

GREEN HRM AND FINANCIAL PERFORMANCE: A BIBLIOMETRIC ANALYSIS

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Abstract: *The aim of this paper is to highlight, through the means of a bibliometric analysis, the ways in which the topic of green human resource management and its impact on the financial performance of firms has been tackled by the academic community. As such, the primary objective is to identify the main academic contributors, the most relevant keywords and their co-occurrence, as well as what are the most important contributions in terms of articles published. Furthermore, this paper also examines both the emerging and the declining themes of research conducted on GHRM and its relation to financial performance. Lastly, the insights gained by analyzing the literature are meant to serve as the basis for further in-depth academic inquiries.*

Keywords: *bibliometric analysis, green human resource management, financial performance, sustainability, corporate social responsibility*

JEL Classification: O15, L25

Introduction

Human resource management, as a field of study, has been constantly evolving and adapting to the ever volatile and increasingly complex demands of the labour market. Consequently, certain trends such as digitalization, the Covid-19 pandemic and the implementation of artificial intelligence have steered academic discourse in such particular directions. One other relevant example is the mounting pressure for organizations to adopt a more responsible and sustainable approach, both towards the environment, but also in regards to their modus operandi as a whole, hence the appearance of sustainability as a main concern in various fields of activity. Human resource management is no exception, with the introduction of the term Green HRM, meant to represent a new and innovative outlook on the role of HRM that transcends the now accustomed to corporate social responsibility. While not an entirely new term, green human resource management (GHRM) has been gaining traction, with an increasing number of articles published on the topic. As such, the purpose of this paper is to examine this trend in academic writing by means of a bibliometric analysis in order to highlight the current understanding of GHRM, but most importantly its relation to the financial performance of an organization.

Literature review

Contrary to popular belief, the implementation of environmental policies is not mutually exclusive with an organization's financial performance and overall competitiveness. In order to clear this misunderstanding, for the sake of this paper we first explain the term of GHRM as it is currently understood and then we highlight the findings of some of the most relevant and highly cited literature. In essence, green HRM focuses on acquiring, developing, and sustaining environmentally conscious employee behaviors (Renwick et al., 2013). It integrates ecological management goals into HR processes like recruitment, training, and performance management (Muller-Carmem et al., 2010). According to the literature review conducted by Renwick et al., 2013, during the first few years that

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GHRM started to gain traction in the academic community, the best way to understand this topic is by exploring the basic functions of human resource management and the various applications of sustainable practices within the field.

Furthermore, the study highlights that, at least at the time, organizations were lagging behind in fully implementing the practices that GHRM represents. However, despite being written at an early stage of development, the paper and its authors already managed to identify a potential link between green human resource management and the financial performance of an organization, as Renwick et al. (2013) point out that “there is some evidence that better environmental performance is also associated with improved financial performance outcomes”.

Given that lately the relationship between green human resource management (GHRM) and financial performance has been extensively explored in the literature, we conducted a focused systematic review of the most highly cited studies, drawing on refined search results from the Web of Science database using both keywords as our primary search terms. A more detailed explanation of the analysis methodology will be further outlined in its own chapter within this paper. Therefore, in this section, we will examine the most highly cited papers in the field according to the Web of Science Database and develop a systematic review of the most influential contributions. This includes an analysis of their authorship, central themes, research methodologies, and key findings. All of these data are summarized in the table below (table no.1). Two of the nine articles were found to be not aligned with the focus of our study and have therefore been excluded from this analysis. The reviewed articles were published over the timeframe 2019-2023.

Table 1.

Systemic analysis of the highly cited papers

Article	Authors	Year	Main Theme	Methods & Key Findings
Embracement of industry 4.0 and sustainable supply chain practices under the shadow of practice-based view theory: Ensuring environmental sustainability in corporate sector. <i>Journal of Cleaner Production</i> , 398, 136609.	Khan, S. A. R., Tabish, M., & Zhang, Y.	2023	Impact of Industry 4.0 on triple bottom line performance	Smart-PLS, SEM; SSCP mediates and enhances environmental, social, and economic performance.
Corporate Social Responsibility and Performance in the Hotel Industry. The Mediating Role of Green Human Resource Management and Environmental Outcomes	Úbeda-García, M., Claver-Cortés, E., Marco-Lajara, B., & Zaragoza-Sáez, P.	2021	CSR, GHRM, and hotel performance	variance-based structural equation modeling (PLS-SEM); CSR positively affects performance; GHRM and environmental outcomes mediate the results.

Evaluating green innovation and performance of financial development: mediating concerns of environmental regulation.	Hsu, C. C., Quang-Thanh, N., Chien, F., Li, L., & Mohsin, M	2021	Green innovation, financial development, environmental regulation in China	OLS; Green innovation boosts financial development and reduces emissions.
A structural model of the impact of green intellectual capital on sustainable performance	Yusliza, M. Y., Yong, J. Y., Tanveer, M. I., Ramayah, T., Faedah, J. N., & Muhammad, Z.	2020	Green intellectual capital (GIC) & company performance	Structural equation modeling (SEM); GIC improves economic, social, and environmental performance.
Green innovation and environmental performance: The role of green transformational leadership and green human resource management	Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D.	2020	Green leadership, GHRM, green innovation	SEM; GHRM mediates the effect of leadership on innovation and environmental performance.
Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behavior in hotels? A mixed-methods study.	Pham, N. T., Tučková, Z., & Jabbour, C. J. C.	2019	GHRM → organizational citizenship behavior for the environment (OCBE) in the hospitality industry	Mixed-methods; GHRM increases OCBE; green training is the strongest predictor
Nexus between green intellectual capital and green human resource management.	Yong, J. Y., Yusliza, M. Y., Ramayah, T., & Fawehinmi, O.	2019	Green intellectual capital → GHRM	Partial Least Squares Regression Analysis (PLS); Human and relational capital influence GHRM.

Yusliza et al. (2020) examine the role of green intellectual capital in enhancing sustainable performance within manufacturing firms, using survey data from 112 Malaysian manufacturing companies. They found that green intellectual capital positively impacts economic, environmental, and social outcomes and their research emphasizes that green intellectual capital is a valuable intangible resource that can provide a competitive advantage and help firms improve cleaner production practices (Yusliza et al., 2020).

Other authors, such as Úbeda-García et al, 2021, analyzed the relationship between CSR and firm performance, examining both the direct effect and the potential mediating roles of variables such

as GHRM and environmental outcomes. They emphasize that CSR significantly boosts hotel performance, with its effects strengthened when supported by Green Human Resource Management and improved environmental outcomes. Their study shows that integrating CSR with GHRM practices helps hotels enhance competitiveness and sustainability (Úbeda-García et al, 2021).

Hsu et al. (2021) emphasize the crucial role of human resources in promoting green technology and economic growth. The study examines the relationship between green innovation performance and financial development in China, highlighting how environmental regulation mediates this link across 28 provinces from 2000 to 2018. Strong human capital, combined with environmental regulations, enhances technical progress, while education and public awareness significantly improve environmental quality, indicating that policymakers should invest in skills and education for long-term environmental benefits. Their findings show that green financing restricts short-term lending, helping prevent overinvestment in clean energy, whereas long-term loans have minimal effect on renewable energy overinvestment, and the mediating effect is not sustained (Hsu et al., 2021).

On the other hand, the focus of other researchers has been to investigate the interplay between green transformational leadership, green human resource management, and their impact on green innovation and environmental performance in small and medium-sized enterprises (SMEs). Their findings show that green transformational leadership drives green HRM practices, which in turn enhance green innovation and improve environmental performance in UAE manufacturing SMEs. Leadership and HRM are key to building internal capabilities for sustainability, and investing in green practices can strengthen both innovation and environmental outcomes (Singh et al, 2020).

Pham et al. (2010) apply Ability-Motivation-Opportunity (AMO) theory in order to determine how green HRM (GHRM) practices influence organizational citizenship behavior for the environment (OCBE) in the hospitality sector. Using a mixed-methods approach—surveying 203 employees in 4–5 star hotels and conducting two qualitative case studies, they reveal that GHRM practices directly enhance OCBE, while the interaction of training, performance management, and employee involvement further boosts voluntary green behavior (Pham et al., 2010).

Yong et al. (2019) address in their study three dimensions of green intellectual capital—green human capital, green structural capital, and green relational capital. The authors examine the impact of the aforementioned dimensions on green HRM, by conducting a survey among 112 large manufacturing firms in Malaysia. They emphasize that the growing attention to environmental issues has prompted companies to adopt green practices, and that implementing green HRM is essential in order 'to develop a green organizational identity' (Yong, et al., 2019, p.372). Their findings revealed that green human capital and green relational capital positively affected green human resource management, whereas, unexpectedly, green structural capital was not significantly associated with it (Yong et al, 2019).

Lastly, Khan et al. (2023) examine how Industry 4.0 technologies encourage sustainable supply chain practices in the Chinese textile sector and how these practices affect environmental, social, and economic performance. Their findings show that digital technologies strongly support green purchasing, eco-design, and green marketing, which in turn improve environmental and social outcomes. These improvements eventually contribute to better economic performance. Overall, the authors conclude that Industry 4.0 serves as a catalyst for sustainability and strengthens long-term organizational performance (Khan et al., 2023).

Analysis methodology

The bibliometric analysis has been conducted utilizing R Studio and its accompanying “bibliometrix” and “biblioshiny” packages. These tools were chosen specifically for their accessibility and user-friendly interface, which ease the process of data modelling, plot creation as well as aid the presentation of the data in a visually appealing manner. In regards to the data itself, for the purpose of this paper we only made use of the Web of Science database, with the primary

searchwords being "green human resource management" and "financial performance". The resulting 402 documents were immediately filtered to include only Articles that were published in English, further reducing the dataset to 356 results. Lastly, in order to eliminate the entries that strayed too far from the field of business economics, a final filter was applied in terms of categories. We have limited the data to articles published in either of the following: management, business, environmental sciences, environmental studies, economics and business finance. Thus, the final dataset created with all the aforementioned filters contains a total of 259 articles at the moment of writing, 9 of which have been identified as highly cited papers. It is important to mention that this dataset does not include any time frame filters, as this would reduce the number of entries too drastically. This means that the articles included in the bibliometric analysis range from articles published in 2010 up until the most recent published in a January 2026 issue of *Habitat International*. The process of creating the final dataset can be observed below (fig. no.1).

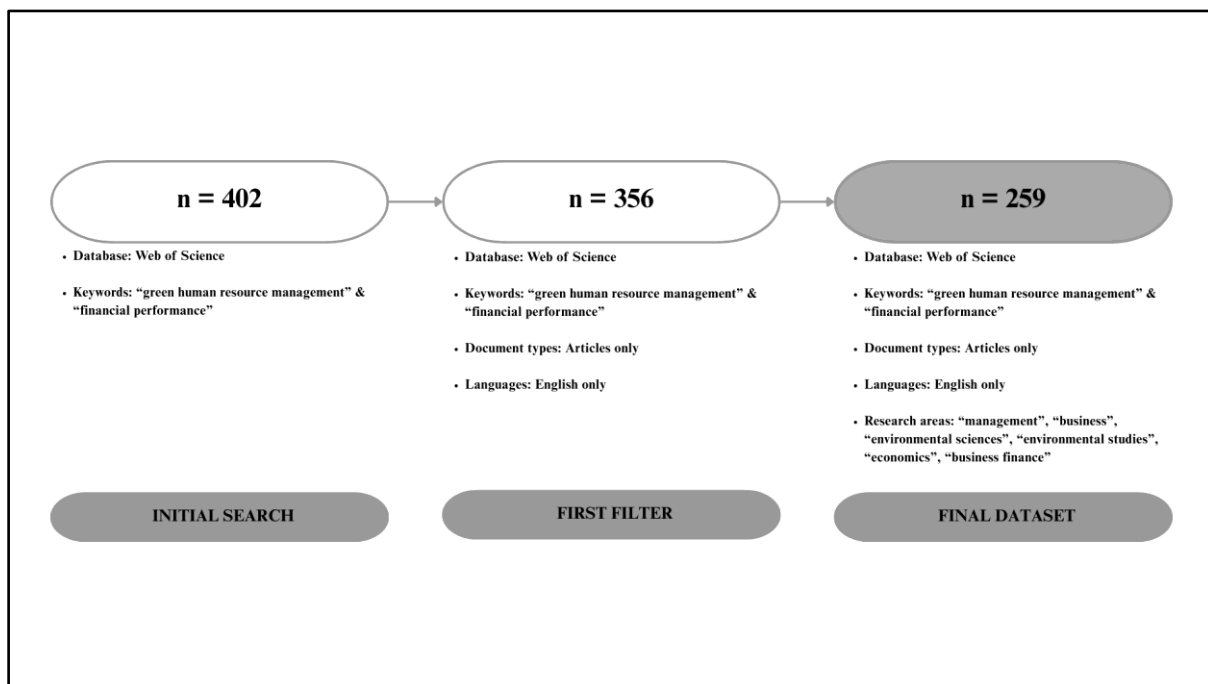


Figure 1. *Analysis methodology*

This final dataset was utilized for the bibliometric analysis with a clear set of objectives that were outlined as follows:

- O1 - Analyzing systematically and presenting the most highly cited papers and their findings regarding the relation between GHRM and financial performance;
- O2 - Determining the declining, emerging and niche research topics;
- O3 - Highlighting the main keywords and their co-occurrence in published research;
- O4 - Identifying the main academic contributors based on country of origin, keywords utilized as well as the primary international collaborations;
- O5 - Pinpointing potential gaps in knowledge as well as future research opportunities.

Results and discussion

Wordcloud

The most appropriate starting point for the results of the bibliometric analysis is a Wordcloud highlighting the most utilized keywords. The resulting wordcloud can be observed below (fig. no.2).

interlinked. The dataset supports this structure by showing that the highest frequencies lie within the blue and red clusters, whereas the green and purple clusters offer complementary insights into the overall research landscape. The thick connecting lines between the blue, red, and green clusters reflect strong interdependencies, emphasising that sustainable HR practices, innovation, and financial outcomes are not isolated themes but form an integrated research system.

As can be observed (fig. no.4), the first cluster, represented in red, is characterised primarily by the term “financial performance”, which is our research topic, followed by “environmental performance”, “behavior” and “competitive advantage”. Thus, the red cluster revolves around financial performance and environmental performance, representing the most influential outcome-related themes. These terms rank among the highest in frequency and impact, confirming their pivotal role in linking corporate sustainability strategies to measurable organizational outcomes.

The second cluster, shown in blue, is centered around our main research theme, namely “green human resource management”, indicating a strong conceptual concentration on sustainability-driven HR practices. Other keywords in this cluster that show high co-occurrence values are: “performance”, “sustainability”, “environmental management” and “supply chain management”, suggesting that GHRM serves as a key focus area, closely connected to core sustainability-oriented management practices.

The green cluster highlights “impact” and “innovation” as core nodes. Their strong connectivity implies the possibility that innovation acts as a mediating mechanism through which environmental and human resource initiatives translate into performance improvements. Other keywords that frequently co-occur within this cluster are “green” and “strategy”.

Finally, the purple cluster groups together keywords such as “HRM”, “mediating role” and “corporate social responsibility”. This appears to highlight an emerging thematic focus on the ethical and managerial dimensions of human resource practices within sustainable development.

International collaborations by country

As is the case with a large majority of fields of study, international collaborations happen on a regular basis and serve to enrich the current understanding of a topic by pooling the best efforts of multiple researchers from different cultural and academic backgrounds. Being part of a strong international network of collaborating authors cannot be underestimated and it is often the case that the most valuable and highly cited papers are the work of multiple gifted individuals from across the globe. This is the case for many of the papers previously analyzed in our literature review and the bibliometric analysis highlights these collaborations, as can be observed (fig. no.5).

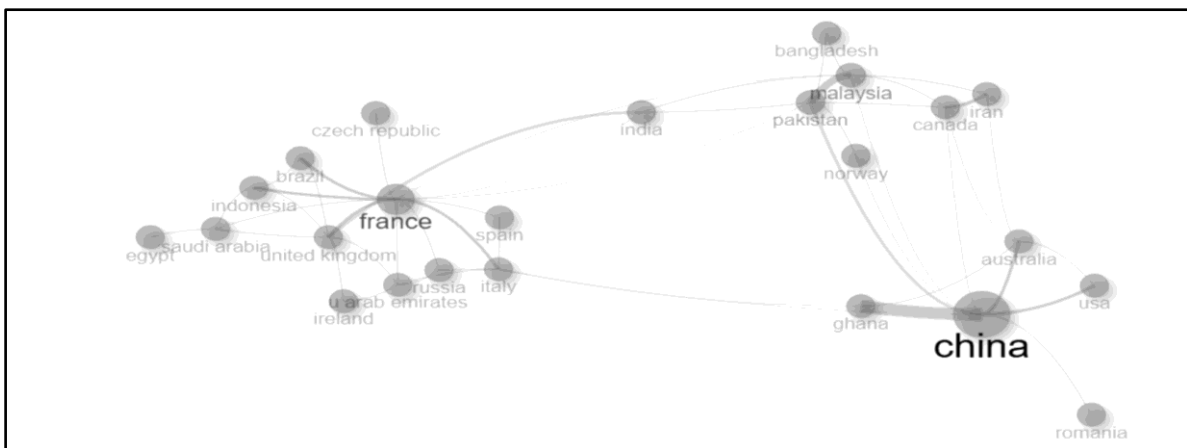


Figure 5. *International collaborations*

Three primary collaboration clusters are identified with China, France and Malaysia being the epicenters of each of their respective clusters. Prior to this analysis, it was anticipated that most international collaborations would be based on geographical considerations, with Europe being the largest cluster given the environmental policies of the European Union. However, despite the green cluster being the most diverse in terms of countries and collaborations, the most intense academic partnerships are between authors from China and Ghana.

Main academic contributors

Lastly, we created a three field plot as an overall brief summary of the bibliometric analysis, but also to highlight the main academic contributors. The three field plot was created with the country of origin on the left side, the primary authors in the centre and the primarily utilized keyword on the right. The three field plot can be observed in the figure below (fig. no.6). China distinguishes itself as the main academic contributor in terms of papers published regarding GHRM and financial performance, followed by Malaysia, Ghana, France and Pakistan. In terms of authors, the most prolific author is Ramayah T. from, while China has a larger number of authors with fewer articles published, the most important authors being W. Hu, Y. Jiang and G. Tang.

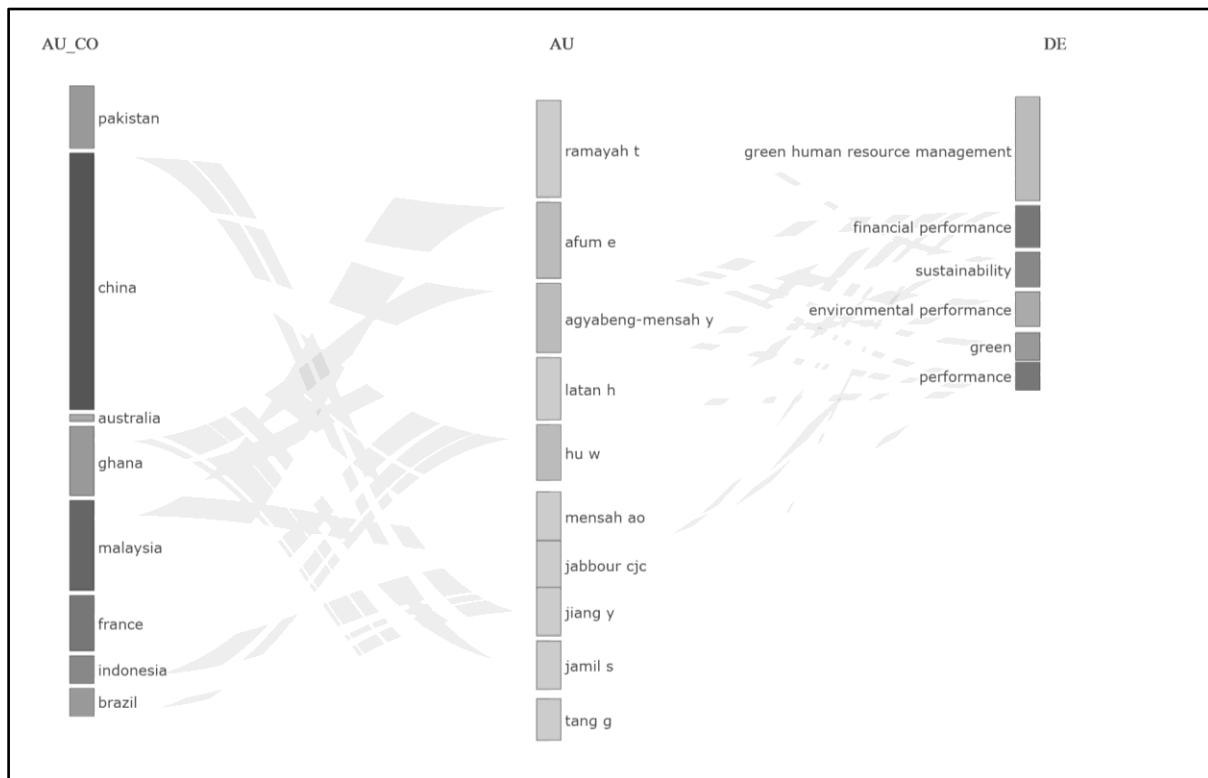


Figure 6. *Three field plot*

Conclusions and future directions

Green human resource management has been a topic of interest for several years now, with a significant increase in articles published from 2017 to 2021 (Akhtar et al., 2023). The existing literature that has been reviewed for the sake of our bibliometric analysis focused on a more narrow approach by detailing the link between the general concept of GHRM and the financial performance of companies. This article has systematically analyzed the most highly cited papers containing the aforementioned keywords and has highlighted that regardless of the applied research method, there is a clear relation between GHRM and financial outcomes. Potential increases in competitiveness,

sustainability, quality of human capital and improved organizational citizenship behavior for the environment are only some of the identified advantages.

Furthermore, we have identified “environmental management” and “strategy” as some of the emerging themes in this field of study, which suggests a more strategic approach and a potential proliferation of GHRM practices among organizations, while keywords such as “innovation” and “supply chain management” are currently the motor themes, with the latter being the subject of some of the most highly cited papers in the field. We have also managed to highlight the co-occurrences of keywords, with “environmental performance”, “innovation”, “behavior”, “competitive advantage” as the cores of research regarding GHRM and financial performance. In regards to our fourth objective, authors from China have been identified as the primary academic contributors in terms of number of articles published, while also having a particularly strong collaboration with authors from Ghana. Other important academic contributors based on country are Malaysia, Pakistan and last, but not least France which boasts the most varied international collaboration network.

As is the case with any scientific paper, it is important to also consider the limitations. The first such limitation is the use of a singular database, that being Web of Science. Furthermore, due to the somewhat novel and also niche nature of this particular field of study, the number of entries can be considered rather small for the sake of a bibliometric analysis.

Potential future research directions can focus on a more broad analysis of green human resource management and its relation to financial performance by including other databases and by utilizing fewer research filters in order to obtain a larger set of data. Alternatively, future research could also focus on a more narrow approach by analyzing the mediating roles of leadership and employee motivation on the financial performance of organizations through the implementation of GHRM practices.

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