

A bibliometric analysis – Green human resource management on green employee behavior



Mahsa Amaliasita^a | Meika Kurnia Puji Rahayu^b | Nuryakin^b

^aMagister Management, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia.

^bManagement Department, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia.

Abstract An analysis of the development of green human resource management and employee green behavior research publications was carried out between 2016 and 2023. Hence, this study aims to classify concepts or themes related to green human resource management and employee green behavior through descriptive analysis. A total of 224 articles indexed in Scopus were subjected to analysis using VOS viewer software, serving as a crucial tool in the visualization of the bibliometric network. This process involved the application of keyword filtering techniques. The analysis revealed that the 224 articles contain numerous concepts that could be categorized into eight clusters. The significance of this study lies in the discovery of a study concept for green human resource management and employee green behavior that will aid in the development of a conceptual framework for future research. The reviewed articles were only obtained from the Scopus database. Therefore, future research must use a comparative analysis approach as a different analytical strategy involving other databases such as Web of Sciences.

Keywords: green human resource management, employee green behavior, VOS viewer, bibliometric analysis, Scopus

1. Introduction

The global challenge of environmental degradation conditions over the last few decades has become a global crisis that requires attention in a variety of countries throughout the world. Several previous studies (Ahmad et al., 2021; Islam et al., 2021) have demonstrated that human activities in organizations frequently contribute directly to environmental degradation and climate change. These phenomena are due to the prevalence of human activities within the organization, which directly impact the environment and double carbon emissions into the atmosphere. This global challenge event has increased the demand for organizations to be accountable for responding to the negative consequences of their activity (Ahmad et al., 2022). The roles and functions of human resource management (HRM) in managing the difficulties described above are critical and require attention (Pham et al., 2020).

Human resource management is fundamental to successfully implementing organizational policies and strategies (Acquah et al., 2021), especially in developing sustainable strategies involving individuals as part of green initiatives. The "green" initiative behavior carried out by individuals in the organization is an extra behavior shown by employees toward the environment to realize environmental sustainability initiatives (Ying et al., 2020). This type of behavior is regarded as a crucial instrument to increase environmental performance and organizational sustainability, and it can potentially provide organizations with a competitive advantage (Karmoker et al., 2021).

Employee "green" behavior refers to an employee's contribution to preserving the environment and reducing environmental harm, such as water conservation activities, efficient resource utilization, energy savings, and recycling. Based on previous research, "green" behavior can be divided into two categories: extrarole behavior and in-role or task-green behavior. (Fawehinmi et al., 2020). In-role green behavior refers to environmentally friendly actions performed within the primary responsibilities outlined in the job description and is considered essential for evaluating employee performance. On the other hand, extrarole green behavior entails voluntary engagement in "green" practices that go beyond the established organizational expectations (Aboramadan, 2022; Chaudhary, 2020). Therefore, organizations must consider what factors can encourage "green" behavior. Several previous studies have examined anything that can increase or promote "green" behavior, one of which is green human resource management (Saeed et al., 2019; Zhang et al., 2019).

Green human resource management is a term in human resource management that emphasizes pro-environmental activities and has garnered considerable scholarly attention. "Green" practices in implementing human resource management functions help increase individual awareness toward effective and sustainable environmental management (Zhang et al., 2019). Green human resources refer to organizational practices and strategies that are used to encourage employees' behaviors in an environmentally responsible manner and to promote environmental sustainability in the workplace to increase the use of sustainable resources and reduce environmental damage caused by business activities. Research on green human resource management has grown exponentially since 2016 (Yong et al., 2020). Through the



concept of "sustainability," green human resource management has become increasingly important in the public and private sectors in recent years (Khan & Faisal, 2023). The increased academic research on green human resource management indicates a need to synthesize findings and identify the latest trends in green human resource management, especially regarding its relationship to "green" behavior.

This study used a bibliometric methodology to examine the evolution of green human resource management and green behavior research from 2016 to 2023. The analysis focused on various indicators, including the number of publications, the number of references used, the number of authors involved, and the authors' affiliations and institutions supporting the development of research topics by examining keyword cooccurrence. This research topic is intriguing due to the importance of green human resources management in a sustainability-oriented organization, considering the role of green human resource management as a driving factor in encouraging "green" behavior or environmentally friendly behavior in organizations, which can provide direct benefits for organizational sustainability.

2. Materials and Methods

This review uses bibliometric analysis methods to analyze and evaluate conditions related to publication trends regarding green human resource management and green behavior. Bibliometrics is a statistical approach that may quantitatively analyze research publications about one specific topic in mathematical ways (Yu et al., 2020). This study can help provide a solid framework for advancing specific scientific fields, allowing new researchers or academics to learn about the most recent developments while gaining a comprehensive view of a topic (1) Gain an exhaustive overview (2) uncover knowledge gaps (3) generate unique research ideas (4) Position their intended contributions to the field of study (Donthu et al., 2021)

2.1. Data Collection and Search Strategy

Scopus, Elsevier's abstract and citation database, was chosen since it contains the most comprehensive peer-reviewed research on the topic under review (Anglada-Tort & Sanfilippo, 2019). Data screening was carried out from 2016 to 2023 using titles, abstracts and keywords for green human resource management: green employee behavior as an identification step. Further limitations were the language in the article and the type of document used by researchers to filter the articles to produce a total of 224 articles. The VOS-viewer software is an analytical tool to manage a collection of articles downloaded in RIS format. Its primary function is to extract cluster data and generate network visualizations of the research themes. The process of reviewing articles involves the examination of data through analysis and conceptualization. Data analysis and conceptualization is a phase in review articles focusing on cluster analysis, dominant topics discussed, thematic correlation and mapping of thematic study that can answer research questions.

3. Review of Results and Discussion

3.1. Year of Publication

The topic of the study on green human resource management and green employee behavior indexed Scopus shows its development from 2016 to 2023 as seen in Figure 1 and Table 1.

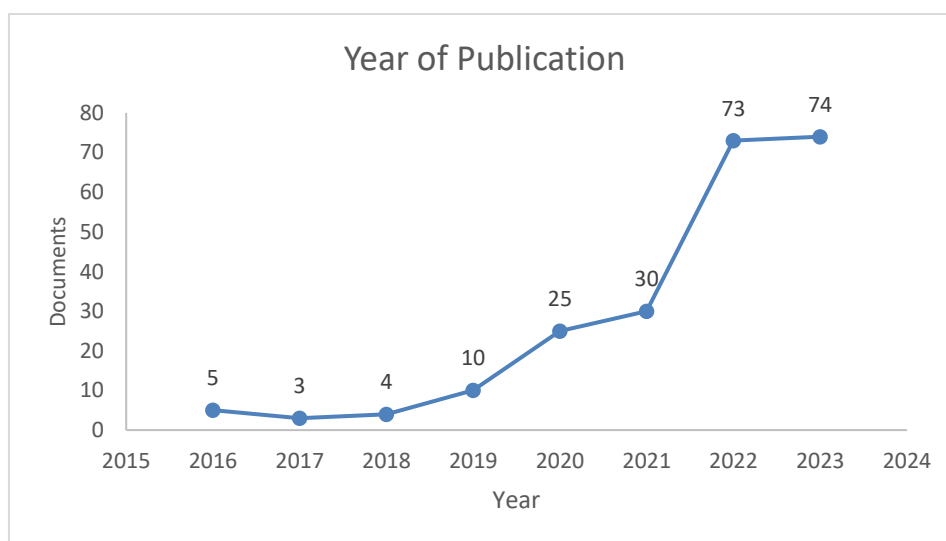


Figure 1 Publication Chart From 2016 to 2023.

Source: Scopus Database.

Table 1 Publications by Year.

Years	Number of Publications
2023	74
2022	73
2021	30
2020	25
2019	10
2018	4
2017	3
2016	5

Source: Scopus Database.

Moreover, this class totals 224 green human resource management; green behavior in Figure 1 shows that publications on related themes tend to increase in the 2016 to 2023 timeframe. Although in 2017 there was a decline in publications related to research topics with a total of three articles, the lowest number in eight years, the following years showed an increase to the highest number of publications in 2023 with a total of 74 publications.

3.2. Publications by Sources

Figure 2 shows the top ten source details of the most published journal articles related to research topics of 224 publications. Details of the publisher's journal sources and overall number of publications are shown in Table 2.

Table 2 Publications by Source.

Sources	Number of Publications
Sustainability Switzerland	24
Journal of Cleaner Production	18
Corporate Social Responsibility and Environmental Management	10
International Journal of Manpower	10
Business Strategy and The Environment	7
Frontiers In Psychology	7
Environmental Science and Pollution Research	6
Frontiers in Environmental Science	5
International Journal of Contemporary Hospitality Management	5
International Journal of Hospitality Management	5

Source: Scopus Database.



Figure 2 Documents per year by source.

Source: Scopus Database.

From the search results, there were 224 journals from Scopus that published green human resource management and green behavior research articles. Table 2 shows more clearly the top ten sources of journals that mainly publish research-related articles related to ongoing research. Sustainability Switzerland is the journal with the most publications among



several other journal sources with a total of 24 published articles. The Journal of Cleaner Production has the second-largest number of publications with a total of 18 articles published. Corporate Social Responsibility & Environmental Management and International Journal of Manpower in third and fourth place with ten articles each.

Business Strategy and The Environment & Frontiers in Psychology, each with seven articles publications. Environmental Science and Pollution Research has six article publications, then Frontiers in Environmental Science, International Journal of Contemporary Hospitality Management, International Journal of Hospitality Management have the lowest number of publications with each five article publications.

3.3. Publications by Country

Table 3 and Figure 3 above show the top ten countries that contribute the most publications related to research topics. China was the leading publisher of research-related articles with a total of 67 articles, Pakistan obtained the second position with 60 articles, while Malaysia followed closely with 33 articles, India with 22 articles, the United States with 19 articles, Australia with 17 articles, the United Kingdom with 16 articles, Turkey with 13 articles, and Saudi Arabia and the Czech Republic with 12 and 10 articles, respectively.

Table 3 Publications by country.

Country	Document
China	67
Pakistan	60
Malaysia	33
India	22
United States	19
Australia	17
United Kingdom	16
Turkey	13
Saudi Arabia	12
Czech Republic	10

Source: Scopus database.

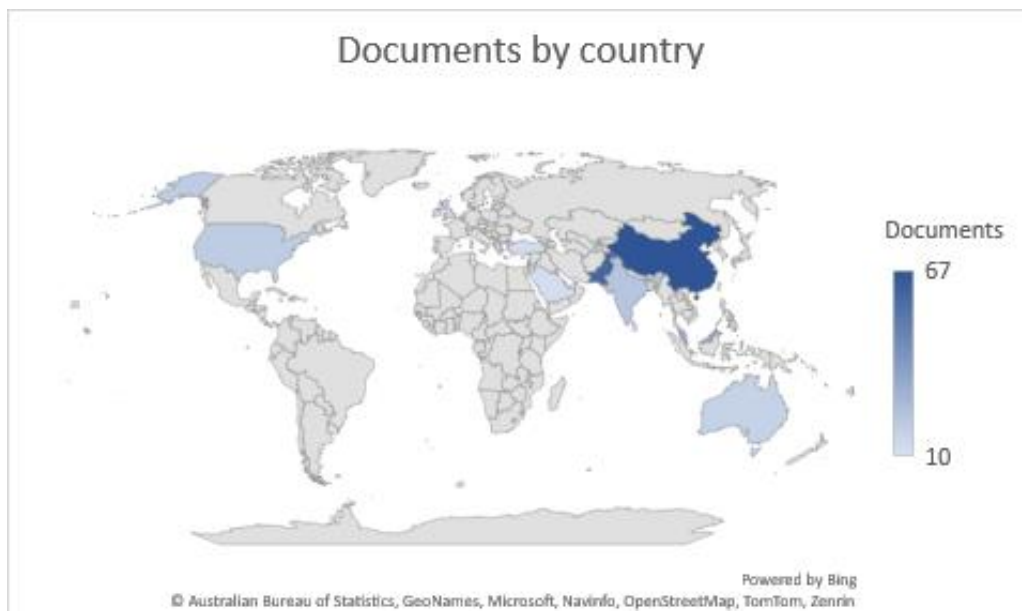


Figure 3 Publications by Country.

Source: Scopus Database.

3.4. Publications by Affiliation

According to the research, the ten affiliates that published the most “green human resource management” research articles on Scopus during 2016 and 2020 were The Superior University, Lahore with thirteen articles. Afterward, Univerzita Tomáše Bati ve Zlin and Universiti Malaysia Terengganu occupy the second and third positions, respectively, with eight articles each. The fourth and fifth positions are Universiti Sains Malaysia and Iqra University with a total of six publications. More details of the list of ten affiliates are further shown in the figure 4 and Table 4 below:

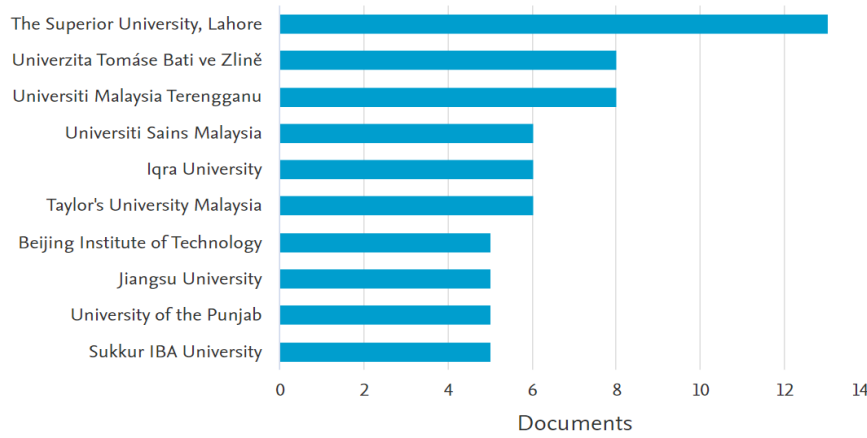


Figure 4 Publications by Affiliation.
 Source: Scopus Database.

Table 4 Publications by Affiliation.

Affiliation	Document
The Superior University, Lahore	13
Univerzita Tomáše Bati ve Zlině	8
Universiti Malaysia Terengganu	8
Universiti Sains Malaysia	6
Iqra University	6
Taylor's University Malaysia	6
Beijing Institute of Technology	5
Jiangsu University	5
University of the Punjab	5
Sukkur IBA University	5

Source: Scopus Database.

3.5. Publication by Type

Figure 5 below illustrates the percentage of document types from 224 documents that were obtained through the Scopus database between 2016 and 2023 regarding related topics. Articles make up 97.8 percent of all document classifications, while reviews account for 2.2 percent.

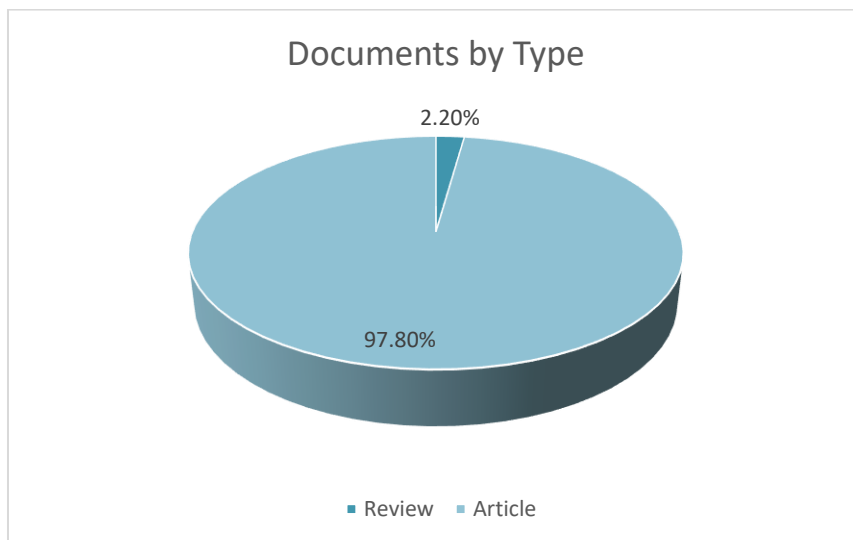


Figure 5 Publications by Type.
 Source: Scopus Database.

3.6. Linkage and Clustering of Themes

The clustering of themes provides a comprehensive visual representation of interconnected and relevant concepts to the study topic issue. A total of 112 items were identified through 224 articles indexed by Scopus. Furthermore, analysis with



VOSviewer showed eight concept groups, as shown in Figure 6 and Figure 7. The concepts displayed are obtained from the cluster density and each color code represents a list of cluster-specific concepts that stand out from each cluster. Clustering uses color as a coding mechanism that marks each (8 clusters) differently to improve understanding of the different concepts in each cluster. This approach aims to ensure the identification of themes often discussed in previous research. It also enables new scholars who want to begin researching green human resource management to identify exciting new topics.

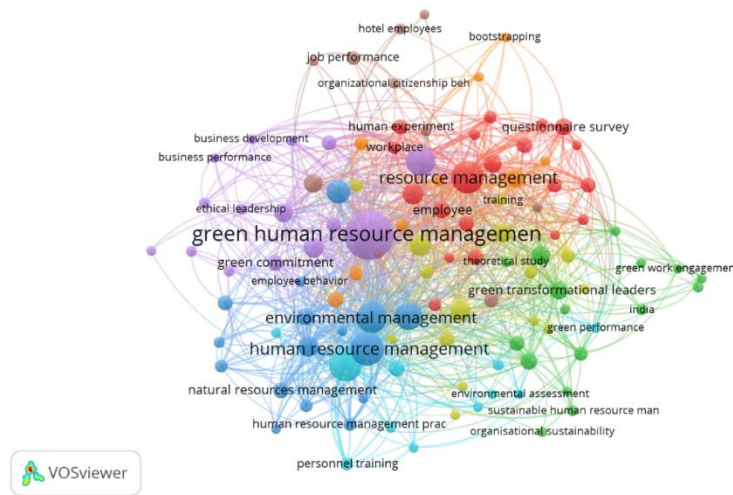


Figure 6 Relation of Theme.

Source: Processed Using VoS Viewer.

For example, related concepts in Cluster 1 are explained such as employee, green employee behavior, environmental protection, green culture, green human resource practices, green innovation, manufacturing, responsible leadership and green supply chain management.

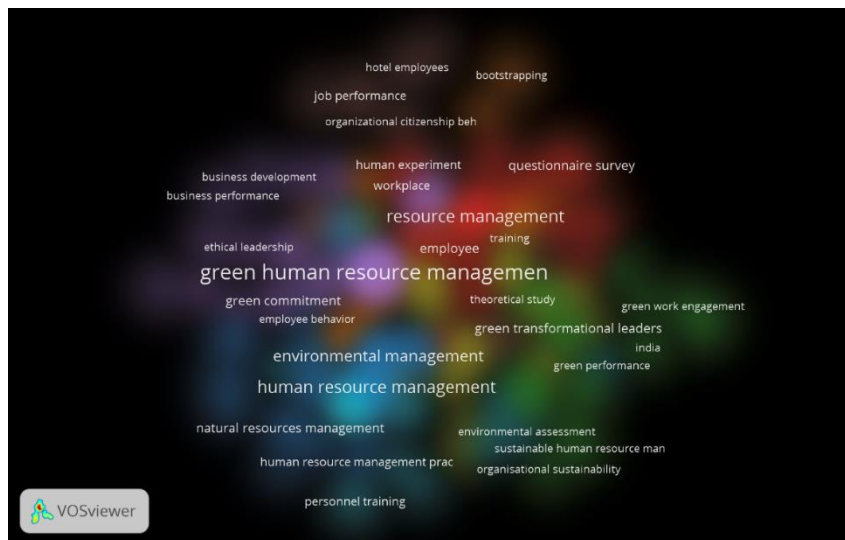


Figure 7 Cluster Density Visualization.

Source: Processed Using VoS Viewer.

Then, associated concepts in Cluster 2 include corporate social responsibility, extrarole green behavior, green human resource management, green work engagement, in-role green behavior, and sustainable human resource management. Furthermore, Cluster 3 focuses on employee behavior, pro-environmental behavior, individual green values, mediating roles, and natural resource management. In Cluster 4, the concepts are AMO (ability, motivation, opportunity) theory, environmental awareness, green organizational culture, green training, and management practices. Cluster 5 relates to concepts such as ethical behavior, psychology and green climate, green creativity, green knowledge sharing, and green commitment. Cluster 6 related to economic performance, green intellectual capital, job satisfaction, and performance. Cluster 7 focuses on green self-efficacy, green economy, bootstrapping, Malaysia, environmental consciousness and Turkey. The last cluster is Cluster 8, which is related to work engagement, sustainable performance, organizational citizenship behavior, green management and hotel employees.

related to Green Human Resource Management and Employee Green Behavior, as shown in Figure 8: environmental consciousness, environmental awareness, and voluntary proenvironmental behavior, which are still not widely discussed.

5. Limitation

Every study will likely have limitations. The limitation of this research is that the articles reviewed are only sourced from the Scopus database, so there are no data to compare. Meanwhile, there are various other databases, such as Web of Science (WOS), that can be used simultaneously using a comparative analysis approach so that the results obtained will look more attractive

Ethical considerations

Not applicable.

Conflict of Interest

There is no conflict of interest declared by authors.

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