organizations, bolstering Green HRM practices. This aligns with stakeholder theory, which posits that corporations have environmental and social responsibilities alongside profit maximization.

The use of keywords like "industry" and "supply chain management" suggests that Green HRM in Asia encompasses not just human resource management and its associated fields but has also extended to include operational and industrial applications. This illustrates the increasing interest in integrating Green HRM with sustainable supply chain management to maintain environmentally sustainable practices across all enterprises (Jabbour & de Sousa Jabbour, 2016).

Qualitative, quantitative, and mixed-method approaches have been used in studies on Green HRM in Asia. The terms "management" and "HRM" in the visualization suggest that most papers are normative/ conceptual, like case-based papers. Although these methodologies have provided valuable insights, they also have limitations, including generalizability issues and lack of longitudinal data. Future studies need more solid methodologies, namely longitudinal studies and experimental designs, to establish causal relationships between Green HRM practices and organizational outcomes.

Review of Previous Studies: Methodologies, Strengths, Weaknesses, and Future Research Directions

Table 2 highlights the previous studies on green HRM while focusing on the methods used, the findings and limitations for future directions. The current body of knowledge on Green Human Resource Management (GHRM) and sustainable human resource practices reflects a diversity of methodological approaches, advantages, and weaknesses. They provide valuable insights into the way organizations use HRM strategies to ensure green performance and sustainability at work. Nevertheless, this body of evidence is methodologically limited, which has implications for the generalizability and relevance of their results.

This literature review demonstrates the wide range of findings that stress the vital importance of GHRM for creating sustainable organizational practices and improving employee pro-environmental behaviors. In different geographical and industrial contexts, these studies indicate that GHRM practices, leadership styles and institutional pressures play a crucial role in enhancing environmental performance and sustainable development.

Table 2: Previous Studies on Green HRM in Asia

S/N	Focus	Country	Methodology	Findings	Limitation	References
1	It explores multiple equifinal paths that firms can take to achieve a favorable green image and examines the impact of these paths on firm performance	China	<ul style="list-style-type: none"> To address common method bias, the study used two-round surveys with multiple respondents, Harman's one-factor test, and confirmatory factor analysis (CFA) The research ensured reliability and validity through high Cronbach's alpha values and composite reliability scores, indicating a robust measurement structure The study combined fuzzy-set Qualitative Comparative Analysis (fsQCA) and Propensity Score Matching (PSM) to explore multiple paths to achieving a favorable green image and their impact on firm performance 	<ul style="list-style-type: none"> Perceived institutional pressures, both business and social, play a crucial role in determining the GHRM practices that firms adopt to enhance their green image The configurations of GHRM practices and institutional pressures are robust, even when the frequency and consistency thresholds are adjusted The study confirms the reliability and validity of its measurement structure, with high Cronbach's alpha and composite reliability scores 	<ul style="list-style-type: none"> The study is limited to Chinese manufacturing firms, which may not fully represent other sectors or geographical regions. This limits the generalizability of the findings to other contexts. The research relies on cross-sectional data, which may not capture the dynamic nature of GHRM practices and institutional pressures over time. Despite efforts to address common method bias, there may still be some biases inherent in self-reported data, which could affect the accuracy of the findings. 	(Zhang et al., 2024)
2	It focuses on the development of green supply chain management through the digital educational	Uzbekistan	<ul style="list-style-type: none"> The research is applied and descriptive-survey in nature, focusing on the strategic management of human resources and its impact 	<ul style="list-style-type: none"> Human resource management, digital purchasing, digital marketing, digital strategy, digital training, and the environment 	<ul style="list-style-type: none"> The study's sample is limited to senior, middle, and operational managers from food industry and biotechnology 	(Zokirov et al., 2024)

	management of human resources		<p>on the digital supply chain's efficiency</p> <ul style="list-style-type: none"> The study's statistical population included senior, middle, and operational managers from food industry and biotechnology companies in Central Asia, totaling 622 individuals in 2023 The research utilized a researcher-made questionnaire on human resource management and digital supply chain, designed in a Likert scale format. 	<p>significantly enhance the efficiency of the digital supply chain</p> <ul style="list-style-type: none"> Human resource management and the internal environment are the most influential factors in improving digital supply chain efficiency 	<p>companies in Central Asia, which may not represent other industries or regions</p> <ul style="list-style-type: none"> The study's findings are based on self-reported data, which can be subject to biases and inaccuracies 	
3	The research focuses on the relationship between Green Human Resource Management (GHRM) and sustainable development performance, using the dual model of organizational ambidexterity to explain this relationship	China	<ul style="list-style-type: none"> 452 valid responses were obtained by the end of the study The study employed a Likert 5-point scale for measurement, ensuring high reliability and validity through translation-back translation procedures and expert optimization Confirmatory factor analysis (CFA) was conducted using AMOS 24 to test the research models and variables, 	<ul style="list-style-type: none"> The study found that Green Human Resource Management (GHRM) positively impacts sustainable development performance through organizational ambidexterity, which balances exploration and exploitation activities within organizations The study expanded the understanding of GHRM's impact by considering responsible leadership as a boundary 	<ul style="list-style-type: none"> The study acknowledges limitations such as the use of only questionnaire surveys and the cultural specificity of the sample, suggesting future research could incorporate experiments and cross-cultural comparisons Although efforts were made to minimize common method bias, such as using multi-wave data collection and 	(Zhao, Wang, et al., 2024)

			ensuring discriminant validity among variables	condition, indicating that leadership plays a crucial role in enhancing sustainable development performance	statistical tests, it could not be entirely eliminated	
4	The study focuses on constructing a hierarchical sustainable human resource management (SHRM) model, emphasizing the interrelationships among its attributes using qualitative information	Indonesia	<ul style="list-style-type: none"> It combines fuzzy set theory with the Delphi method to enhance questionnaire quality and overcome expert reference constraints. Fuzzy Decision-Making Trial and Evaluation Laboratory (DEMATEL) was applied to visualize causal interrelationships among SHRM attributes 	<ul style="list-style-type: none"> Green Performance Management and Compensation are identified as leading factors contributing to human resource benefits and economic sustainability within the SHRM mode The study highlights open environmental communication, green human resource planning, green training and development, employee eco-friendly behavior, and organizational culture as the top five criteria for practical improvement in the healthcare industry 	<ul style="list-style-type: none"> The methodology used, including the fuzzy Delphi method and fuzzy DEMATEL, may have inherent limitations that could affect the results, such as reliance on expert judgment and the complexity of handling fuzzy data The study acknowledges that the attributes proposed for enhancing the SHRM model need further exploration and extension, indicating that the current model may not fully capture all relevant factors 	(Parng et al., 2021)
5	The research focuses on how green human resource practices and green strategies positively influence a firm's green performance.	Pakistan	<ul style="list-style-type: none"> The study employed a cross-sectional research design and collected data through questionnaires using a simple random sampling technique 	<ul style="list-style-type: none"> Green human resource practices and green strategies positively influence green performance in organizations 	<ul style="list-style-type: none"> The study used subjective instruments to measure green performance, which may lead to discrepancies compared to objective measures 	(Mansoor et al., 2022)

			<ul style="list-style-type: none"> • A two-wave data collection process was used to mitigate common method variance (CMV) bias, with each questionnaire coded to match responses from two different time points • Statistical measures, such as the Huber-White sandwich estimator, were used to control for organizational effects, and variance inflation factors (VIFs) were checked to ensure no collinearity issues • The sample consisted of 272 responses from employees in research and development, production, and human resources departments, after eliminating incomplete questionnaires 	<ul style="list-style-type: none"> • Green servant leadership mediates the relationship between green management initiatives and green performance, enhancing the effectiveness of these initiatives • The study found significant positive relationships between green management initiatives and green servant leadership, as well as between green servant leadership and green performance • The research highlights the importance of aligning HR practices such as recruiting, training, and rewarding with the green agenda to improve environmental performance 	<ul style="list-style-type: none"> • Self-report data was utilized, potentially introducing common method variance (CMV) bias, despite being a widely accepted approach in research 	
6	The paper focuses on developing and conceptualizing the construct of Green-Harmonious Human Resource Practice (GH-HRP) and examining its	China	<ul style="list-style-type: none"> • The study collected data from supervisor-employee dyads in small and medium-sized firms in southeastern China across various industries. 	<ul style="list-style-type: none"> • GH-HRP was found to promote employee organizational citizenship behavior (OCB) through the mediating roles of duty orientation and meaning of work 	<ul style="list-style-type: none"> • The acknowledged research limitations such as potential CMV effects and suggested future studies could use more objective measures or 	(Zhao, Zhu, et al., 2024)

	impact on employee organizational citizenship behavior (OCB)		<ul style="list-style-type: none"> The research involved both qualitative and quantitative methods. Semi-structured interviews were conducted with managers and employees to develop the GH-HRP construct, followed by a survey to validate the scale The GH-HRP scale was refined through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to ensure reliability and validity Regression analyses were used to test the hypotheses, examining the mediating roles of duty orientation and meaning of work, and the moderating role of ethical leadership 	<ul style="list-style-type: none"> Ethical leadership was shown to enhance the positive effects of GH-HRP on duty orientation and meaning of work, thereby fostering greater employee engagement in OCB The study addressed common method variance (CMV) by using a three-wave design and multi-source approach, confirming that CMV was not a significant issue in the findings 	experimental research to establish causal inference	
7	The study focuses on exploring how green human resource management (GHRM) enhances employees' pro-environmental behavior.	Pakistan	<ul style="list-style-type: none"> The study employed quantitative research methods to explore the relationship between green human resource management and pro-environmental behavior 	<ul style="list-style-type: none"> The study found that corporate environmental strategy and green psychological climate mediate the relationship between green human resource management 	<ul style="list-style-type: none"> The data collection was restricted to a specific time period, which might not capture changes in environmental consciousness and green 	(Mateen et al., 2023)

			<ul style="list-style-type: none"> Data were collected using a structured questionnaire from 161 employees in the healthcare sector of Punjab, Pakistan A cross-sectional survey design was used, and the sample was selected using simple random sampling from a population of 260, resulting in a sample size of 155 The analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) 	<p>(GHRM) and employees' pro-environmental behavior</p> <ul style="list-style-type: none"> It was observed that various HR practices have a more significant impact on corporate environmental strategy than others, suggesting that focusing on highly significant GHRM practices can enhance an environmentally-conscious workforce The study also highlighted the moderating effect of environmental consciousness, which plays a crucial role in enhancing pro-environmental behavior among employees 	<p>psychological climate over time</p> <ul style="list-style-type: none"> The study noted that healthcare sector employees exhibited exaggerated levels of environmental consciousness and green psychological climate during the pandemic, which could influence the results The study was geographically limited to the Punjab province of Pakistan due to mobility issues during the COVID-19 pandemic, which may affect the generalizability of the findings to other regions 	
8	It examines how firms can adopt high-road human resource (HR) practices to equip employees with the necessary green skills, given the inadequacies in the Thai education system to produce industry-ready workers	Thailand	<ul style="list-style-type: none"> The study employs a qualitative research methodology, focusing on a cross-case analysis of four firms across different industries in Thailand Data collection methods include semi-structured interviews, nonparticipant 	<ul style="list-style-type: none"> Firms across various industries in Thailand are responsible for equipping their employees with green skills due to the inadequacies of the Thai education and skill-formation system in producing industry-ready workers with green knowledge and abilities 	<ul style="list-style-type: none"> The research is based on qualitative studies, which may limit the generalizability of the findings to other countries or contexts Gaining access to firms across various industries and stakeholders was difficult due to resource and time constraints, as 	(Napathorn, 2021)

	with green knowledge and abilities		<p>observation, and reviews of archival documents and web-based resources to ensure data triangulation and overcome single-source bias</p> <ul style="list-style-type: none"> The study also involved field visits to vocational colleges, universities, and firms, as well as the analysis of field notes to develop an inductive analysis of green skills development 	<ul style="list-style-type: none"> The study highlights the importance of high-road HR practices, such as classroom training, on-the-job training, coaching, and mentoring, to develop green skills among employees 	<p>well as hesitance from firms in allowing data access</p> <ul style="list-style-type: none"> The study focuses specifically on the Thai education and skill-formation system, which may not reflect the situation in other developing countries 	
9	It examines how green transformational leaders empower employees to engage in eco-friendly practices, contributing to the organization's environmental management and performance''	India	<ul style="list-style-type: none"> The study conducted a survey among employees of IT firms across four major cities in India. Online questionnaires were distributed to 1,286 employees, with 293 responses deemed suitable for analysis A combination of convenience and snowball sampling was used The study employed structural equation modeling (SEM) to test the proposed 	<ul style="list-style-type: none"> The study found that green transformational leadership significantly promotes green empowerment among employees, encouraging them to engage in environmentally friendly practices It was observed that such leadership fosters organizational citizenship behaviors toward the environment (OCBE), enhancing employees' discretionary efforts in environmental management 	<ul style="list-style-type: none"> The study was limited to IT firms in four major cities in India, which may not represent other industries or regions. This could affect the generalizability of the findings to different contexts or sectors. The research employed a cross-sectional design, which limits the ability to infer causality between green transformational leadership and organizational 	(Priyadarshini et al., 2023)

			<p>hypotheses. This included confirmatory factor analysis (CFA) for measurement model testing and structural model testing for hypothesis validation</p> <ul style="list-style-type: none"> • Discriminant validity was confirmed using Fornell and Larcker's method, and composite reliability was established for all constructs • The study checked for common method variance using Herman's single factor test, ensuring that the data was not significantly affected by it 	<ul style="list-style-type: none"> • Environmental passion was identified as a crucial factor in promoting eco-initiative and eco-helping behaviors among employees when they are empowered for green practices 	<p>environmental citizenship behavior.</p> <ul style="list-style-type: none"> • The reliance on self-reported data from employees could introduce bias, as respondents might provide socially desirable answers rather than reflecting their true behaviors or attitudes. • Although the study checked for common method variance using Herman's single factor test, the potential for bias due to the use of a single data collection method remains a limitation 	
10	The paper focuses on how environmentally specific leadership can enhance green product development performance through the lens of the HRM system	China	<ul style="list-style-type: none"> • The study uses a three-wave survey method, collecting data from 362 top or middle managers in the new energy industry in China • Hierarchical linear regression and bootstrapping methods are employed to analyze the mediated moderation effect 	<ul style="list-style-type: none"> • The study confirms a positive effect of environmentally specific leadership on green product development performance • It identifies the strength of the HRM system as a significant mediator in the relationship between environmentally specific leadership and green 	<ul style="list-style-type: none"> • Data was collected from the same source, which could introduce common method variance, although efforts were made to control for this • The research examines the relationship between environmentally specific transformational leadership and green 	(Yan & Hu, 2021)

			<ul style="list-style-type: none"> Confirmatory factor analysis was conducted using MPLUS 7.4 to control for common method variance, adding an unmeasured latent method factor to the model The study ensured convergent and discriminant validity, with AVE higher than 0.50 and CR higher than 0.7 	<p>product development performance</p> <ul style="list-style-type: none"> The research also finds that green HRM significantly moderates the relationship between environmentally specific transformational leadership and the strength of the HRM system 	<p>product development performance primarily from the HRM system perspective, potentially overlooking other mechanisms like green knowledge management</p>	
11	The study focuses on understanding the mechanisms through which leaders' voluntary green behavior influences their subordinates' green behavior	China	<ul style="list-style-type: none"> The study analyzed data from 70 leaders and 190 employees to investigate the trickle-down effect of green behavior from leaders to subordinates It employed social learning theory to explain how leaders' green role model influence and employees' green self-efficacy mediate this relationship. 	<ul style="list-style-type: none"> The study confirmed that leaders' green behavior influences employees' green behavior through a trickle-down process. Leaders' green role model influence and employees' green self-efficacy were found to sequentially mediate this relationship Leader gender moderated the effects: the direct effect of leaders' green behavior on employees was stronger for male leaders, while the sequential mediating effect was stronger for female leaders. 	<ul style="list-style-type: none"> The study's sample size was relatively small, with only 70 leaders and 190 employees, which may limit the generalizability of the findings. The research focused on a specific cultural and organizational context, which might not be applicable to different settings or industries. The study primarily relied on self-reported data, which can introduce biases such as social desirability bias. The cross-sectional design of the study 	(Shao et al., 2023)

					limits the ability to infer causality between the variables examined	
12	It emphasizes the importance of leadership in promoting employees' environmental behavior, which is crucial for implementing sustainability initiatives effectively	India	<ul style="list-style-type: none"> The study employed a quantitative cross-sectional approach to investigate the relationships between Environment-Specific Servant Leadership (ESSL), Employee Green Value (EGV), and Green Organizational Citizenship Behaviour (GOCB) Data was collected from employees working in various hospitals in Ranchi, India, using a structured questionnaire distributed via email and facilitated by HR managers The measurement model was evaluated for reliability and validity, ensuring that all constructs had factor loadings above 0.70 and Cronbach's alpha values ranging from 0.824 to 0.939 	<ul style="list-style-type: none"> The study found that Environment-Specific Servant Leadership (ESSL) has a significant direct effect on Green Organizational Citizenship Behaviour (GOCB), indicating that leadership focused on environmental responsibility can directly enhance pro-environmental behaviors among employees Employee Green Value (EGV) was identified as a partial mediator in the relationship between ESSL and GOCB. This suggests that while ESSL directly influences GOCB, EGV also plays a complementary role in this relationship The relationships between ESSL and GOCB, ESSL and EGV, and EGV and GOCB were all found to be statistically significant, 	<ul style="list-style-type: none"> The cross-sectional design of the study does not allow for the determination of causal effects. A longitudinal study is recommended for future research to examine changes in outcome variables over time 	(Mandal & Pal, 2024)

			<ul style="list-style-type: none"> Convergent validity was confirmed with Average Variance Extracted (AVE) values surpassing the threshold of 0.5 	<ul style="list-style-type: none"> supporting the proposed hypotheses The R^2 values for GOCB and EGV were 0.847 and 0.435, respectively, indicating a good fit and strong predictive power of the model 		
13	This study explores the green human resource management practices that augment employee environmental performance within the health care sector amidst the COVID-19 pandemic.	China	<ul style="list-style-type: none"> The proposed model was tested using structural equation modelling-partial least squares (PLS-SEM) modelling based on respondents' data. 	<ul style="list-style-type: none"> The findings of this study support the direct relationship between GHRM practices and environmental performance and also through employees' green attitudes during the COVID-19 pandemic. The findings of the study further provide evidence that perceived personal inconvenience negatively moderates the relationship between GHRM practices and environmental performance. 	<ul style="list-style-type: none"> The result can not be generalized 	(Haq et al., 2022)
14	The research explores different pathways and configurations that lead to high levels of employee green behavior	China	<ul style="list-style-type: none"> The study employs fuzzy-set Qualitative Comparative Analysis (fsQCA) to explore the complex causal mechanisms and synergistic effects of multiple antecedent 	<ul style="list-style-type: none"> Multiple antecedents, including organizational identity and green self-efficacy, synergize to promote employee green behavior. These factors play crucial roles in 	<ul style="list-style-type: none"> The study acknowledges limitations in sample selection, as it focuses on China, which may affect the generalizability of the findings due to cultural and institutional 	(Yang et al., 2025)

			<p>conditions on employee green behavior</p> <ul style="list-style-type: none"> • Measurement model validation was conducted using factor analysis • The study collected data through online and on-site questionnaires 	<p>fostering such behavior across different pathways</p> <ul style="list-style-type: none"> • Organizational identity is a significant factor in promoting green behavior among employees, contributing to corporate sustainability and a positive corporate image 	<p>differences across countries</p> <ul style="list-style-type: none"> • The research relies on cross-sectional data collected through surveys, which may not capture changes over time or establish causal relationships 	
15	The study focuses on employee green behavior (EGB) and its measurement, highlighting the impact of employee actions on a company's environmental stance	India	<ul style="list-style-type: none"> • a survey method with purposive sampling • Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) • 	<ul style="list-style-type: none"> • The study successfully developed a 20-item scale to measure employee green behavior (EGB), addressing the lack of proper measurement tools in previous research • The confirmatory factor analysis (CFA) validated the factor structure of the scale, confirming its reliability and validity 	<ul style="list-style-type: none"> • Some subscales showed lower reliability values, although the composite reliability was within the accepted range • The study's sample was predominantly male, reflecting the gender distribution in the manufacturing industry, which may limit the generalizability of the findings • The limited variability of items in the scale could restrict its ability to capture diverse employee green behaviors 	(Roy & Sia, 2024)

A central finding among multiple studies is that Green HRM positively addresses organizational and employee outcomes across many studies. For instance, Zhang et al. (2024) found that the perceived institutional pressures, both business and social, had a substantial impact on GHRM practices and that these practices led to improved green image and performance. Similarly, Zhao et al. (2024) confirmed that GHRM positively influences sustainable development performance through organizational ambidexterity, which balances exploration and exploitation activities. This indicates that pursuing innovation for existing processes is a pathway for firms through which they can achieve sustainability. Furthermore, Mansoor et al. (2022) showed a direct relationship between green human resource practices and green performance, as well as green strategies and green performance, with green servant leadership mediating between them. Together, these findings highlight the need for human resource practices to align with environmental objectives to support better sustainability outcomes.

Leadership prevails as a key parameter for promoting green behaviors and sustainability applications. Priyadarshini et al. (2023) showed that green transformational leadership considerably enhances employees' green empowerment, which then leads to organizational citizenship behaviors toward the environment. In a similar vein, Yan and Hu (2021) reported that green product development performance is enhanced through environmentally specific leadership through behavioral and environmental strength of the HRM system. These studies, therefore, show that leaders who also enact and advocate environmental values can shape their subordinates to act in ways that are greener. Shao et al. (2023) investigate this concept by illustrating that employees' environmentally friendly behaviour is influenced by a trickle-down mechanism stemming from leaders' green behaviour, mediated by the leaders' role model effect and the employees' green self-efficacy. This, in turn, has a significant impact not just on green behaviours but also on an employee's convictions and confidence in pursuing environmental sustainability.

A significant theme identified in the literature is employee pro-environmental behaviours. Mateen et al. (2023) discovered that corporate environmental strategy and green psychological climate mediate the association between GHRM and employees' pro-environmental behaviour. This emphasizes the necessity of fostering an organizational atmosphere that promotes environmental quality. Furthermore, Zhao et al., (2024) introduce Green-Harmonious Human Resource Practice (GH-HRP) and demonstrate that GH-HRP favourably influences employee organizational citizenship behaviour (OCB) via duty orientation and the significance of work, a relationship that is enhanced by ethical leadership. Human Resource strategies that reinforce employees' sense of responsibility and the significance of their work can significantly enhance pro-environmental behaviours.

Our findings also highlight how contextual factors influence the efficacy of GHRM practices. For instance, the Thai education system fails to produce enough industry-ready workers with green skills, leading Napathorn (2021) to emphasize how firms should implement high-road HR practices to allow workers to develop and enhance the requisite knowledge and skill set required for green jobs. This highlights how national education and skill-formation systems can affect the adoption and effectiveness of GHRM practices. Similarly, Parng et al. (2021), in a study focused on the healthcare sector, rated green performance management and compensation among the highest contributors to human resource benefits and economic sustainability within the Sustainable Human Resource Management (SHRM) framework. This

demonstrates that industry-specific characteristics have a significant impact on GHRM practice formulation and operational reflection.

Albeit such valuable contributions, the observed literature reveals some limitations which are yet to be explored in future studies. Studies, including those by Zhang et al. (2024) and Napathorn (2021), are limited to specific locations, making them less generalizable. Moreover, studies like that of Priyadarshini et al. (2023) and Mandal and Pal (2024) prevent causal inference and indicate that longitudinal studies capturing dynamic change over time are needed. Studies like that of Mansoor et al. (2022) and Mateen et al. (2023) were constrained by potential biases, such as common method variance (CMV) and social desirability bias, which may lead to inaccuracies in the results. Subsequent studies should consider using more heterogeneous samples across workplace settings (i.e., industries) as well as geographical areas to improve the external generalizability of the results. Longitudinal analyses would allow for a better understanding of the causal pathways between GHRM practices and sustainability outcomes.

Additionally, future research should integrate objective measures of environmental performance (e.g., carbon footprint data) to supplement self-reported data, which is subject to biases. This is also essential to allow for the development of more well-rounded measurement scales, as initiated by Roy and Sia (2024), to capture the multifaceted nature of employee green behavior. The application of emerging technologies such as artificial intelligence and big data analytics in enhancing GHRM practices could lead to new avenues of research by providing innovative solutions to sustainability challenges. Addressing these gaps can allow future research to take a more all-encompassing approach when examining the impact of GHRM on sustainable development in organizations.

Theoretical Frameworks Underpinning Green HRM Research

Green Human Resource Management (GHRM) represents a strategic integration of environmental management into human resource practices, aiming to foster sustainable organizational development. The theoretical underpinnings of GHRM draw from various organizational and behavioral theories, providing a multifaceted framework for understanding its implementation and impact.

Institutional Theory

Institutional theory posits that organizations conform to external pressures and norms to gain legitimacy and stability. In the context of GHRM, organizations adopt green HR practices in response to regulatory requirements, societal expectations, and industry standards. These practices become institutionalized as organizations seek to align with environmental norms and enhance their legitimacy (Arulrajah & Opatha, 2016).

Resource-Based View (RBV)

The RBV emphasizes the strategic importance of internal resources and capabilities in achieving competitive advantage. GHRM contributes to this by developing human capital that is environmentally conscious and skilled in sustainable practices. By fostering green competencies, organizations can enhance their sustainability performance and differentiate themselves in the market (Arulrajah & Opatha, 2016).

Stakeholder Theory

Stakeholder theory underscores the significance of addressing the interests of all stakeholders, including employees, customers, suppliers, and the community. GHRM practices, such as involving employees in environmental decision-making and promoting green values, reflect a commitment to stakeholder engagement and corporate social responsibility (Arulrajah & Opatha, 2016).

Ability-Motivation-Opportunity (AMO) Theory

The AMO framework suggests that employee performance is a function of their abilities, motivation, and the opportunities provided by the organization. GHRM leverages this by implementing training programs to enhance environmental competencies (ability), offering incentives for green behaviors (motivation), and creating participatory structures for environmental initiatives (opportunity) (Arulrajah & Opatha, 2016).

Social Exchange Theory

This theory posits that social behavior is the result of an exchange process aiming to maximize benefits and minimize costs. In GHRM, when organizations invest in green practices and demonstrate environmental responsibility, employees reciprocate with positive attitudes and behaviors, such as increased engagement in sustainability initiatives (Tran, 2023).

Contingency Theory

Contingency theory asserts that organizational effectiveness results from fitting characteristics of the organization, such as its structure and practices, to contingencies that reflect the situation of the organization. GHRM practices must be tailored to the specific environmental context and organizational culture to be effective, acknowledging that there is no one-size-fits-all approach (Arulrajah & Opatha, 2016).

The theoretical frameworks of GHRM provide a comprehensive understanding of how HR practices can be aligned with environmental objectives. By integrating insights from institutional theory, RBV, stakeholder theory, AMO theory, social exchange theory, and contingency theory, organizations can design and implement HR strategies that not only enhance environmental performance but also contribute to overall organizational effectiveness.

Methodological Approaches Employed in the Literature

The studies reviewed employ a variety of methodological approaches, including:

1. Quantitative Methods: Surveys, structural equation modeling (SEM), partial least squares SEM (PLS-SEM), and fuzzy-set Qualitative Comparative Analysis (fsQCA) are commonly used to analyze relationships between GHRM practices and outcomes (e.g., Zhang et al., 2024; Zhao, Wang, et al., 2024; Yan & Hu, 2021).
2. Qualitative Methods: Case studies, semi-structured interviews, and archival data analysis are used to explore contextual factors and develop theoretical insights (e.g., Napathorn, 2021; Parng et al., 2021).
3. Mixed Methods: Some studies combine qualitative and quantitative approaches, such as using interviews to develop constructs followed by surveys to validate them (e.g., Zhao, Zhu, et al., 2024).
4. Scale Development: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are used to develop and validate measurement scales for constructs like employee green behavior (e.g., Roy & Sia, 2024).

Quantitative Method

Various quantitative approaches have been used in the analysis of GHRM practices and their outcomes, such as survey methods, structural equation modeling (SEM), partial least squares SEM (PLS-SEM), and fuzzy-set Qualitative Comparative Analysis (fsQCA). They help comprehend multi-level interactions and mediating factors attaining the effectiveness of GHRM practices.

Structural Equation Modeling (SEM)

SEM is extensively used to analyze the links between GHRM practices (independent variables) and potential outcomes within organizations like intrinsic motivation and environmental performance. For example, Jamil et al. (2023) employed SEM to analyze the relationships among GHRM practices, job satisfaction, and environmental performance in the education sector and to illustrate the mediating role of green organizational culture. Similarly, Balouch et al., applied SEM to investigate the relationships between GHRM, environmental behaviors, green transformational leadership and green innovation performance, by focusing on environmental knowledge as a mediator (2023).

Partial Least Squares SEM (PLS-SEM)

Particularly for exploratory research, analyzing complex model with multiple mediating, moderating variables, PLS-SEM model, is an application of Partial Least Squares techniques in SEM. Using this method has also allowed researchers to incorporate it with Structural Equation Modelling (SEM) in studies exploring the relationship between GHRM and organizational performance, and it has proven its capability of dealing with complex relationships and non-normal data (Gazi et al., 2024).

Surveys

Second, surveys are a primary data collection method widely employed for capturing GHRM practices and their impacts at the organizational level. Since these are used along with SEM and PLS-SEM, data were collected from educational institutes and organizations to gauge the efficiency of GHRM initiatives (Gazi et al., 2024; Jamil et al., 2023). Reading the results of such surveys, we have to acknowledge that despite the valid information provided, self-reporting makes them vulnerable to biases and represents only a single moment in time in the GHRM practices, without the context of the industry, location, company values and other factors.

Fuzzy-set Qualitative Comparative Analysis (fsQCA)

Without further assumption from the studies provided, fsQCA also provides another qualitative perspective by further exploring the causal complexity of the data to complement the existing studies. This encourages researchers to appreciate the configurations of conditions that bring about particular outcomes — not just the relationships between variables. The fsQCA in GHRM research is applicable in the case of unpacking the interactions between GHRM practices as each practice may not produce a linear effect on organizational performance. Future research could also be enriched by integrating fsQCA with quantitative methods to obtain a broader understanding of the dynamics of GHRM (Chang et al., 2024).

Qualitative Method

Disciplines benefit from qualitative techniques as case studies, semi-structured interviews, and archives data analysis because are necessary to understand contextual factors and formulate theory. These methods enable the in-depth exploration of complex phenomena, offering

detailed and nuanced accountings that numbers alone cannot fully tell. Using these methods, academics develop complex accounts of social, cultural, and organizational processes.

As a method of analysis, case studies are a compelling way to study one case in a larger context that makes for richer disciplines like organizational management, policy analysis, and ethnomusicology to call on. In the study of organizations they reveal critical variables and processes of change, with lessons for understanding how management practices measure and evolve over time (Basseches et al., 2024; Cherkaoui et al., 2024). Likewise, in ethnomusicology, case studies combine interdisciplinary approaches that locate musical traditions in their historical and cultural aspects (Leburić & Vladić-Mandarić, 2024).

Semi-structured interviews focus on particular subjects related to the objectives of the research study, but they allow the researcher to probe questions based on the responses given by the interviewee, which provides flexibility to explore the experiential data. It works especially well when you're trying to look at one's personal perceptions, motivations, and behaviors.

Archival data analysis, another key qualitative method, is the analysis of existing records to reveal patterns and derive insights. This method is particularly valuable in disciplines that rely heavily on historical context, like ethnomusicology. Through the analysis of a variety of archival sources—such as diaries, newspapers, and audio-visual material—researchers are able to not only reconstruct historical musical activity but also its evolution across various social environments (Leburić & Vladić-Mandarić, 2024)(Leburić & Vladić-Mandarić, 2024).

These qualitative methods offer full coverage to the analysis of complex social and cultural phenomena. The ability to capture depth, context and nuance make them essential tools for researchers looking to formulate richly textured theoretical understandings across disciplinary domains.

Mixed Methods

Mixed method research, or research that collects both qualitative and quantitative data, is valuable in the field of Green Human Resource Management (GHRM) research due to its ability to provide holistic understanding of the impact of GHRM on employee behavior and subsequently on organizational performance. This strategy capitalizes on the strengths of both qualitative and quantitative methodologies—qualitative methods identify underlying mechanisms and contextual factors, while quantitative methods test and generalize findings. Mixed methods research utilizes these three approaches to provide greater understanding of the causal mechanisms underlying GHRM practices and its implications.

During the qualitative portion, researchers can use methods like interviews and case studies to see how GHRM affects employee attitudes and behaviors. It also identifies important moderators and boundary conditions that influence the effectiveness of GHRM efforts. Indeed, qualitative studies suggest that aspects including Environmental Specific Psychological Empowerment (ESPE) and employee altruistics are important for understanding how GHRM leads to green creative behavior (Farrukh et al., 2024). These insights form a conceptual basis for more empirical testing.

Then comes the quantitative phase, where these insights are validated using surveys and statistical models, ensuring their broader applicability and reliability. It is widely applied in SEM or structural equation modeling techniques to examine GHRM, employee engagement,

and environmental knowledge connectivity. For example, SEM showed GHRM practices improve employees' environmental knowledge and green values, with environmental knowledge serving as a mediating factor (Amanullah et al., 2024). These findings effectively confirm and quantify trends that were noticed in qualitative research first.

Mixed methods research offers a rich understanding of and context for GHRM's influence, and is one of the main advantages of this approach. The combination of qualitative and quantitative approaches enables researchers not only to uncover complex interactions but also to validate and improve theoretical models that may not be revealed through a single-method approach (Anshima et al., 2024; Farrukh et al., 2024). Moreover, data triangulation from various studies in the consideration proves the validation and reliability of the research findings which minimizes the bias and the confidence readers can have on the outcomes (Kalei, 2024; Ramadhani et al., 2024).

In conclusion, mixed methods research provides a well-balanced and methodologically robust approach to GHRM studies, serving to ensure that the theoretical insights derived are both contextually rich and empirically grounded. Additionally, this lens provides exploratory and confirmatory research potential of GHRM practices over organizational settings that fall under fuzzy implications with broadened outcomes.

Scale Development

In the domain of Green Human Resource Management (GHRM), measurement scales play a crucial role, and their development & validation will require systematic efforts involving Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) for constructs like Employee Green Behavior (EGB). The focus is on using statistical approaches to make sure that the measures we use to tap into these complex behavior constructs are appropriate measures to use. This refers to exploratory factor analysis (EFA) (used to discover the underlying structure of a dataset by analyzing patterns in the covariance of a number of observed variables and using that to group variables with a common factor) as well as confirmatory factor analysis (CFA), which tests a hypothesized factor structure. The combination of these three approaches contributes to the construction of solid and empirically valid measurement scales.

EFA is used in the first step of the scale development process to test for common factors without a predetermined model. It specifies the number of latent constructs and how observed variables load on these factors. In organizational behavior research, EFA has been employed for measurement item refinement and content validity assessment during the development of measuring items or behavioral scales (Niangchaem et al., 2024). In a similar vein, EFA was used to identify dimensions of the NENA-q model that were validated with CFA (Baharum et al., 2023). This exploratory mechanism ensures that only the statistically significant, most relevant items are taken for further validation.

After defining the factor structure using EFA, CFA is conducted to validate and improve the model by levels of how well the observed variables fit the latent constructs. CFA is a theory-driven approach involving the specification of the expected relationships among the variables beforehand. For instance, in the shipping industry, CFA was used to validate EGB scale (Nurcholis et al., 2024), proving its reliability and construct validity. Likewise, CFA has been applied to validate the NENA-q model (Baharum et al., 2023), evaluating construct validity

with fitness indices, as well as convergent validity. The measurement model can be validated scientifically to make sure it's valid and applicable on general level.

Particularly, the use of EFA and CFA is an important consideration in Green HRM as they measure the impact of sustainability-oriented HR practices on employee behavior. CFA has also confirmed the relationship between hotel green HRM practices, such as green recruitment and training, and employee green behavior (Hông et al., 2024), for example. In the context of GHRM, structural equation modeling (SEM) evidence of the relationships between GHRM as a dependent construct and environmental knowledge and green values as antecedents has also been established (Amanullah et al., 2024); all emphasizing the importance of using valid measurement tools appropriate to the theory development stage.

The use of EFA and CFA in scale development ensures that the measurement scales in the field of GHRM are both theoretically sound and statistically valid. These approaches help achieve better measurement of employee green behavior and its antecedents by enhancing item selection, validating factor structures and verifying construct relationships.

Conclusion

Green Human Resource Management (GHRM) is an essential aspect for remaining sustainable, and driving employees towards eco-behavior, which prevails as required for enhance environmental performance. The results highlight that GHRM is not just an HR process but a lever for the sustainable development when institutional pressures and managerial styles are considered alongside contextual aspects.

Designing a sustainable culture: Each organization must embed a green leadership style, a structured environmental education program, and performance management systems that promote sustainable behavior through behavioral modification. The discussion provides a clearer understanding of leadership as a critical enabler of green behaviors; transformational- and environment-specific leadership styles particularly reinforce green behavior. In addition, the notion that psychological climate and corporate environmental strategy, together with employee engagement, is expected to be positively associated with GHRM, indicates the multi-dimensionality of GHRM.

Such insights strengthen the argument for integrating sustainability into the HRM function to align long-term environmental and economic outcomes. However, the effectiveness of GHRM can be bolstered in relation to industry-specific challenges, geographic variety and methodological improvements in future investigations. Further, the prospects of artificial intelligence and big data analytics can be explored to implement GHRM more effectively to ensure sustainability in organizations. Filling these gaps and fine-tuning practical applications for GHRM can thus provide the groundwork for the sustainable transformation of enterprises.

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