

Review

# Evidence-Based Green Human Resource Management: A Systematic Literature Review

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**Abstract:** To better understand the empirical development of green human resource management (GHRM) research and theories and to provide evidence-based suggestions, the article conducts a systematic review of evidence-based studies within the academic field of GHRM. The review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Protocol 2020 to select GHRM-focused and highly qualified articles, published in the final stage by the end of December 2022 and written in English from the Scopus and Web of Science Core Collection databases. Independent assessments of studies were performed by two researchers in the selection and analysis process, and bibliometric and statistical analyses were applied to synthesize the results from 141 articles. The results reveal the increasing interest, diversification, and tendencies of GHRM research and highlight the disequilibrium of research context and methodology, the classification and evolution of research emphasis, the mechanism for theories, the constructs, the measurements, and the framework of the literature. Based on the results, evidence-based recommendations were provided for both practitioners and researchers regarding the context and trend, access and approach, and mechanism and innovation for GHRM development. This review possesses significance as providing the original findings of detailed empirical GHRM research context, the relationships between GHRM practices dimensions and measurements, and the interrelation of theory application and framework design. Despite the discoveries having the potential to offer scholars and practitioners GHRM suggestions with a reliable basis, the authors recognize the scope of the current review is limited and call for verification of current findings with a wider range of studies.



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**Keywords:** green human resource management; systematic literature review; empirical research review; PRISMA 2020

## 1. Introduction

Rising from environmental problems such as pollution, intensive energy shortages, and severe climate changes, environmental sustainability has gradually become a hot topic that raises concern among governments, enterprises, consumers, and scholars [1–3]. On the one hand, international terms and legislative regulations on environmental issues, like the Kyoto Protocol and Paris Agreement, have been implemented in different countries in response to address such problems, forcing organizations in every sector to “go green” [4]. On the other hand, global collaborations boosting environmental improvement provide benefits for those enterprises participating in “green action”, like the tariff reductions on environmentally friendly products that had been reached in the Asia Pacific Economic Cooperation (APEC) forum among the member nations. Both challenges and opportunities of environmental sustainability have stimulated organizations’ awareness of “getting green” [5].

The enduring economic recession caused by various factors, including the COVID-19 pandemic and the volatile international situation, has led stakeholders to attach increasing importance to “green values.” This is reflected in the rising significance of “green

issues” such as green products, corporate social responsibility (CSR), green business values, and green managerial practices [6]. The pressure to adopt green initiatives from stakeholders has resulted in green innovation, which is becoming a popular solution for overcoming challenges and achieving sustainable development [7,8]. Environmental programs have been carried out in different facets of the operation, and green innovation has been treated as an essential factor in sustainable development that offers competitive advantages [9,10]. Extensive research has been conducted on green management models and methods, as well as practices for acquiring green capabilities that result in desirable sustainable performance [10–12].

Among all these tools organizations employ for pursuing “green”, human resource management has been claimed to have played a strategic role in this green agenda [1,13,14]. HRM should be able to communicate and support organizations’ strategic visions and goals, thereby contributing to the success in the implementation of strategic objectives and organizational outcomes [15]. Therefore, in response to the need for green, embedding green values and practices in HRM goes without saying.

The concept of green human resource management (GHRM) was established as a new area that attracted practitioners’ and academics’ attention in the last two decades [1,16–18]. Efforts have been put into finding the roles of human resource management in the process of “green”, and both scholars and practitioners want to know how and to what extent GHRM can contribute to environmental management and sustainable development.

### 1.1. State of the Art of GHRM

Originating from organizational motivation to merge sustainability into daily operation and management, it was not until the research carried out by Renwick et al. [19] that GHRM was gradually studied more systematically and separately in the HRM area [20]. GHRM has been explored by countless researchers regardless of its origin as the HRM facet of environmental management [17,18,21–23], which has been considered a significant challenge for organizations to adapt their employees to environmental issues. While earlier studies have defined GHRM as human resource practices or functions related to organizational environment management [14,24,25], recent articles tend to extend these functions related to “green”, namely the strategic roles of promoting organizational performance and employee attitudinal and behavioral changes during the process of adopting environmental management practices [26,27]. To avoid the concern of unclear terminology, the present review orientates the working definition of GHRM, aligning with the latter.

Various theories have been introduced into GHRM research, like the Ability (A), Motivation (M), and Opportunity (O) theory [28]; resource-based view (RBV) [29,30]; stakeholder theory [31]; signaling theory [32]; supply–value fit theory [33,34]; and so on. Established on these theoretical bases, the research framework of GHRM was gradually filled up and expanded with antecedents, mediators, moderators, and outcomes. For instance, GHRM was found can exert effects on employee and organizational performance [27,35] while also being affected by employee values and organizational culture [36,37].

In addition, the integration of Strategic HRM and environmental management was proposed [18], challenging scholars and practitioners to work on the intersection of these two areas. Multi-disciplinary works, like integrated studies on GHRM and green supply chain management (GSCM) [20,38,39], have emerged to fulfill the requirement of new perspectives that consider the ultimate goals of organizational strategies.

Both practical and academic evidence show the necessity and great opportunities in GHRM research; however, the existing literature and knowledge on empirical results remain unstructured and fragmented. As a great number of empirical research was conducted on GHRM and the literature is also scattered in variables as well as context selections, it is difficult to design the research framework and find the population that has not been targeted. In addition, for GHRM researchers, the theoretical bases and measurement scales are also hard decisions to make, as currently, there are too many to choose from. Thus, a

systematic review tackling these issues is imperative, which helps reveal the research gaps and topics for further study.

### 1.2. Previous Reviews of GHRM

With the remarkable expansion of research activities pertaining to GHRM, researchers have conducted reviews on GHRM studies to understand the state and trends in the GHRM discipline. Previous literature reviews have explored and presented analyses of basic characteristics of previous GHRM research, such as publication year and nationality, and perspectives on the conceptualization of GHRM, like theoretical basis and research framework [14,16,27,40–44]. However, to some degree, the existing literature reviews remain incomplete for understanding GHRM research and unreliable for decision-making.

Through these reviews, an understanding can be gained of “what” GHRM is and “how” it works, namely the dimensions of GHRM and the relationships between GHRM and other variables. However, the interpretation of how different dimensions of GHRM have been performed and how different theories have been applied in the relationships between GHRM and other variables in the empirical test are hardly found. Thus, the actual effectiveness of GHRM practices and the fitness of different theories and models are unknown. A recent systematic review conducted by Chowdhury, Mendy, and Rahman also emphasizes the needs and benefits of detecting the degree of GHRM practices’ effectiveness in different models [44].

Found in previous review papers [14,40–42], GHRM is a multidimensional construct, and current academics have investigated five major dimensions, viz., green recruitment and selection, green training and development, green performance management, green compensation and rewards, and green employee involvement and empowerment. The GHRM construct was studied as a “bundle” practice in some research [38,45] while tested separately in others [46,47]. Some studies even included just one aspect of GHRM in their research [48–50]. However, currently, literature reviews that included keywords of different aspects of GHRM have not been found, which infers incomplete searching in previous works. For instance, the study carried out by Cop et al. [49] investigating green training and its relationship with perceived behavioral control, environmental commitment, and organizational citizenship behaviors in hotels was not included for analysis by any of the previous reviews.

It is worth mentioning that most of the previous reviews have not distinguished empirical research from conceptual or review research, except for the review conducted by Benevene and Buonomo in 2020, which included 48 evidence-based papers [16]. In the real world, the untested theory might be wrong or not fit for certain academic fields, and the same question could contradict answers in different research contexts. Managers seek the “best evidence” to make decisions, while scholars also look for evidence to support the research [51].

### 1.3. Aims of the Research

Numerous empirical studies on GHRM have tested different theories and frameworks across diverse contexts, yet there is a notable scarcity of literature reviews that specifically assess the empirical development of GHRM research. Therefore, a thorough and systematic examination of the empirical studies on GHRM to uncover and synthesize the related evidence in this field is necessary.

The objective of the present study is to explore the existing empirical GHRM literature in terms of the research characteristics and tested results, thereby better understanding the empirical development of current GHRM research. For this purpose, the overarching goal of this systematic review is to address the following questions:

RQ1. What is the status quo of empirical GHRM research?

RQ2. How has GHRM been conceptualized and measured in empirical studies? How have different theories been applied for interpreting the research framework of GHRM in empirical research?

RQ3. What are the suggestions that can be offered for future GHRM development based on evidence-based results?

To address the questions, the current study adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 (PRISMA) [52] approach, which is elaborated in the next section, to develop a review of the empirical evidence of GHRM. Then, in the results section, descriptive and statistical analyses were conducted on empirical GHRM research's basic characteristics (i.e., year, source, geographic and industrial context, methodology), foci and trends (i.e., research stream and highly cited papers, research keywords evolution), conceptualizations and framework (i.e., GHRM dimensions and its relevance with measurement scale and the relationship between theory application and framework design). Finally, the conclusion section presents the contributions of the current study, recommendations for future research on GHRM, and research limitations.

Systematic reviews investigating evidence-based studies can enhance the legitimacy and authority of the resulting evidence, offering scholars and practitioners an understanding of the real situation and a reliable foundation for decision-making and action [53]. By using the PRISMA protocol, renowned for its extensive review process [54,55], this paper has the potential to assess the previous research and offer more precise analysis and recommendations for future investigations systematically and transparently. To the authors' best knowledge, this work is also the review that first explores and analyzes the following: (1) the detailed industry context in empirical GHRM studies; (2) the single and bundle practices of GHRM and their relationship with measurement scales in empirical studies; and (3) the application of theoretical foundations in empirical GHRM research and their relationship with research framework design.

## 2. Methods

To address the questions and attain the objectives of this research, a methodological approach of systematic review introduced by PRISMA 2020 is adopted in this study. The investigation of this systematic literature review is conducted and guided by the PRISMA 2020 checklist as well as the flow diagram [52], going through three sequences of stages: identification, screening, and inclusion. The results of the studies included are analyzed and presented by following the PRISMA 2020 statement for reporting systematic reviews with the help of VOSviewer software, software for constructing and visualizing bibliometric networks [56–58], and MS Excel.

### 2.1. Identification: Information Sources and Search Strategies

#### 2.1.1. Information Sources

This research aims to find out what empirical studies have been carried out with valid results in the GHRM research area. Web of Science Core Collection and Scopus databases are employed for searching, as they are repositories that bring together the journals with the highest impact in the social sciences [59] and with relatively high quality and widely accepted [60].

#### 2.1.2. Search Strategies

The keywords for searching were identified through modified searching code from pilot tests of "Green Human Resources Management (GHRM)" as well as including subtopics in GHRM research terrain mentioned in the most cited GHRM article written by Renwick et al. [14] and one of the latest and most extensive review from Benevene and Buonomo [16], to conduct more comprehensive searching over studies of GHRM. After pilot tests, it was found that including the keyword "empirical" and excluding the keyword "review" were inappropriate search criteria. The use of "empirical" as a search term would exclude articles without this word, while excluding "review" would result in missing empirical studies that include a literature review section.

For the purposes of this study, there are several eligibility criteria set for automatic filters. The journal articles published in the final stage until the end of December 2022,

which were written in English, were searched for this review. Articles that were not in the final publication stage and articles published as conference papers or other kinds of materials were not included, as they were considered not available in full for in-depth analysis [20,61]. The decision of “end of December 2022” was to include the most recent publications that have contributed ideas to this significant topic. Searching contexts were also limited to the most relative field, and Table 1 presents the search strategies and results in the two chosen databases, respectively.

**Table 1.** Search strategies in WOSCC and Scopus databases.

Database	Search Terms	Eligible Criteria Set in Automatic Filters
	N = Initial Records (searching date)	n = Records marked as ineligible
Scopus	TITLE-ABS-KEY = (“green hr*” OR “green human resource*” OR “green attract*” OR “green recruit*” OR “green select*” OR “green train*” OR “green performance manag*” OR “green performance apprais*” OR “green pay*” OR “green compensat*” OR “green reward” OR “green employee*”) N = 963 (19/04/2023)	Publication years: 2022 Document type: Article Source type: Journal Publication stage: Final Subject Area: Business, Management, and Accounting Language: English n = 636 (excluded)
Web of Science Core Collection	TS = (“green hr*” OR “green human resource*” OR “green attract*” OR “green recruit*” OR “green select*” OR “green train*” OR “green performance manag*” OR “green performance apprais*” OR “green pay*” OR “green compensat*” OR “green reward” OR “green employee*”) N = 796 (19/04/2023)	Publication years: 2022 Document type: Article Publication stage: Final Language: English Citation Topics Meso: Management Research Area: Business Economics, Environmental Sciences Ecology, Social Sciences Other Topics n = 406 (excluded)

The search contexts were limited to “Business, Management and Accounting (Subject Area)” in Scopus and “Management (Citation Topics Meso)” and “Business Economics, Environmental Sciences Ecology, Social Sciences Other Topics (Research Area)” in Web of Science Core Collection, excluding subject areas like “Energy” and “Environmental Science” that might contain the searching keywords but focus on other topics rather than GHRM.

The detailed information of the articles searched out from the databases was exported to MS Excel for the initial round of selection, articles that appeared in both databases were collected, and duplication was excluded, leaving 250 articles at this stage.

## 2.2. Screening: Selection Process and Criteria

The identified records in two databases are integrated and reorganized in a new MS Excel spreadsheet for screening and data collecting. To ensure the quality of the inclusion, articles published in journals that were not ranked Q1 or Q2 in both databases were excluded (n = 61). Two reviewers (A and B) were asked to independently screen the titles and abstracts of the collected records and place marks (“Yes” for including the records, “No” for excluding the records, “Re” for records not sure for including that need to decide after looking into the full-text) on each article based on the exclusion criteria: (1) studies are focused on other topics or subject areas than GHRM; (2) GHRM is not the major construct(s) studied in the research but in other forms like future suggestion; and (3) studies have not conducted empirical research on GHRM or GHRM practices. In case of disagreement, the consensus was reached by discussion.

After the reviews of the titles and abstracts, the records with the mark “Yes” by both reviewers (A and B, n = 137) were screened in full text by one reviewer (A or B), the records with the mark “No” by both reviewers (A and B, n = 45) were excluded. The studies with inconsistent marks or that had been marked with “Re” were assessed again in detail by both reviewer A and reviewer B (n = 7) by screening the full texts independently; those

within the exclusion criteria were excluded ( $n = 3$ ), and vice versa. Uncertainties about eligibility were resolved through discussion.

### 2.3. Included: Data Processing and Analyzing

At this stage, 141 articles were determined as eligible records and were included for conducting review and analysis. For processing the data, the first author extracted and collected data from the included articles, then presented the selected characteristics of the studies and used MS Excel to categorize the information (e.g., titles, author names, context, etc.). To address the risk of bias in results analysis, the second author checked the organized data, and disagreements were discussed until reaching a consensus. Finally, VOSviewer, together with MS Excel, was used for analyzing and presenting the results.

Figure 1 presents the methodological approach of the current study, including the three sequences of stages following the PRISMA 2020 protocol. Some of the items (e.g., effect measures, certainty assessments, etc.) in the PRISMA checklist were not included in this review since they did not apply to the field of this study.

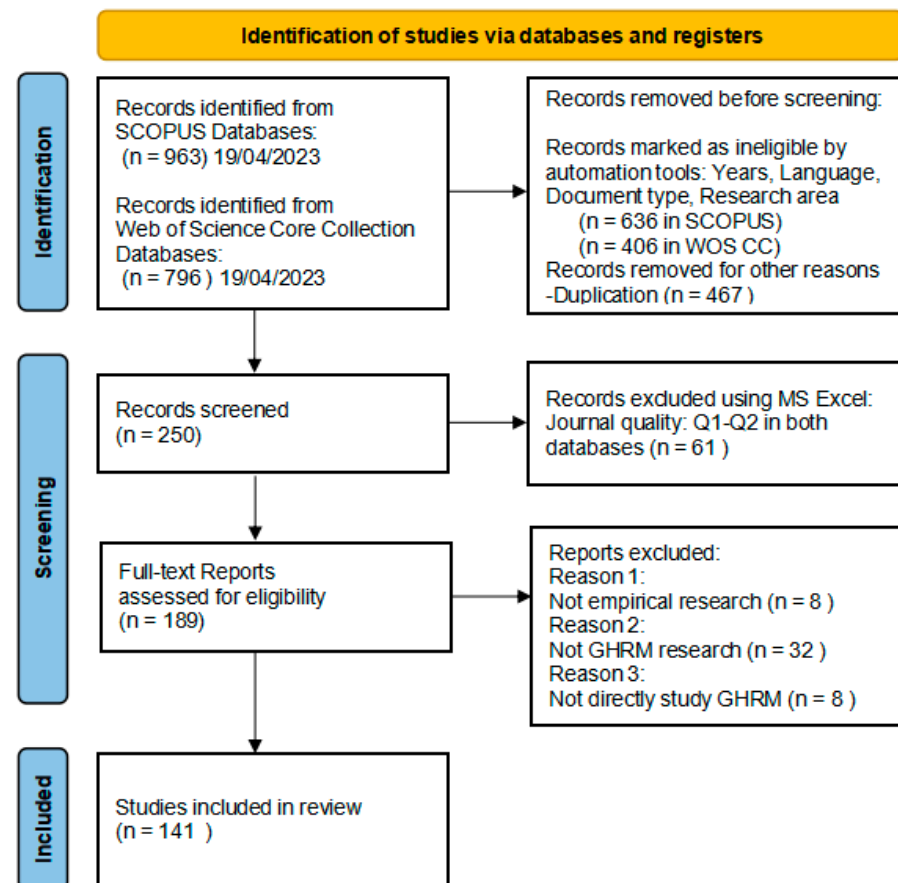


Figure 1. PRISMA 2020 flow diagram for the current study.

## 3. Results and Discussion

Following the PRISMA protocol, the empirical GHRM research published with high quality is sorted out for further analysis. To probe into the GHRM studies and delineate the research trend, this section will: First, present the basic characteristics of the reviewed articles. Second, carry out a co-occurrence analysis through VOSviewer to discover literature emphases and trends. Finally, synthesize the results into several critical dimensions for conducting GHRM research.

### 3.1. General Overview of GHRM Literature

#### 3.1.1. Publications by Years

The first empirical study focusing on GHRM within present screening results was published in 2013 [62]; Figure 2 depicts the trend of publication numbers by years from 2013 to 2022. A significant increase after the year 2018 is revealed, with 2022 ( $n = 46$ ) having the highest volume of publications in a publication year, which has also been reported in recent review papers [16,40]. Although the increasing rate dropped in the year 2020 and 2021, which can be explained as COVID-19 delayed field research [63], the temporal evolution of GHRM research volume demonstrates its increasing importance.

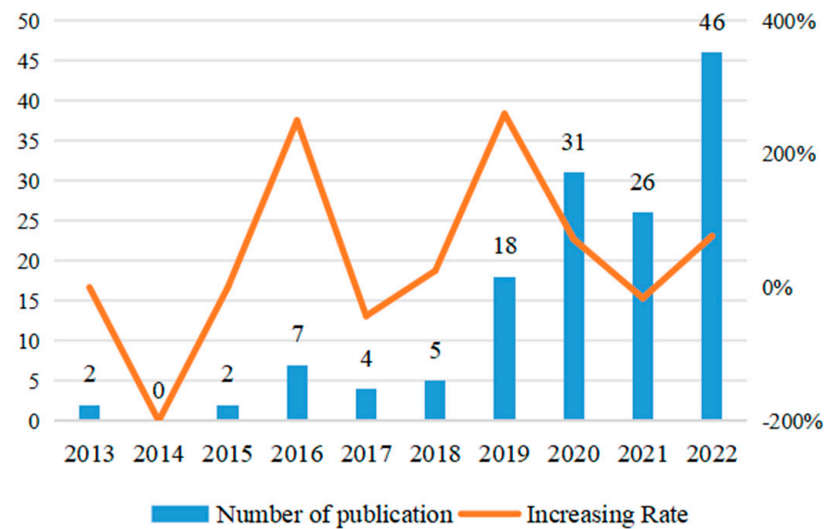


Figure 2. Number of empirical GHRM research publications by years.

#### 3.1.2. Publications by Sources

Among the 36 sources from 11 publishers that published the 141 reviewed studies, Elsevier is the publisher that produced the most ( $n = 50$ , 35.46%), and the top three influential journals are (1) Journal of Cleaner Production ( $n = 33$ ), (2) International Journal of Manpower ( $n = 20$ ), and (3) Corporate Social Responsibility and Environmental Management ( $n = 10$ ). As observed in Figure 3, GHRM has gradually become a topic catching the attention of not only journals focusing on HRM but also those across disciplines, as research on GHRM has integrated different research scopes, such as environmental management, with HRM [5].

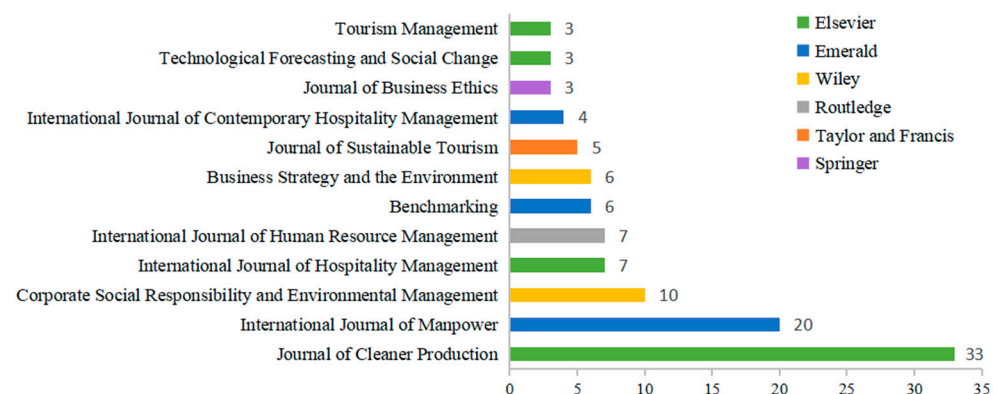
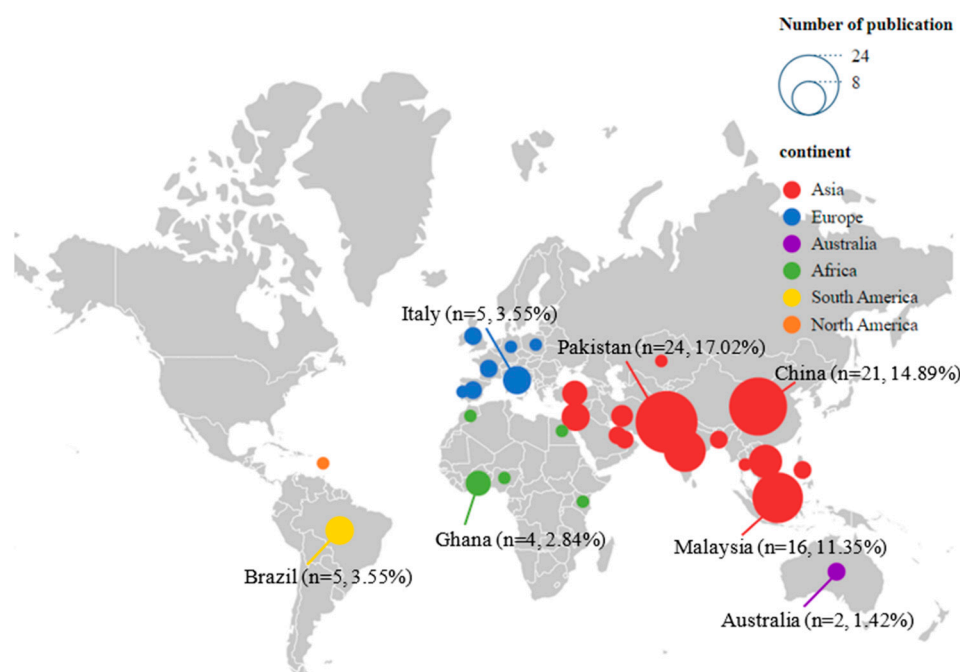


Figure 3. Number of empirical GHRM research publications by sources ( $n > 2$ ).

### 3.1.3. Publications by Contexts

Unlike the previous GHRM literature reviews that reported the authors' affiliations [40,64], this research investigates the actual context for conducting the research. As for the national and continental context of the reviewed empirical studies, 132 out of 141 studies were conducted in a single national context (93.62%), as shown in Figure 4. These studies were conducted mainly in Asian countries, with the top five countries for GHRM field studies being Pakistan (n = 24), followed by China (n = 21), Malaysia (n = 16), India (n = 11), and Vietnam (n = 7). The present study also categorized the geographic context according to the development situation. For those studies conducted in a single national context, 113 of them were identified as “developing country/district” and 19 were “developed country/district”. For the cross-nation research, four of them were examined under the combination context of “developed” and “developing” areas (e.g., Malaysia and Australia by Shafaei et al. [36]), two of them compared data among “developing” regions (e.g., China and Vietnam by Tuan [65]), and three had examined “developed” countries (e.g., British, German, and Swedish by Haddock-Millar et al. [66]).



**Figure 4.** Geographic context of empirical GHRM research (single national context).

In terms of industrial context, empirical GHRM research based in the tertiary service sector tops the results with 58 articles (41.13%). Inside this sector, the most studied industry is the hospitality and tourism industry (n = 35, 60.34%), other industries like hospital and healthcare, education, banking, etc., were also tested. The secondary manufacturing sector, in which many industries are troubled with environmental problems like pollution, accounted for the other main industrial context for conducting empirical research with 50 studies (35.46%). However, most of the studies in this sector lacked descriptions of their tested companies or industries (n = 29). Instead, they adopted the description of “manufacturing firms (companies /organizations)” or “manufacturing industry”. Surprisingly, there is only one study conducted in the primary raw materials sector [67]. Interestingly, while some researchers settled on a specific segmentation, such as the sports industry [26] in the service sector, others conducted cross-industry research (n = 25, 17.73%) covering different sectors. Moreover, there are six studies (4.55%) that had not clearly stated their company and industrial background but used terms like “ISO 14001 certified” [68] for sampling descriptions (Figure 5).



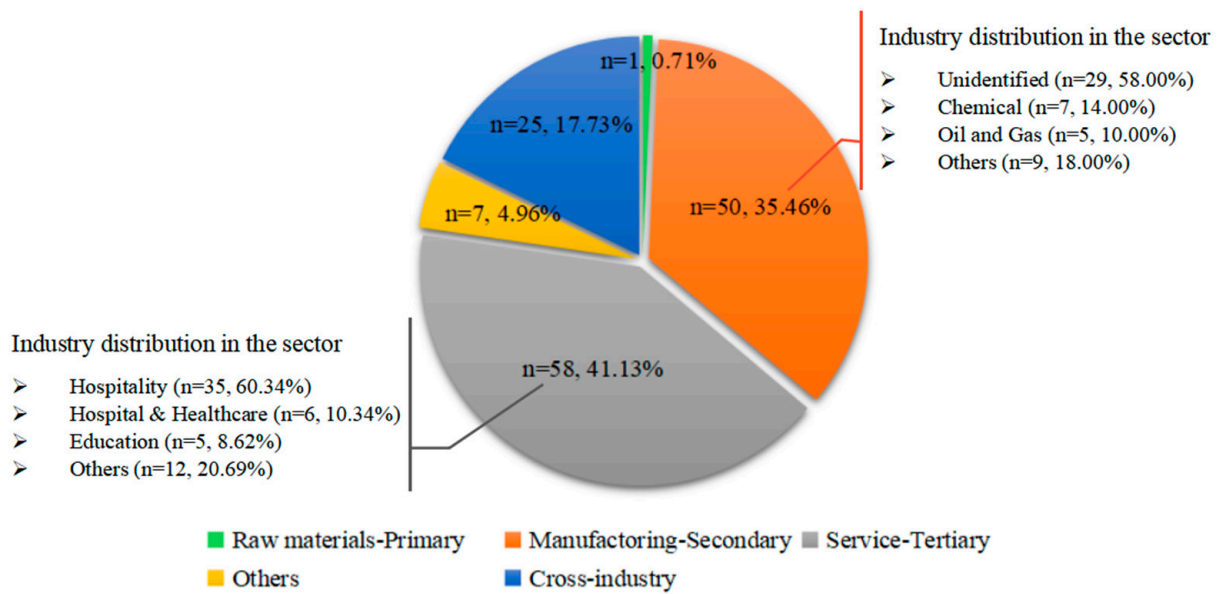


Figure 5. The industrial context of empirical GHRM research.

### 3.1.4. Publications by Methodologies

Regarding the methods adopted by GHRM research, articles are classified into three categories, namely the quantitative method (n = 123, 87.23%), the qualitative method (n = 6, 4.26%), and the mix-method (n = 12, 8.51%). As illustrated in Figure 6, the quantitative method is the primary approach for empirical GHRM research, and this conclusion was also discovered by previous GHRM literature reviews [5,16,69].

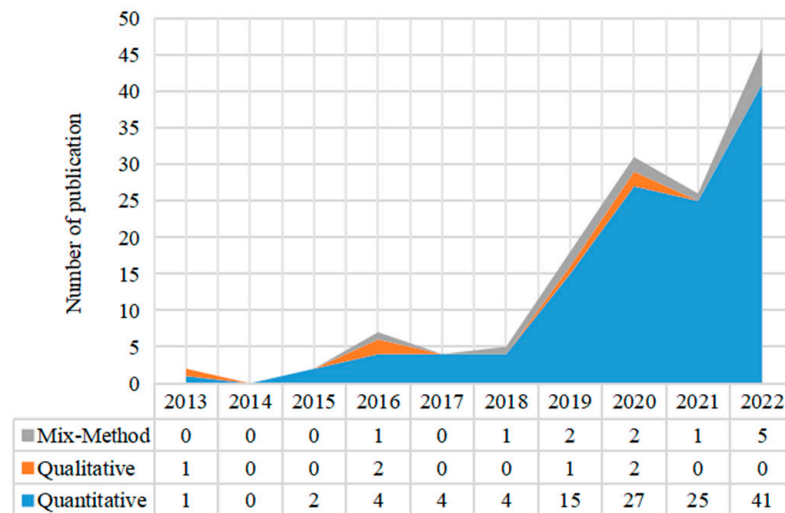


Figure 6. Distribution of research method by publication years.

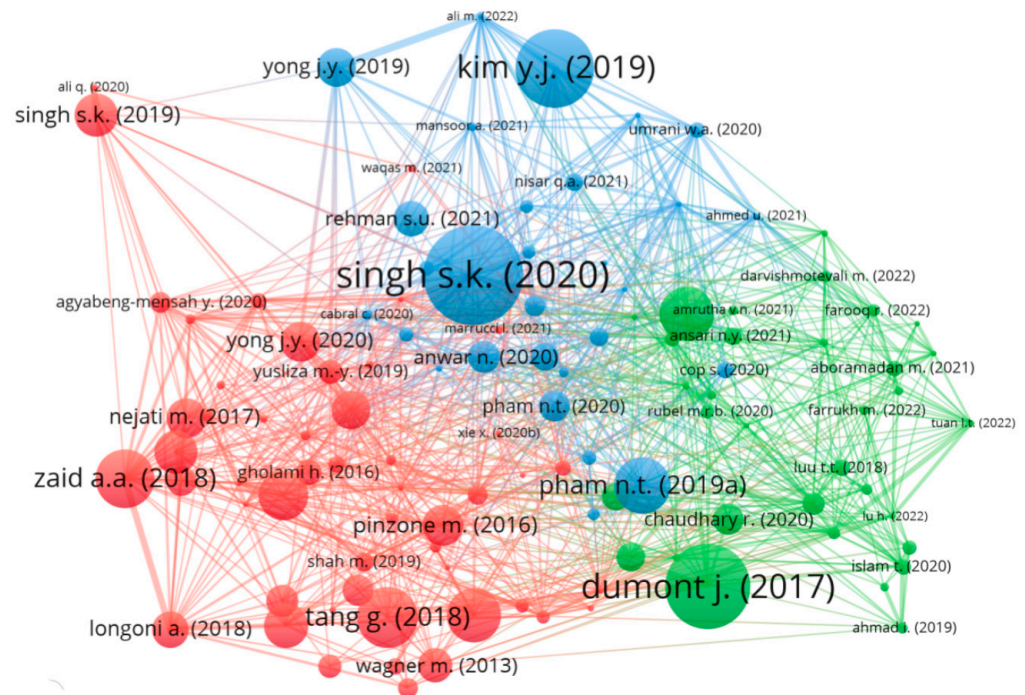
## 3.2. GHRM Research Foci and Trends

VOSviewer, an open-access software for constructing and visualizing bibliometric networks [70], is used for carrying out the bibliographic analysis of the 141 selected papers. Before running the analysis, original data is processed to improve the result validity, such as eliminating generic terms in keywords like “human” and combining phrases with the same meaning as “green human resource management” and “ghrm”.

### 3.2.1. Bibliographic Coupling Analysis

By running the bibliographic coupling (documents) analysis with a minimum citation number of 20, the links between articles can show the reference they shared, and the size of

the document node represents its influence in the current research field [70]. The cluster network analysis groups streams of literature by color [71], and three distinct clusters were detected (red, green, and blue), refer to Figure 7. Top cited papers were identified from each cluster to give a hint on how each category access to GHRM.



**Figure 7.** Bibliographic coupling map for documents cluster network analysis. (Source: Authors' elaboration by using VOSviewer).

The red cluster is composed of 52 articles published in the relatively earlier stage of the GHRM study, ranging from the year 2013 to 2020. Those studies show more interest in theory and concept developing, linking GHRM with other management systems (e.g., green supply chain management) and GHRM effects beyond environmental issues (e.g., financial performance). Among them, Tang et al. [46] (296 citations) is the most cited work. Under the urgent need for further exploring how GHRM can contribute to the world, Tang et al. [46] developed and validated a five dimensions GHRM scale, which claimed to be the first and most comprehensive measurement for GHRM.

The articles mostly conducted research on employee attitudes and behaviors that fall in the green group, counted for 34 in total. The represented research [35] used the supply–value fit theory in exploring the relationship between GHRM and individual green behavior through psychological green climate. In addition, a simple and easy-to-apply scale with six items for measuring GHRM was created; thus, a great number of papers referred to this study (436 citations).

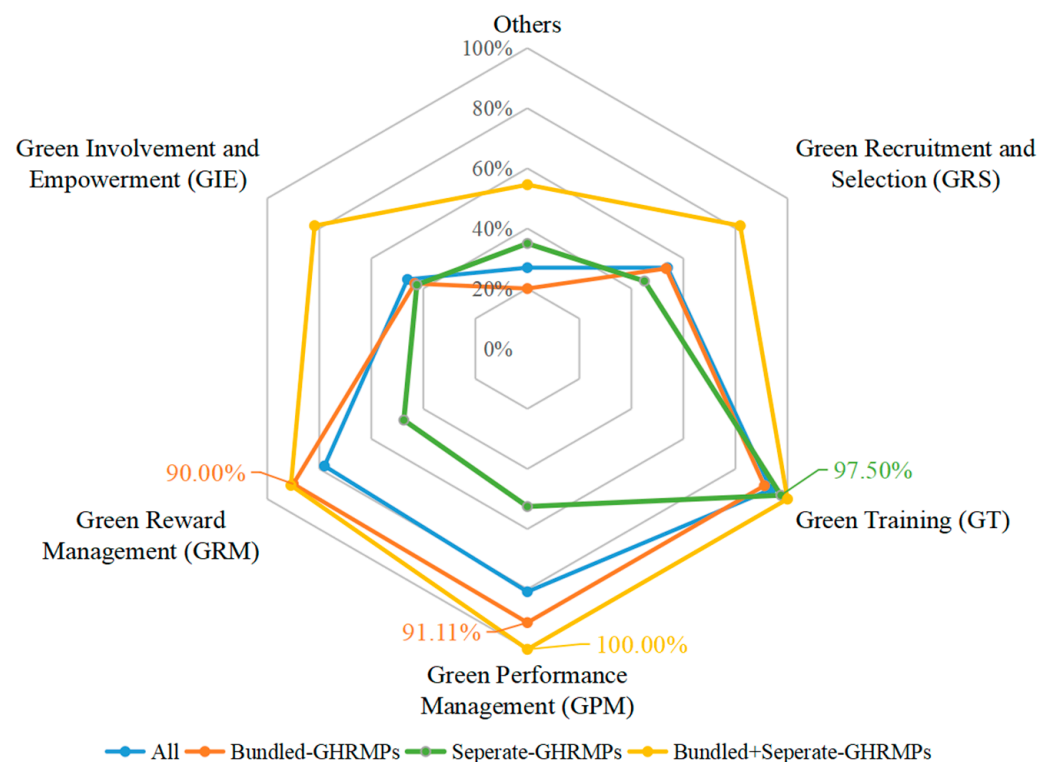
The blue stream with 30 papers can be labeled with “organization environmental performance”, where the relationships between GHRM and green organizational performance were tested under different contexts. The main reference in this stream is authored by Singh et al. [45], which was found to be the top quoted work with 520 citations. The study applied the grounded theory of Ability–Motivation–Opportunity (AMO) for grouping GHRM practices into three dimensions, namely green ability, green motivation, and green opportunity, and testified their effects on the environmental performance of firms through green innovation.

### 3.2.2. Keyword Evolution Analysis

Under the co-occurrence analysis, the minimum number of keyword occurrences is set as 2, and among the 605 keywords, 146 of them meet the threshold. Figure 8 presents



“Green Recruitment and Selection (GRS)”, “Green Training (GT)”, “Green Performance Management (GPM)”, “Green Reward Management (GRM)”, and “Green Involvement and Empowerment (GIE)” are the top five dimensions detected in the GHRM construct from reviewed papers (Figure 9). Among all the GHRM practices, GT is identified as the most examined aspect in empirical research ( $n = 132$ , 93.62%), especially favored by researchers who wanted to test specific GHRM practices separately (97.50%), while GRS and GIE are relatively less explored. Environmental training practices were able to build employees’ green value and know-how and provide opportunities for employees to participate in green issues, with this being practically crucial for implementing green organizational strategies [5,87] and theoretically essential for making the key asset, the employees, more capable and willing to make green contributions. While the studies tested that bundled GHRMPs show an obvious preference for GRM and GPM, it could be rational based on the fact that performance management and reward management are closely related to each other and often practiced by organizations and studied by researchers together [88]. Furthermore, GT appears to have more positive impacts (78.79%) on desired outcomes like employee job satisfaction (e.g., Pinzone et al. [89]), green team creativity (e.g., Ogbeibu et al. [90]), green supply chain management (e.g., Nejati et al. [75]) and firm’s environmental performance (e.g., Guerci, Longoni et al. [74]), when compared to other GHRM practices.

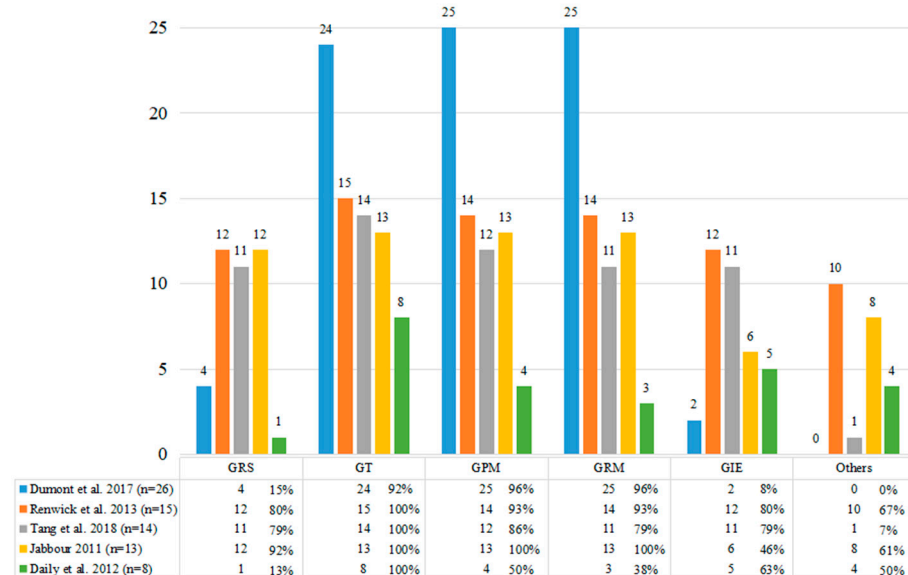


**Figure 9.** The proportion of GHRMPs studied in empirical research.

The selection of GHRMP in empirical research also influences the choice of measurement scales (Figure 10). The six-item scale developed by Dumont, Shen, and Deng [35] was found to be the most used scale for measuring GHRM ( $n = 26$ ), and all the studies ( $n = 26$ ) employed this measurement designed their construct of GHRM as bundled practices including GT, GPM, and GRM. This scale is simpler and more straightforward; however, it is also questioned for its incompleteness in examining GHRM and inappropriate adoption for research [43].

Fifteen articles were found to have prepared their measuring items of GHRM fully or partially based on the highly cited work by Renwick et al. [14]. Since it is a review paper and has not provided confirmed scales but just suggested various GHRM dimensions,

researchers extracted items from this work seem to have more flexibility in choice and include GHRM practices (category “Others”,  $n = 10$ ), like “Practice toward Union Role in Environmental Management” (Gholami et al. [26]), that are rarely seen in common-use scales.



**Figure 10.** GHRMPs studied in empirical research by measurement scales.

Another popular measurement scale for GHRM is the 18-item one ( $n = 14$ ) explored and confirmed by Tang et al. [46]. This scale has covered the five most studied dimensions presented earlier in the present review and been affirmed for its application in comprehensively measuring GHRM (Ren et al. [27]). Most researchers who followed this measurement had put GRS, GT, GPM, GRM, and GIE into their GHRM construct as a whole ( $n = 11$ ), while GRS and GRM were dropped from the research carried out by Paillé et al. [85], and Amrutha and Geetha [91] and Paillé and Valéau [92] have only extracted the items for GT. Except for these scales, researchers also developed their survey using scales from Jabbour [93] ( $n = 13$ ), Daily et al. [94] ( $n = 8$ ), and so on.

### 3.3.2. Theoretical Bases of GHRM

Among the 141 reviewed works, 69 of them have established their hypotheses based on a single theory (48.94%), 55 of them have adopted multiple theories as the rational foundations (39.01%), and 17 of them have not applied any theory (12.06%).

In line with Ren et al. [27], the current study also observed the most frequently applied theory as the Ability–Motivation–Opportunity (AMO) theory ( $n = 38$ , 26.95%). This theory is found frequently used in HRM performance research [95], illustrating why and how strategic HRM practices can promote organizational performance by influencing employees’ abilities, motivations, and opportunities to increase their contribution [28,96].

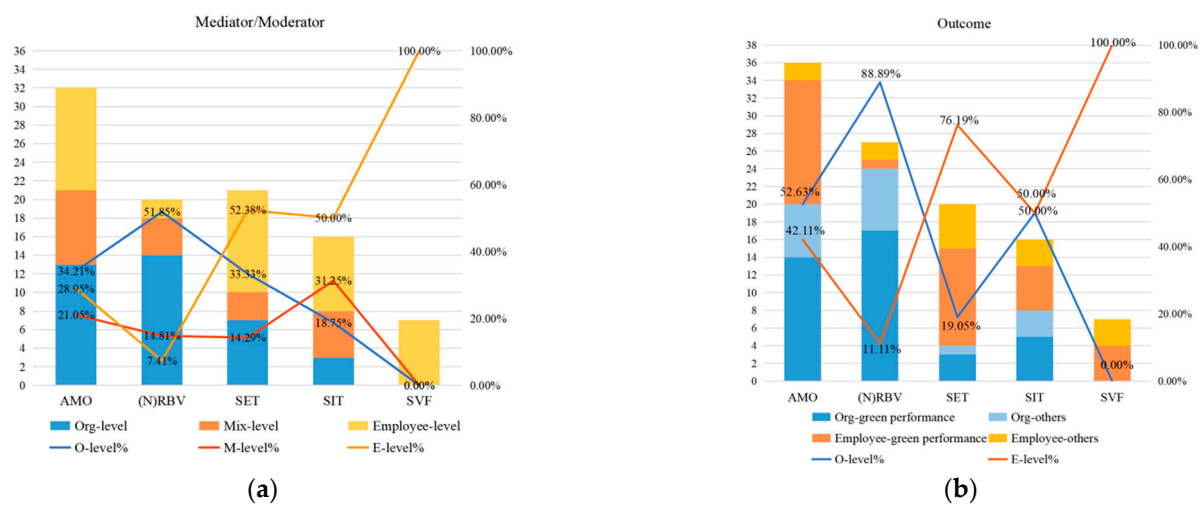
Another popular theory adopted in GHRM research is the resource-based view (RBV) ( $n = 21$ , 14.89%), stating that valuable resources can assist organizations in the form of gaining sustainable competitive advantages [29]. Recently, researchers have found the theory of natural resource-based view ( $n = 8$ , 5.67%), derived from the RBV, provides a more specific explanation for GHRM from the view of creating competitive advantage through environmental management [97].

In addition to these two major streams, an increasing number of theories have been applied in GHRM studies, such as the social exchange theory [98] ( $n = 21$ , 14.89%), social identity theory [99] ( $n = 16$ , 11.35%), supply–value fit theory [34] ( $n = 7$ , 4.96%), etc. Along with the booming growth in the GHRM research area, combining more than one theory in a single publication comes as no surprise. Instances of this include the application of

both AMO and RBV theories in Singh et al. [45]’s research, the adoption of both social identity and stakeholder theories in Adubor et al. [100]’s article, and the grouping of social exchange with supplies–values fit theories in Moin et al. [101]’s study. The integration of various theoretical perspectives in GHRM offers promising avenues for advancing the field. Nonetheless, this trend also poses significant challenges by potentially violating established frameworks and hindering the generalizability of research findings.

### 3.3.3. Framework of GHRM

The theory applications in empirical studies are found to be closely interrelated with constructs choice and framework design. When a study applied RBV as its theoretical foundation, it would be more likely to conduct organization-level research, whereas researchers who based the study on SVF or SET have the tendency to explore GHRM at the employee level (see Figure 11).

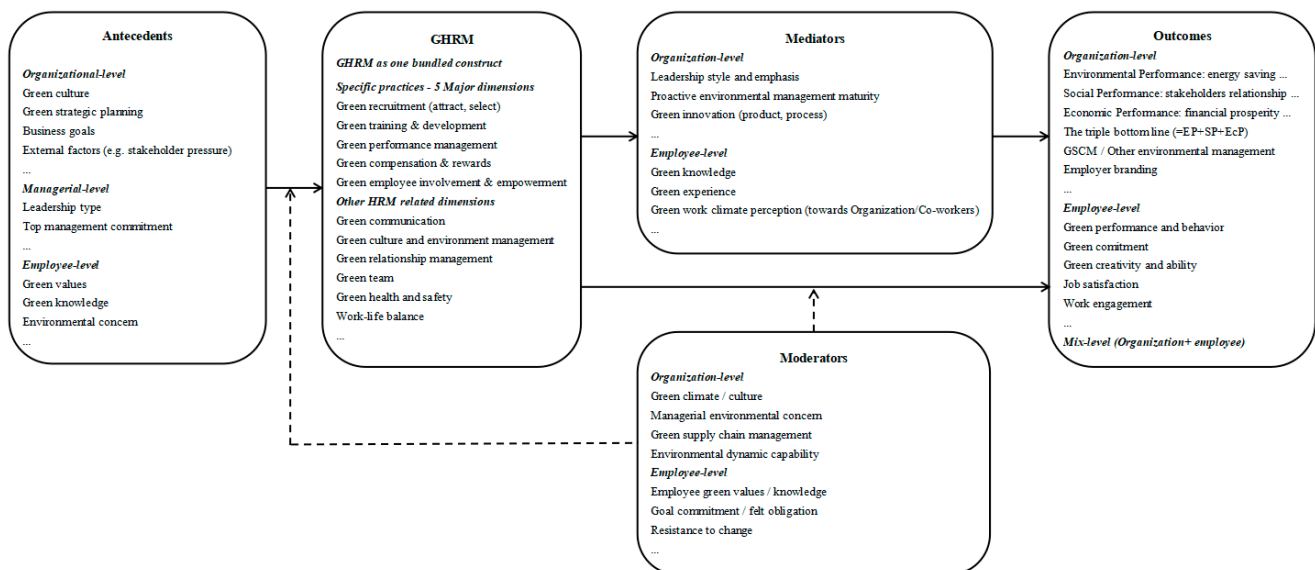


**Figure 11.** Research level analysis by theoretical bases: (a) mediator/moderator detected in GHRM empirical research by theories and research levels; (b) outcomes detected in GHRM empirical research by theories and research levels.

Most of the studies looked for how GHRM influences the “green” attitude, capability, and performance, either at the organization or employee level, regardless of the theories they applied. For instance, employee green performance [35], green commitment [5], and green creativity [102] were included in employee-level research, and on the other hand, organizational environmental performance [103], green innovation [104], and green competitive advantage [82] appeared in organization-level studies. However, with the exploration of GHRM, some “extra” effects on employees were found, including employee job satisfaction [101], work engagement [105], and turnover intention [76]. The thirst for solving the negative environmental impacts stretched to a larger scope of “strategic goals”, leading to the outcomes of GHRM being extended from merely environmental performance [45,73,74] to the triple bottom line [38,106,107]. Experts who conducted multi-disciplinary research, such as integrating GHRM and green supply chain management (GSCM), also found that GHRM was able to influence companies’ GSCM [75]. Furthermore, some even tested the relationship between GHRM and employer branding and applicant attractiveness [48,108]. Although most of the studies (74.29%) obtained results showing that GHRM has a positive relationship with the examined outcomes, it is notable that few researchers demonstrated GHRM has a negative or no influence. For instance, Guerci et al. [74] proved that GRS was not significantly related to environmental performance, Ogebeibu et al. [90] found negative relationships between green performance with GRM and green team creativity, Rehman et al. [109] found GHRM had no relationship with environmental performance.

Mediators and moderators were often introduced as the intervening mechanisms to expand the understanding of GHRM research. Among the reviewed articles, 67.38% of them (n = 95) used single-level mediator(s)/moderator(s), 17.02% of them (n = 24) had not included mediator(s)/moderator(s), and the rest (n = 22, 15.60%) had used mix-level mediator(s)/moderator(s). Organization-level constructs seem more favored by researchers (n = 55) than employee-level ones (n = 40). Employees' attributes like perceived green support [85,89,110], environmental knowledge [111–113], personal green values [35,114,115], organizational circumstances such as green culture [81,116,117], leadership styles and emphasis [118–120], and proactive environmental management maturity [121,122] were all proved to have impacts on the relationship between GHRM and its antecedents or outcomes.

The antecedent of GHRM is the construct relatively discussed less in the framework (n = 46, 32.62%), aiming to more clearly identify the contexts and attributes that direct the organizations' perspectives and actions toward "Green" [43]. The organizational resources and capabilities, the firm's culture and green commitment, and the corporate social responsibility were discussed as the organization-level antecedents (e.g., [12,36,69,118]), while leadership types, top management commitment and support, and environmental management and practices were antecedents found at the organization's management-level (e.g., [123–125]). For the employee-level antecedents, employee green motivation and values were found (e.g., [37,68]). Moreover, stakeholders' pressure and barriers to GHRM implementation were also reckoned as "external" antecedents (e.g., [74,86,126]). Figure 12 below shows the analytical framework of GHRM research collecting items from previous empirical works.



**Figure 12.** The analytical framework of GHRM research.

### 3.4. Recommendation for Practitioners and Researchers

The results of this review show the increasing importance and great potential of GHRM development, both in the working field and academic area. Based on the empirical evidence from previous studies, recommendations are provided for both scholars and practitioners on three broad aspects.

#### 3.4.1. Context and Trend of GHRM

The GHRM explorations were largely conducted in Asia and within the service and manufacturing sector; however, most researchers did not mention the industry or segment in detail for the secondary sector. Therefore, it seems promising to conduct research across a wider variety of geographic contexts and investigate the first sector or specific industries or certain types of organizations that are under the green revolution or call for the urgent

need to go green [17]. Scholars could also apply the same framework in unexplored contexts or conduct cross-nation, cross-industry comparative studies. When beginning new GHRM research, it is recommended to refer to the identified streams for finding materials and generating ideas from reviewing the latest keywords. While business executives are recommended to adapt and integrate such insights into their daily management practices in accordance with their organizational context and green goals. It is also worth keeping an eye on the trends shown in the latest research and industrial frontiers. Such approaches would facilitate the customization of these strategies to suit their specific organizational context, thus enhancing their overall effectiveness.

#### 3.4.2. Access and Approach to GHRM

Most research investigated GHRM at a single level (organization or employee level), considered GHRM as a “bundled practice”, used quantitative approach methods, relying on a single source and cross-sectional data, which could result in poor generalization [127] and potential CMV [111,115]. Future studies are encouraged to apply different research methods or mix-method approaches and collect data from multiple sources, at multiple levels, and at multiple times to gain profound insights into GHRM. Managers should also treat GHRM as long-term and circular practices, constantly do internal surveys or interviews to observe the GHRM effectiveness and suitability for their organizations, and adjust accordingly, since it may take time for HRM practices to exert influence on both employees and the organization [35].

#### 3.4.3. Mechanism and Innovation in GHRM

It is rewarding to understand the mechanism of GHRM and consider it from different angles for both practitioners and researchers. Scholars can identify research gaps and make new contributions, while organizational leaders could implement GHRM to create competitive advantages.

Great opportunities appear in GHRM study and researchers are recommended to take the following steps: (1) work on GHRM practices that have been less discussed, like GIE, green teamwork, green health and safety management, and conduct comparative studies among GHRM practices; (2) develop a generalizable measurement scale or validate current measures under different contexts; (3) group theories or explore new theories to create and test different variable combinations; (4) relate sound theory basis to research framework, such as when looking for rational for employee level variables, one can add keywords like SET, SIT, and AMO to searches; (5) consider multi-level research design and analysis within the GHRM framework, and decode it from both organizational strategy and employee interpretations [27]; (6) conduct cross-discipline study by integrating other green management areas, such as green supply chain management; and (7) test new ideas in the GHRM domain under a green-related context like green energy or production industries.

Organizations are recommended to utilize the fruitful research results of GHRM, for example, designing suitable GHRM policies and practices according to their green requirement, using available scales to monitor employee and collective behaviors, and so on.

## 4. Conclusions

### 4.1. Summary of the Research

Actions toward environmental issues must admit no delay, and GHRM must become a field that allows managers and management scholars to explore opportunities and make changes. This systematic review analyzes the data of GHRM research following the PRISMA protocol, collecting details of 141 empirical publications from Scopus and WOSCC databases, thereby providing an objective and comprehensive overview of this topic with some original findings and suggestions (summarized in Table 2).



**Table 2.** Summary of the evidence and new findings.

RQs	Evidence from GHRM Literature	New Findings of GHRM
RQ1. What is the status quo of empirical GHRM research?	<ol style="list-style-type: none"> <li>1. Significant growth varies in research disciplines;</li> <li>2. Conducted context: mainly in Asia, developing economies, and the service and manufacturing sectors;</li> <li>3. Research clusters: theory implementing and framework extension, linking with employees, linking with an organization;</li> <li>4. Keyword trends: pro-environmental behavior, green creativity, and competitive advantage appeared in recent studies.</li> </ol>	<ol style="list-style-type: none"> <li>1. Attention from not only HRM but also across disciplines;</li> <li>2. Lack of evidence in the primary sector; lack of industrial description for the manufacturing sector;</li> <li>3. Three main research streams;</li> <li>4. Recent interests are employee-related issues.</li> </ol>
RQ2. How has GHRM been conceptualized, and how have theories been in empirical research?	<ol style="list-style-type: none"> <li>1. GHRM dimensions: most studies adopted bundled GHRMPs, and GT is among the most examined GHRMP aspect; bundled GHRMPs and GT were found positively relates to desired outcomes in most cases;</li> <li>2. Theory application: around half of the studies were based on a single theory; AMO theory was used most, followed by RBV, SET, and SIT; some recent studies used multiple theories.</li> </ol>	<ol style="list-style-type: none"> <li>1. Preference showed in bundled GHRMPs and GT, which show a high possibility of having positive effects; comparisons between GHRMPs were rarely made;</li> <li>2. Tendency of using multiple theories and conducting research from different perspectives.</li> </ol>
RQ3. What suggestions can be offered for future GHRM development based on the evidence?	<ol style="list-style-type: none"> <li>1. Research that adopted the same measurement scales for GHRM constructs show similar choices in the design of GHRM dimensions;</li> <li>2. Research that applied the same theories had similar inclinations of construct levels (organizational vs. employee level).</li> </ol>	<ol style="list-style-type: none"> <li>1. Selection of GHRM dimensions influences the choice of measurement scales;</li> <li>2. Theory applications interrelated with constructs choice and framework design.</li> </ol>

Increasing interest has been found for GHRM, and a boom of publications began in 2018 and has grown up to now. GHRM has drawn attention from both HR specialists and scholars and publishers across disciplines, and most studies were conducted in Asian countries and within service and manufacturing sectors through quantitative approaches. Currently, GHRM research lack of evidence in the primary raw materials sector and industrial description for the manufacturing sector. Risen from exploring how HRM can contribute to organizational environment management, the research of GHRM has been wildly spread, moving toward a broader frame covering both organizational and employee level constructs, HRM and other managerial systems, and environmental and non-environmental issues. The analysis of GHRM dimensions and measurements confirmed that the choice of GHRM practice usually depends on the measuring scale adopted, and green training and bundled GHRM practices have a higher possibility of positive results and are more favored by researchers. On the other hand, the framework design of GHRM research is closely related to its theoretical bases. The tendency to use multiple theories and to conduct research from a multi-level perspective was also revealed.

#### 4.2. Contribution of the Research

This review contributes to the field of GHRM in several ways. First, this systematic review of empirical GHRM literature provides practitioners and scholars with important knowledge of developing situations and confirmed relationships in this field [55]. Second, current research has synthesized scholarly inquiry over GHRM, and the results reveal the publication characteristics, foci and trends, conceptualizations, theoretical foundations, and research framework of GHRM, which addressed the RQ1 and RQ2. Third, the exploration of empirical results bridges the gap between theory and practice, thereby offering evidence-based suggestions on GHRM implementation for organizations and reliable research information for scholars. For those new to the GHRM field or still uncertain about stepping in, this study has provided an informative introduction with evidence-based

statistics. Fourth, through categorizing, comparing, and calculating ratios of collected data from different angles, some new findings are provided, such as a lack of research in certain contexts, that the selection of GHRMP influences the choice of measurement scales, and that the theory application is interrelated with choice of constructs and framework design. Based on these results, the author can outline the research pattern and identify the gaps, which further points out possible areas for future academical exploring and reliable information for managerial decision-making, answering RQ3.

#### 4.3. Limitations and Proposed Solutions

Despite the contributions of this study, several limitations are also noteworthy since they can point out the direction for future literature reviews. Although the author adopted the PRISMA approach and tried to have a comprehensive scope of the documents, the main limitation of this study turns out to be the searching and screening criteria, such as having a limited database, form, subject area, and language of empirical studies, which might exclude some important information on GHRM research. It is recommended that future research covers a more comprehensive range of resources to capture the empirical results, like adding “environmental sciences” into the search filter, including both conceptual and empirical research, and doing citation searching [54].

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