



Review Article

# Explicating Sustainable HRM Literature through a lens: A Citation Analysis and Collaboration Network Visualization Approach

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**ABSTRACT:** The study explores the evolving landscape of sustainable HRM research through citation analysis and collaboration network visualization. The study retrieve data from 169 peer-reviewed articles in the “Scopus” and the “Web of Science”, and uses this data to identify key contributors, notable publications, and collaborative patterns in the field. Over the years, citation frequency appears to increase overall, especially from 2016 to 2020, which reflects an increasing interest in the sustainable HRM field. Leading authors such as “Agyemang, Collins Badu”, “Akbaş, Gülçin” and “Vanhala, Sinikka” are highlighted for their substantial impact and strong collaborative networks. The “Australia”, “United Kingdom”, “Poland”, “Sweden” emerged as major research hubs. “Sweden” is noted for its high average citations per document, indicating impactful contributions despite a smaller research volume. Prominent institutions like the “School of Business of Australian Catholic University at Sydney, Australia” and the “School of Business, Economics and Law of University of Gothenburg at Vasagatan 1, Gothenburg, Sweden” demonstrate significant influence and collaboration within the research community. The institutions, particularly from Australia, Sweden, Finland and the United Kingdom, are key players in Sustainable HRM research, as indicated by their high citation averages and collaborative efforts. The study highlights the value of interdisciplinary collaboration and offers a way forward by navigating this dynamic field of Sustainable HRM research. Further the study adopted cite context analysis a new methodology for analysing textual content in citations through an application scite.ai. The Scite.ai categorises citation contexts into supporting, contrasting, and mentioning types respectively. The study further evaluated the distribution of “Supporting”, “Contrasting”, and “Mentioning” citations within the five sections of academic articles such as “Introduction”, “Methods”, “Results”, “Discussion”, and “Other”.

**KEYWORDS:** Sustainable Human Resource Management, SHRM, Human Resource Management, HRM, Citation Analysis, Network Visualization, Collaboration Network, VOS viewer, Total Link Strength, Scite.ai, Citation Context analysis.

## INTRODUCTION

Citations are crucial in examining both the historical background and the innovative aspects of new research (Iqbal *et al.*, 2021) and serve as the primary quantifiable indicator of academic credit within the academic community (Fortunato *et al.*, 2018). With the advancement of technology and rapid growth, organizations are facing numerous environmental challenges that

compel them to focus on sustainability (Rubel *et al.*, 2021). Sustainable Human Resource Management (SHRM) is a comprehensive approach that prioritises the long-term well-being of both the organization and its employees. This approach assesses the three factors of HRM practices such as “social”, “economic” and “environmental” and strives to execute a balance among these three factors (Gollan & Roberts, 2017). A core aspect of SHRM involves creation of an equitable, inclusive and supportive workplace environment for the workforce and wider public (Sarkis & Sundaram, 2016). SHRM encompasses promoting inclusion and heterogeneity, as well as incorporating the policies to improve the employee and their families’ wellbeing (Brammer & Pavelin, 2016). The objective of SHRM is to oversee the human resources of an organisation in a responsible and ethical manner, ensuring its long-term sustainability (Jackson & Ruderman, 2013). SHRM practices encompass introducing environmentally friendly green measures, such as decreasing waste and carbon foot prints and promoting sustainable habits amongst employees (Sarkis & Sundaram, 2016).

Additionally, enhancement of employee engagement and well-being is essential. It can be achieved by providing opportunities for skill development and career advancement, promoting a healthy work-life balance, and offering programs for their wellbeing (Brammer & Pavelin, 2016). SHRM practices should be consistent with the strategic objectives of the organisation and become an integral part of the overall management system (Jackson & Ruderman, 2013). SHRM should be viewed as a sustained effort rather than an one time, necessitating consistent approach and adjustments to accommodate evolving conditions (Jackson & Ruderman, 2013). SHRM serves as a holistic method of overseeing HR which priorities the enduring welfare of the company and its personnel. Organisations can achieve persistent sustainability and enhance their overall viability by implementing an inclusive and supportive workplace culture, minimising negative environmental impacts, and boosting employee morale and health (Flamini & Gnan, 2023).

This study will analyse the structure of sustainable HRM research and show how knowledge is developed and shared within the academic community by mapping citation patterns. Additionally, by visualising important contributors and their collaborative trends, collaboration networks will establish the connections between researchers and institutions of various countries. The citation analysis and collaboration network visualisation technique will also address the challenge in this developing research field. It will also help in identifying key publications and charting the collaborative environment in this arena. This study further will offer valuable insights on interconnectedness of the research and search the potential areas of future explorations.

In addition to the standard analysis of citations, the study utilised another innovative method, incorporating Citation context analysis (Anderson & Lemken, 2023). This approach enables scholars to assess the importance and relevance of a cited study within the larger academic community, providing a deeper understanding of how research concepts are applied and understood across various studies. The number and variety of citations within different sections of scholarly writing demonstrate the subject or topic's depth and maturity. Examining these citations in their textual context, based on their location, yields valuable information regarding the contextual relevance of cited sources (Sandra & Rupesh, 2024).

## LITERATURE REVIEW

To get the deeper understanding of the subject and clear the concept, the relevant literature from papers, articles, books on sustainable human resource management practices followed in different sectors Globally as well as Indian Perspective were reviewed cautiously.

Stankeviciute, Z & Savaneviciene, A commented that sustainable human resource management is an expansion of strategic human resource management. The author proposed sustainable human resource management as a response to shifting societal, labour market, and employee relations dynamics. The theoretical paper outlined several key attributes of sustainable HR management, including “employee involvement”; “employee development”; “long-term orientation”; “employee care”; “environmental care”, “profitability”; “employee involvement”; “employee development”; “employee cooperation”; “social dialogue”; “external partnerships”; “flexibility”; “compliance with labour regulations”; “fairness”; and “equality” (Stankeviciūtė & Savanevicienė, 2018).

Manzoor, F. *et al.*, in their study examined how sustainable HR management strategies influence the work performance. As per the authors, implementing eco-friendly work methods within the workplace lead to enhanced employee well-being, decreased environmental pollution, and subsequently improved business sustainability. The study underscored the necessity for businesses to establish environmentally conscious human resource management strategies to mitigate the adverse consequences on employee welfare and reap the cost savings resulting from eco-friendly endeavours. Further research indicated that training has a substantial moderating influence on the impact of HRM practices on employee performance, and sustainable HRM practices significantly affect job performance (Manzoor *et al.*, 2019). Ahuja, J *et al.*, discussed that there is growing interest worldwide in sustainable human factors and change management systems for the purpose of integrating sustainable practices into organisations. Research explored the five key factors such as “Green motivation”, “Customer relationship management”, “Management leadership”, “Communication”, and “Strategic alignment” which are crucial for sustainable manufacturing processes (Ahuja *et al.*, 2019).

Davidescu, A. A. *et al.* in their study examined the connection between employee growth and adaptability in work schedules and workspaces as key elements of sustainable HR management. The study further discussed on reformation of HR management. The authors also studied effects of various types of flexibility in enhancing overall employee job satisfaction. The study showed that the latest office spaces are highly valued by employees, resulting in a rising level of enthusiasm among them. The authors propose that a combination of “working from home” and “working in the office”, known as partial home working, can lead to improved performance of an organisation (Davidescu *et al.*, 2020).

Manuti, A. *et al.*, examined how employees perceived sustainable HRM during the COVID-19 pandemic and how much positive organizational behaviours such as extra-role behaviour and organizational engagement were influenced by perceptions of involvement, organizational support, and individual coping mechanisms related to organizational change. The study affirmed the critical role that sustainable HRM practices play in organizational performance and human resource capitalization during a period of extreme uncertainty and global crises (Manuti *et al.*, 2020).

Chan, J. K. L. *et al.*, in their study identified key emerging challenges impacting human resource practices and management within the contemporary employment environment, while also developing a sustainable framework for human resources in the hotel sector. The research specifically focused on operational, supervisory, and managerial roles within the Malaysian hotel industry. The paper presented a fresh perspective on sustainable HR management practices by utilising the “Resource-based view theory” with a focus on the hotel industry. The study also introduced a model of sustainable HR strategies that could provide a broad range of benefits both tangible and intangible (Chan *et al.*, 2021).

Paulet, R. *et al.*, in their study highlighted in their research that Sustainable HR Management holds the potential to enable the development of principles, policies, and practices within

organisations to address the challenges of the 21st century. The authors contend that the establishment of effective employee voice mechanisms is crucial for the successful implementation and ongoing maintenance of sustainable HRM practices. The authors also outlined the characteristics of the voice architecture and its relationship with employee interactions, using a conceptual framework to illustrate the impact. As per the authors, this framework could potentially be used as a foundation for further research on sustainable HRM (Paulet *et al.*, 2021).

Duvnjak, B. & Kohont, A. in their comprehensive literature review, found that existing misconceptions and varying levels of understanding for “sustainable development”, “corporate social responsibility”, and the relationship between strategic HR management and sustainable HR management. The author also proposed a model for measuring the sustainable development levels, which would allow organisations to identify their position and generate reports (Duvnjak & Kohont, 2021).

Piwowar Sulej, K. highlighted that sustainability has become increasingly significant, thereby shaping the development of a sustainable HRM (SHRM) approach, with HR development being one of the SHRM principles that should be consistently implemented alongside other SHRM principles. The author examined the findings of three research projects that employed the survey method, utilising representative data from Eurostat and Statistics Poland. The research noted that Polish industrial companies tend to have a narrow short-term view when it comes to maximising their engineers' potential and HR development methods solely focused on current requirements fail to align with SHRM principles prioritising a long-term outlook and adaptability (Piwowar-Sulej, 2021).

Tortia, E. C. *et al.*, examined the effects of sustainable human resource management strategies on organisational output. According to the study, HRM practices focused on giving employees autonomy in their tasks, encouraging teamwork, and involving them in decision-making processes have a positive effect on job satisfaction. At the same time, job satisfaction is increased when employees are involved in the organisation and receive support with their workload, which in turn leads to improved organisational performance. Although it failed to confirm the mediating role of intangible satisfaction, yet the author found that its influence contributed positively to involvement in enhancing performance (Tortia *et al.*, 2022).

Bal, M. & Brookes, A. examined the concept of sustainability within the context of Human Resource Management. The paper explored fresh and unconventional interpretations for sustainable HR management and assessed the existing HR systems and practices. The study also examined sustainable human resource management within the context of planetary preservation and the role of organisations for sustainable economies (Bal & Brookes, 2022).

Mariappanadar, S. & Hochwarter, W. A., examined the function of the United Nations' SDG, aiming to facilitate human sustainability through the integration of occupational health and sustainable human resources management perspectives. The research focused on identifying the connections between work characteristics, including “job demands”, “job resources”, and “employee engagement” and “employee well-being” (Mariappanadar & Hochwarter, 2022).

Genari D. & Macke J. identified the effects of sustainable HR management strategies on employee commitment within an organisation. As per the findings of the study, SHRM practices can be presented by three dimensions such as “attraction and retention of professionals”, “maintenance of healthy and motivated professionals”, and “development of professionals' skills”. The authors commented that these practices have a substantial and beneficial effects. The authors further suggested that sustainable HRM practices are crucial for long-term organisational success (Genari & Macke, 2022).

Mitra, S., explored the drivers of sustainability, including environmental and social practices, and their impact on the performance of Indian manufacturing small to medium-sized enterprises. Studies showed that the corporate ethical standards including leadership of all stakeholders i.e. owners, managers, employees had a substantial positive influence on overall performance of the organisation. Additionally, according to the author, there was a positive correlation between sustainable HRM practices and waste management. The study identified the key implications for management and suggested potential avenues for further research (Mitra, 2022).

Madero-Gómez, S. M. *et al.*, examined the part sustainable practices play in both employee health and environmental conservation. the negative impacts of office settings on employee well-being and how it in turn affects the Sustainable Development Goals. A systemic literature review of existing literature found that adopting environment friendly practices within the workplace contributes to the overall wellbeing of employees and minimizes pollution, ultimately enhancing the financial stability of a business. The study also underscored the importance for companies to develop sustainable human resources management plans in order to mitigate the negative impacts on employee welfare and benefit from the cost reductions achieved through environmentally conscious practices (Madero-Gómez *et al.*, 2023).

Alshammari, A. S. *et al.*, explored the ability motivation opportunity (AMO) theory to increase sustainable human resources management in the digital environment. The authors explored whether implementing sustainable e-HRM could lead to enhanced firm performance. The authors proposed that SEHRM played a significant mediating role in the connection between e-HRM practices and business results, and to implement SEHRM systems, priority should be given to e-HRM practices that enhance employees' capabilities and motivation (Alshammari *et al.*, 2023).

Bahmani, S. *et al.*, noted that the COVID-19 had a severe impact on the education sector, resulting in a significant challenge for academics and professionals to improve it once the pandemic had passed. The research explored “Green HR management” initiatives as a standalone factor which is focused on the innovation and the outcome was measured among the education staff through the green innovation factors (Bahmani *et al.*, 2023).

Mishra, A. A. & Pathak, D. K. in their study proposed a unified model for the integration of Industry 4.0 technology adoption and sustainability in human resource management. The study used “Total interpretive structural modelling” methodology illustrating the relationship of the identified factors & ultimately developed a seven-level hierarchical framework. The study uncovered that enablers in the 'environmental dimension' possessed the greatest driving power, while those in the 'organizational', 'technological', and 'people' dimensions trailed behind (Mishra & Pathak, 2024).

Adhikari D. R. *et al.*, investigated the level of integration of sustainable development goals (SDGs) into human resource management (HRM) systems of Nepalese businesses. The authors proposed that a comprehensive approach to sustainable human resource management is necessary to address future environmental, social, and economic issues. The author further commented that the concept of sustainability to achieve the SDGs, as in Nepalese enterprises, it is primarily viewed through the perspective of corporate social responsibility (Adhikari *et al.*, 2024).

Baldassari P. *et al.*, in their study explored the relationship between the Sustainable Development Goals (SDGs) and human resource management (HRM) strategies & practices to integrate the global transition to sustainable development with the transformation of organisations into more sustainable entities. The authors noted that Sustainable Human



Resource Management is a crucial component of a company's sustainability strategy and transformation. The analysis identified the key components of Sustainable HRM as “business human rights”, “green HRM practices”, “support for migrants”, “diversity and inclusion management”, “health and well-being”, and “learning”. This research has also underscored the significance of Sustainable HRM in achieving the SDGs (Baldassari *et al.*, 2024).

Maley J. F. in his article commented that sustainable people management fosters a long-lasting business. As per the author, developing and sustaining a sustainable HR management policy poses numerous issues for companies. The article examined the negative effects resulting from economic uncertainty and the benefits of adopting a sustainable Human Resources Management strategy. The authors developed a model built on “Resource-Based View” theory to implement a sustainable HRM strategy in periods of uncertainty (Maley, 2024).

Siddique N. *et al.*, examined the growth pattern, documentation, international scholarly publications, global authorship, scientific output and thematic emphasis in the field of sustainable human resource management. The research employed thematic mapping to determine that sustainable HRM remains a developing and current idea. Researchers reached the conclusion that sustainable human resource management should be a top priority for corporations, focusing on environmental and sustainability issues. The Sustainable human resource management should align with international sustainability benchmarks, and businesses should create HR guidelines prioritizing sustainability while investing in data analysis tools. The authors also stated that academic and industrial collaboration can enhance the field more rapidly (Siddique *et al.*, 2024).

Akbar Y. K. *et al.*, explored the effect of human capital on the sustainable performance of the university using sustainable HR management as an intermediary factor. Authors indicated that sustainable HRM practices are a crucial element in achieving a sustainable university. The research findings suggested that enhancing competence and calibre of the faculty & other associated professionals is crucial in developing university human capital, thereby ensuring long-term success in higher education. The researcher finally determined that universities must implement the sustainable HR management strategies with utmost care to enhance their performances across all verticals (Kandhias Akbar *et al.*, 2024).

## OBJECTIVES

- To explore the annual publication and citation trends in Sustainable HRM research.
- To determine the most influential authors articles in Sustainable HRM research based on citation analysis.
- To analyse the countries with the highest citations frequency in this research domain using citation analysis and visualise the diverse collaborations.
- To identify the top frequently cited organisations in this research domain utilising citation analysis and visualise its various collaborations
- To determine the top frequently referenced sources, articles in research domain utilising citation analysis and visualise its various collaborations
- To explore the citation context categorisation in smart citing index i.e Scite.ai
- To analyse how are citations distributed across the “Introduction”, “Methods”, “Results”, “Discussion”, and “Other” sections of scholarly articles.

## METHODOLOGY

This study conducts a comprehensive citation analysis and collaboration network visualization to examine the landscape of Sustainable HRM research. Using a title search for "Sustainable

HRM," which searched 169 papers initially, the methodology focused on gathering data systematically from the databases of the “Scopus” and the “Web of Science”. The dataset was further refined, deleting duplicate articles, narrowing it to 148 articles. The filtered data was exported in CSV format for further analysis. Microsoft Excel was used for initial data organization, while VOS viewer software was employed to visualize the collaboration network. VOS viewer effectively maps relationships between authors, institutions, and countries, revealing the collaborative nature of research in Sustainable HRM.

Further, the contextual citation information has been obtained from the Scite.ai platform (<https://scite.ai/>), utilising 138 accepted Digital Object Identifiers (DOIs) which were associated with the publications previously retrieved from the “Scopus” and “Web of Science”. The Scite.ai, a smart citation index utilises advanced natural language processing methods to categorize citation intent based on research (Nicholson *et al.*, 2021) . The Scite.ai offers in-depth analysis of citation frequency and context, also grouping citations as “supporting” which provide positive evidence or agreement, “contrasting” which indicate negative evidence or disagreement, and “mentioning” which acknowledge the existence of another study without evaluative context (Nicholson *et al.*, 2021).

## DATA ANALYSIS AND INTERPRETATION

Table 1 highlights that the citation frequency fluctuates significantly across the years, with the highest number of citations in 2022 (1410), and the lowest in 2015 (0). A positive relative frequency indicates a net increase in citations for the year 2014, 2016, 2017, 2018, 2019, 2020, and 2022 while a negative relative frequency suggests a decrease in citations for the years 2015, 2021, 2023, 2024. The total number of citations grew significantly between 2014 and 2020, especially in 2018 and 2020. Despite of fluctuations, the cumulative frequency continues to increase year on year, signifying a steady increase in the total citation count. The data shows a strong upward trend in citations over the years, with some fluctuations.

**Table 1: Year wise citation analysis**

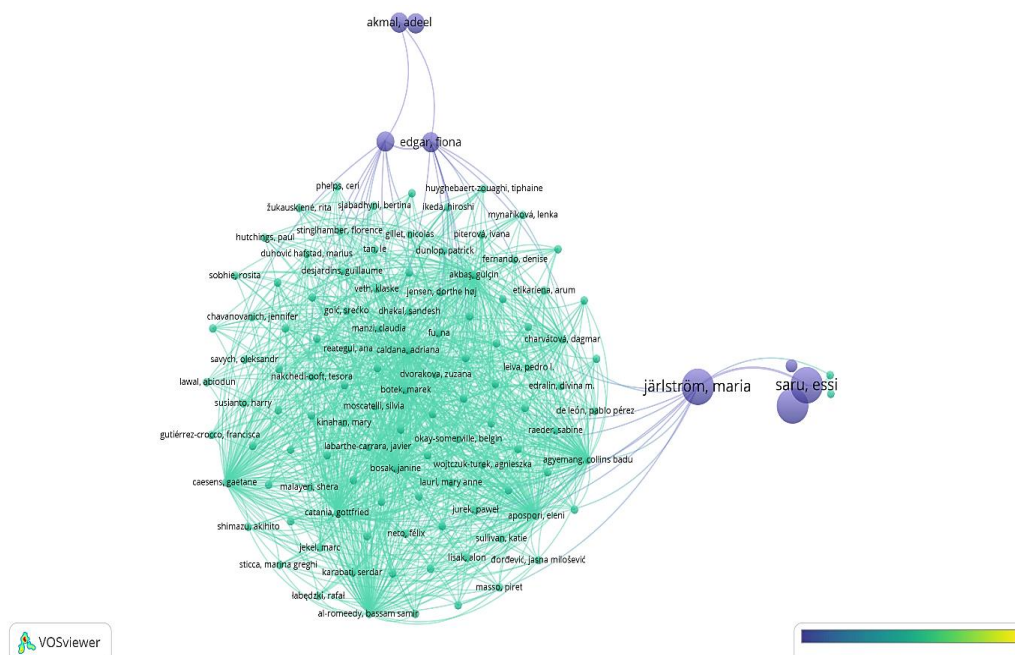
Year	Frequency (Citations)	Relative frequency	Relative frequency %	Cumulative Frequency	Cumulative Relative Frequency	Cumulative relative frequency %
2014	606	0.088248143	8.824814329	606	0.088248143	8.824814329
2015	0	-0.088248143	-8.824814329	606	0.088248143	8.824814329
2016	27	0.003931848	0.393184797	633	0.092179991	9.217999126
2017	125	0.014271152	1.427115189	758	0.110382991	11.03829911
2018	463	0.049220912	4.922091161	1221	0.177806903	17.78069026
2019	852	0.056647736	5.664773555	2073	0.30187855	30.18785496
2020	1349	0.072375127	7.237512742	3422	0.498325324	49.8325324
2021	991	-0.052133392	-5.213339158	4413	0.642638707	64.26387069
2022	1410	0.061016456	6.101645551	5823	0.847968545	84.79685452
2023	667	-0.108198631	-10.81986311	6490	0.945099752	94.50997524
2024	377	-0.04223096	-4.223095966	6867	1	100
<b>Total</b>	<b>6867</b>					

Table 2 highlights the top ten cited authors in Sustainable HRM research. “Agyemang, Collins Badu” is in the lead with 147 citations in four documents. He has the highest total link strength of 117 and an average of 36.75 citations per document, showing substantial collaboration. “Akbaş, Gülçin” has the highest average citations per document (48.6667) from three

documents. Vanhala, Sinikka has a substantial citation counts 140. Their average citations per document are 140, showing consistent influence. “Akmal, Adeel”, “Akrivou, Kleio” have a total link strength of 113 whereas “Al-romeedy, Bassam Samir” and “Apospori, Eleni” have a total link strength of 110 suggests notable collaboration, while “Bosak, Janine”, “Galvez-sierra, Lady Brigitte” have lower link strength 3 points to more independent contributions. However, both the authors have an average citation count of 20. Furthermore, “Phelps, Ceri” have the lowest citation counts of 5 and total link strength is 2 suggesting a more independent research approach.

**Table 2: Top 10 Authors by Citations in Sustainable HRM Research**

Sl. No.	Author(s)	Country	Documents	Citations	Avg. Citations	Total link strength
1	Agyemang, Collins Badu	Ghana	4	147	36.75	117
2	Akbaş, Gülçin	Turkey	3	146	48.6667	7
3	Vanhala, Sinikka	Finland	1	140	140	2
4	Akmal, Adeel	New Zealand	2	21	10.5	113
5	Akrivou, Kleio	United Kingdom	2	21	10.5	113
6	Al-romeedy, Bassam Samir	Egypt	1	1	1	110
7	Apospori, Eleni	Greece	1	1	1	110
8	Bosak, Janine	Ireland	1	20	20	3
9	Galvez-sierra, Lady Brigitte	Colombia	1	20	20	3
10	Phelps, Ceri	United Kingdom	1	5	5	2



**Figure 1: Collaborative Network Visualization Map of Cited Authors in Sustainable HRM Research**



**Table 3: Top 10 Countries by Citations in Sustainable HRM Research**

Sl. No.	Countries	Document(s)	Citation Frequency	Avg. Citations	Link strength (Total)
1	Australia	15	911	60.7333	446
2	United Kingdom	10	314	31.4	42
3	Poland	10	256	25.6	42
4	Sweden	2	219	109.5	30
5	Belgium	5	170	34	103
6	China	9	151	16.7778	43
7	Finland	4	147	36.75	16
8	Italy	5	140	28	85
9	Pakistan	8	133	16.625	98
10	India	13	130	10	32

Table 3 presents the top 10 countries by citations in Sustainable HRM research. “Australia” is at the forefront with 911 citations across 15 documents, highlighting its significant influence by averaging 60.7333 citation frequency on each document, and demonstrating robust international collaboration with a total link strength of 446. “United Kingdom” and “Poland” have the second most documents of 10 with substantial citation counts 314 for “United Kingdom” and 256 for “Poland”, and their average citations per document are 31.4 and 25.6. “Sweden” has lesser documents but is having higher citation count & the highest average citation counts 109.5 with a total link strength 30 reflecting a highly influential research output despite its smaller volume. “Belgium”, “Pakistan”, “Italy” have a total link strength of 103, 98, 85 respectively showing broader and concentrated impact whereas “China”, “India” and “Finland” are having a lower total link strength 43, 32 and 16 respectively, indicating a less concentrated impact although these countries are having a good number of citations of their documents.

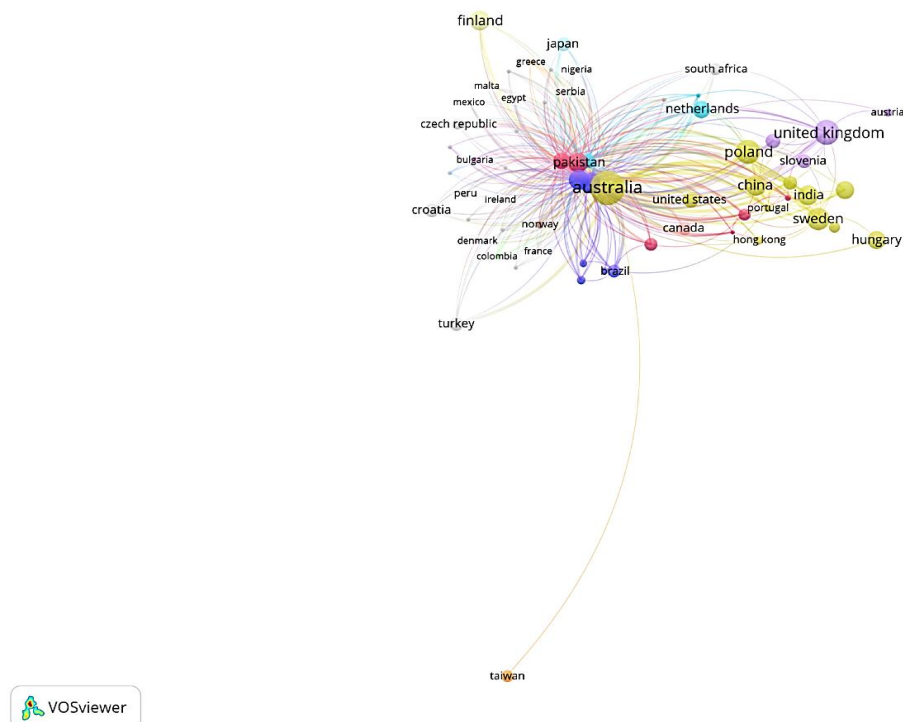
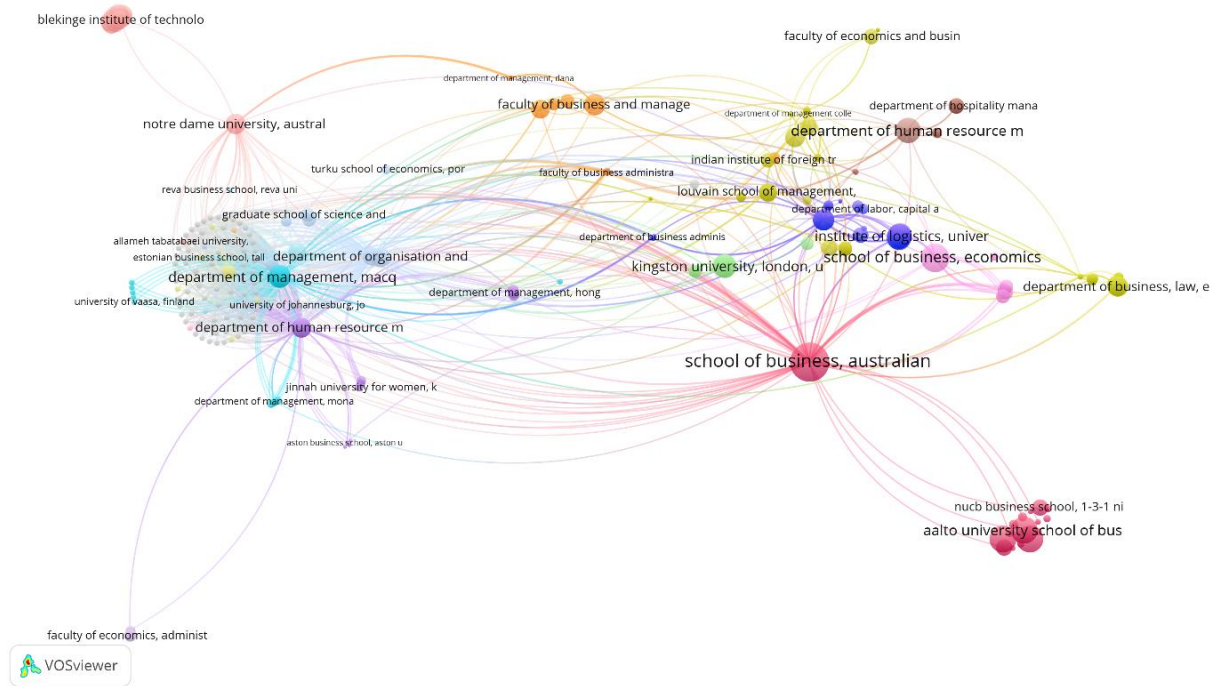
**Figure 2: Collaborative Network Visualization Map of Cited Countries in Sustainable HRM Research**

Table 4 highlights the top 10 organizations by citations in Sustainable HRM research. The “School of Business of Australian Catholic University at Sydney, Australia”, leads with 510 citations across one document, reflecting a strong influence averaging 510 citations on each document with the strongest link strength of 214. The ““School of Business of Economics and Law of University of Gothenburg, at Vasagatan 1, Gothenburg, Sweden”, stands out with the second highest average citations per document (178) with a total link strength of 53, indicating exceptionally impactful research. The “Aalto University School of Business at Aalto, Finland”, “Turku School of Economics, of University of Turku at Turun Yliopisto, Finland, “University of Vaasa, Vaasa, Finland” and the “Department of Human Resource Management, University of Strathclyde at Glasgow, United Kingdom” also show significant influence with 140,140,140 and 122 citations respectively with the same average citations. The “Bahria Business School of Bahria University at Islamabad, Pakistan”, the “Department of Accounting of Prince Sultan University at P.O. Box 66833, Riyadh, Saudi Arabia”, the “Department of Agricultural Economics and Management of Zhejiang University at Hangzhou, China” and the “Institute of Logistics of University of Miskolc at Miskolc, Hungary” achieve average citations 99 per document demonstrating the quality and impact of their research despite a smaller number of publications. The institutions, particularly from “Australia”, “Sweden”, “Finland” and “United Kingdom”, are key players in Sustainable HRM research, as indicated by their high citation averages and collaborative efforts.

**Table 4: Top 10 organizations by citations in Sustainable HRM research**

Sl. No.	Organisation	Document (s)	Citation Frequency	Avg. Citations	Link Strength (Total)
1	“School of Business, of Australian Catholic University at Sydney, Australia”	1	510	510	214
2	“School of Business of Economics and Law of University of Gothenburg, at Vasagatan 1, Gothenburg, Sweden”	1	178	178	53
3	“Aalto University School of Business at Aalto, Finland”	1	140	140	1
4	“Turku School of Economics of University of Turku at Turun Yliopisto, Finland”	1	140	140	1
5	“University of Vaasa at Vaasa, Finland”	1	140	140	1
6	“Department of Human Resource Management of University of Strathclyde, at Glasgow, United Kingdom”	1	122	122	20
7	“Bahria Business School, of Bahria University at Islamabad, Pakistan”	1	99	99	4
8	“Department of Accounting of Prince Sultan University at Riyadh, Saudi Arabia”	1	99	99	4
9	“Department of Agricultural Economics and Management, of Zhejiang University at Hangzhou, China”	1	99	99	4
10	“Institute of Logistics, University of Miskolc, Miskolc, Hungary”	1	99	99	4



**Figure 3: Collaborative Network Visualization Map of Cited Organizations in Sustainable HRM Research**

Table 5 presents the top 10 sources by citations in Sustainable HRM research. “Sustainability” leads with 3137 citations across 36 documents, demonstrating significant engagement and recognition in the field. The “Journal of Cleaner production” has the second highest citation of 645 citations across their 6 documents whereas “International Journal of Human Resource Management” boasts the highest average citations per document (256.5), highlighting its focus on impactful topics on Sustainable HRM. “Sustainability (Switzerland)”, “Journal of Business Ethics”, “International Journal of Hospitality Management”, “Journal of Sustainable Tourism”, and “Environment Development and Sustainability” also show a high citation of 391,191,178,143 and 134 respectively, with fewer documents, indicating its contributions are highly valued. “Human Resource Management” and “Heliyon” are having lesser citation compared to other. However, despite publishing one article, the “Heliyon” has an average of 88 citations per document, reflecting its influence.

**Table 5: Top 10 Cited Sources by Citations in Sustainable HRM Research**

Sl. No.	Source	Document (s)	Citation Frequency	Avg. Citations
1	Sustainability	36	3137	87.13
2	Journal of Cleaner Production	6	645	107.5
3	International Journal of Human Resource Management	2	513	256.5
4	Sustainability (Switzerland)	5	391	78.2
5	Journal of Business Ethics	2	191	95.5
6	International Journal of Hospitality Management	1	178	178
7	Journal of Sustainable Tourism	2	143	71.5

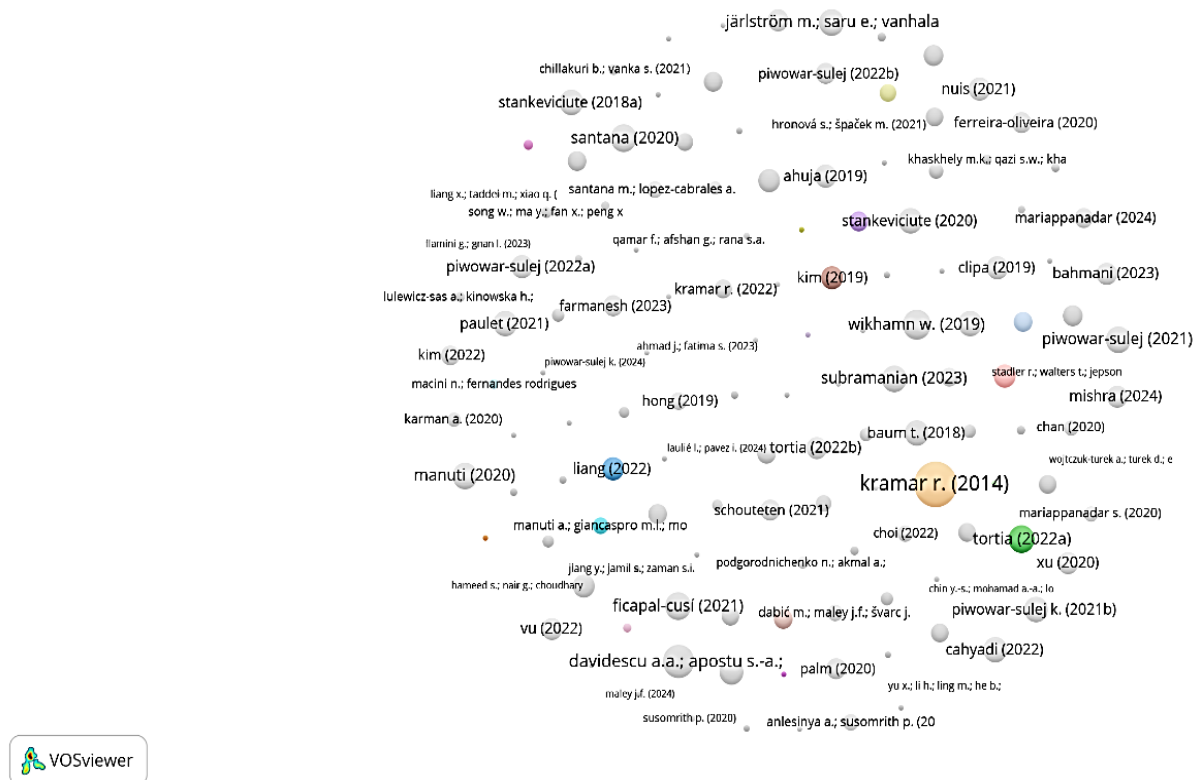
8	Environment Development and Sustainability	1	134	67
9	Human Resource Management	3	92	30.66
10	Heliyon	1	88	88

Table 6 highlights the top 10 most cited articles in sustainable HRM research. The article “Beyond strategic human resource management: Is sustainable human resource management the next approach?” leads with 510 citations with link strength of 89 indicating its foundational role in the field. “Work flexibility, job satisfaction, and job performance among Romanian employees-Implications for sustainable human resource management” follows closely with 241 citations but the link strength (8) is lower shows no link strength, suggesting it is highly referenced but not yet central to collaborative efforts, and “Human resources development as an element of sustainable HRM - with the focus on production engineers” has the highest link strength (149), highlights the significance of sustainable HR management. The “Innovation, sustainable HRM and customer satisfaction” has 178 citations but “A Human Growth Perspective on Sustainable HRM Practices, Worker Well-Being and Organizational Performance,” “Enhancing team performance: A multilevel model”, “Mapping the Link between Corporate Social Responsibility (CSR)” and “Human Resource Management (HRM): How Is This Relationship Measured?”, and “Sustainable Human Resource Management with Salience of Stakeholders: A Top Management Perspective” are having citation between 140-145 range whereas “Economic sustainability factors influencing the implementation of sustainable HRM in manufacturing SMEs”, “Human resources development as an element of sustainable HRM - with the focus on production engineers”, and “Everything Will Be Fine: A Study on the Relationship between Employees' Perception of Sustainable HRM Practices and Positive Organizational Behavior during COVID19” are having citations between 130-135 range.

**Table 6: Top 10 Articles by Citations in Sustainable HRM Research**

Sl. No	Title	Author(s)	Year	Publisher	Citations	Total Link Strength
1	<i>“Beyond strategic human resource management: Is sustainable human resource management the next approach?”</i>	Kramar Robin	2014	Taylor & Francis	510	89
2	<i>“Work flexibility, job satisfaction, and job performance among Romanian employees-Implications for sustainable human resource management”</i>	Davidescu, Adriana Ana Maria; Apostu, Simona-Andreea; Paul, Andreea; Casuneanu, Ionut	2020	MDPI	241	8
3	<i>“Innovation, sustainable HRM and customer satisfaction”</i>	Wikhamn, Wajda	2019	Elsevier Ltd	178	30
4	<i>“A Human Growth Perspective on Sustainable HRM Practices, Worker Well-Being and Organizational Performance”</i>	Tortia, Ermanno C; Sacchetti, Silvia; Lopez-Arceiz, Francisco J	2022	MDPI	145	103
5	<i>“Enhancing team performance: A multilevel model”</i>	Ficapal-Cusi, Pilar; Enache-Zegheru, Mihaela; Torrent-Sellens, Joan	2021	ELSEVIER SCI LTD	143	42

6	<i>“Mapping the Link between Corporate Social Responsibility (CSR) and Human Resource Management (HRM): How Is This Relationship Measured?”</i>	Santana, Monica; Morales-Sanchez, Rafael; Pasamar, Susana	2020	MDPI	143	6
7	<i>“Sustainable Human Resource Management with Salience of Stakeholders: A Top Management Perspective”</i>	Järlström M.; Saru E.; Vanhala S.	2018	Springer Netherlands	140	13
8	<i>“Economic sustainability factors influencing the implementation of sustainable HRM in manufacturing SMEs”</i>	Subramanian, N; Suresh, M	2023	SPRINGER	134	27
9	<i>“Human resources development as an element of sustainable HRM - with the focus on production engineers”</i>	Piwowar-Sulej, Katarzyna	2021	ELSEVIER SCI LTD	132	149
10	<i>“Everything Will Be Fine: A Study on the Relationship between Employees' Perception of Sustainable HRM Practices and Positive Organizational Behavior during COVID19”</i>	Manuti, Amelia; Giancaspro, Maria Luisa; Molino, Monica; Ingusci, Emanuela; Russo, Vincenzo; Signore, Fulvio; Zito, Margherita; Cortese, Claudio Giovanni	2020	MDPI	130	99



**Figure 4: Collaborative Network Visualization Map of article citations in Sustainable HRM Research**

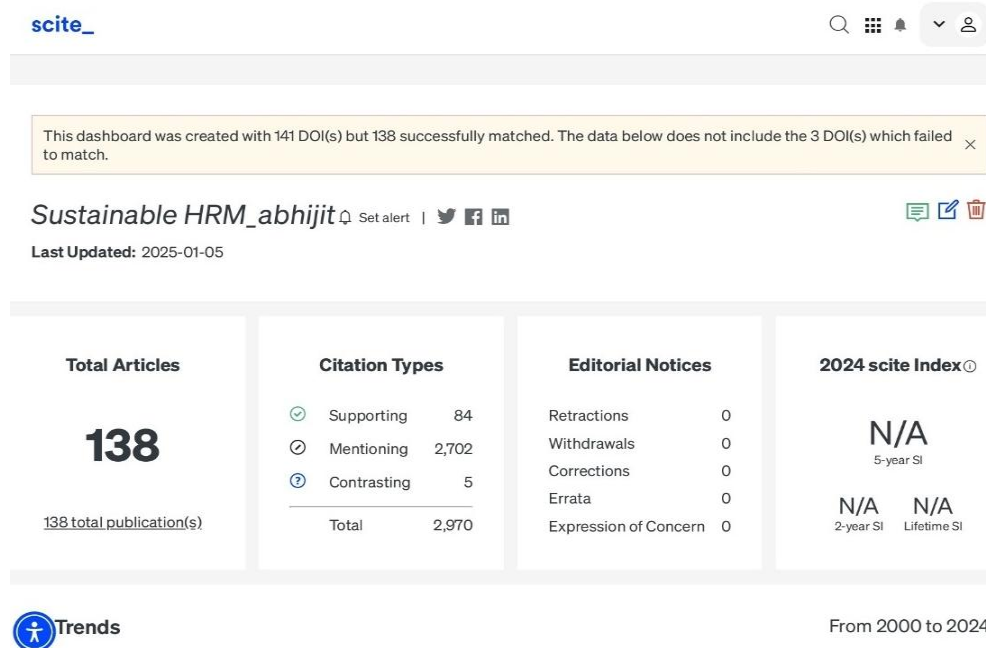


The newer article “Economic sustainability factors influencing the implementation of sustainable HRM in manufacturing SMEs” has 134 citations. “Human resources development as an element of sustainable HRM - with the focus on production engineers” published by Elsevier Sci Ltd in 2021 has the highest total link strength of 149 appears highly integrated within the collaboration network due to its niche focus. Highly cited articles significantly influence Sustainable HRM research, while those with high link strength are crucial for fostering research collaboration and advancing the field.

Table No 7 highlights that most authors cite the other studies in the sustainable HRM domain in a neutral manner, as computed by the fact that out of total cites, 2702 (90.976%) are mentioning citations. The trend indicates that authors tend to cite previous studies without necessarily supporting or challenging them. This pattern suggests a cautious strategy for expanding on current research, which is probably designed to preserve academic neutrality or avoid disagreement. There are 84 (2.828%) supporting citations. The number is less compared to the mentioning citations. The supporting citations provide valuable endorsements, increasing the credibility of both the referenced and current research, and promoting collaborative advancements in the field. The remaining citations, totalling 5 (0.168%), showed disagreement with the cited sources. These citations are crucial in fostering academic discussion by bringing forward diverse viewpoints and initiating thoughtful debate, ultimately propelling the development of concepts and expertise.

**Table 7: Citations context categorisation in Scite.ai**

Year of publications	Mentioning Citation	Supporting Citations	Contrasting Citations	Total Citations
2014-2024	2702	84	5	2970
Percentage	90.976%	2.828%	0.168%	--



**Figure 5: Scite.ai citation analysis report**

Articles in academic journals generally adhere to the established IMRaD format comprises of the Introduction, Methods, Results, and Discussion components (Sollaci & Pereira, 2004). The

platform Scite.ai utilises this format to organize references, methodically placing them under one of the core categories (Sandra & Rupesh, 2024). Some publications deviate from the IMRaD structure by using an alternative or non-standard section titles. The “Scite.ai” categorizes citations under the "Other" category for such instances. This categorization system allows Scite to group citations into five specific categories namely “Introduction”, “Methods”, “Results”, “Discussion”, and “Others”, providing a comprehensive summary of citation patterns across various scholarly works (Sandra & Rupesh, 2024).

The analysis in table 8 gives a detailed breakdown of the distribution of Supporting, Contrasting, and Mentioning citations within the five sections of academic articles: Introduction, Methods, Discussion, Results, and Other. The analysis of citation polarity, as tracked by Scite.ai, provides valuable insights into the intent and impact of citations within each section. The prevalence of cited references throughout all sections underscores the broad recognition and accessibility of research. The "Other" category garnered 1491 mentions, followed by the "Introduction" with 1173 mentions, “Discussion” with 994 mentions, “Methods” with 795 mentions and lastly the "Results" category with 503 mentions. The dominance of the "Other" section in all citation contexts highlights its significance in interdisciplinary and unconventional research. Its capability for accommodating diverse concepts and methodologies makes it as a central node for scholarly discussion, drawing both favourable endorsement and constructive critiques. Whereas the emphasis on citations in the "Introduction" highlights the crucial role of the same in framing research questions and offering background information. Further, number of the supporting citations in each section are higher than the contrasting citation. This reveals that research in Sustainable HRM field is gaining more acceptance than criticism. Also, the Sustainable HRM research is at its evolving stage and more research in this area is expected.

**Table 8: Section wise and intent based distribution of citations**

Sections	Supporting citation	Contrasting citations	Mentioning citations	Total citations
Introduction	36	2	1135	1173
Methods	38	2	755	795
Result	22	0	481	503
Discussion	30	2	962	994
Other	49	3	1439	1491
<b>Total</b>	175	9	4772	5137

## FINDINGS AND DISCUSSION

The research comprehensively analyses the scholarly landscape within Sustainable HRM research using citation analysis and collaboration network visualization. The study brings out the key insights into influential authors, countries, organizations, and publications. Over the years, citation frequency appears to increase overall, especially from 2016 to 2020, which could reflect a growing body of research in the sustainable HRM field. Leading contributors like “Agyemang, Collins Badu”, “Akbaş, Gülçin” and “Vanhala, Sinikka” are identified for their high citation counts and significant collaborative networks. The study highlights the impact of their work, with authors such as “Akbaş, Gülçin” showing high average citations per document.

Visualization maps reveal distinct collaboration clusters, with central authors driving research agendas and fostering interdisciplinary connections.

Major contributors to Sustainable HRM research include “Australia”, “United Kingdom”, “Poland”, “Sweden” leading in citations and “Sweden” showing the highest average citations per document. Strong international partnerships, particularly involving the “Australia”, “Sweden”, “Poland”, “China”, “India”, “Finland”, “Hungary” underscore the global nature of Sustainable HRM research. Institutions like the “School of Business of Australian Catholic University at Sydney, Australia” and the “School of Business, Economics and Law of University of Gothenburg, Vasagatan 1 at Gothenburg, Sweden” are noted for their influential contributions.

Key journals in the topic include “Sustainability”, ‘Journal of cleaner Production”, “International Journal of Human Resource Management”, and “Sustainability (Switzerland)”. Highly cited articles “Beyond strategic human resource management: Is sustainable human resource management the next approach?”, “Work flexibility, job satisfaction, and job performance among Romanian Employees-Implications for sustainable human resource management” highlighted the requirement of sustainable HR management, and recommended redesigning of existing HR management to include sustainability. The findings of this study highlight the value of interdisciplinary collaboration and offer a way forward by navigating this dynamic field of Sustainable HRM research.

The findings also indicate a dominance of mentioning citations (90.976%), suggesting an increasing trend toward neutral referencing whereas the supporting citations (2.828%) and contrasting citations (0.168%) provide valuable insights into academic validation and criticism. Finally, the study highlighted that the dominance of citations under the “Other” section in all contexts shows its importance in interdisciplinary and unconventional research in the sustainable HRM domain.

#### *Scope for further studies*

The future research on human resource management (HRM) in the Sustainable HRM domain has a broad reach. While several avenues can be pursued, the following are of particular interest:

- (a) Getting a deeper understanding of inter or cross-disciplinary efforts in implementing sustainable HRM practices.
- (b) Assessing the literature on the application of sustainability in HRM in various contexts. The focus should be given to emerging countries or regions in which social responsibility in HRM is still in the cradle.
- (c) Exploring how digital technologies like “Artificial intelligence”, “Generative AI”, and “Data analytics” reshape or assist in the execution of sustainable HRM practices.
- (d) Developing and validating the models or tools which can be used by the organisations for the purpose of embedding sustainability in their existing human resource management policies and practices.

Looking at these gaps, future studies can not only aim at adding contributions to the literature but also contribute to the practice of organisations that are interested in promoting sustainable HRM. This would in the end be beneficial to their employees and society.

## CONCLUSION

The study provides insightful information about the dynamics of Sustainable HRM research by emphasizing the number of studies taken place worldwide. The connections between important contributors and the development of significant research themes are analysed. Further, the study offers a comprehensive overview of the academic landscape by using citation analysis and collaboration network visualization, which may help researchers, decision-makers, and industry stakeholders in understanding the developing field of sustainable HRM. This study highlights the number of collaborations and its importance in interdisciplinary research. Additionally, the study also undermines the motivations behind citations to explore whether they are applied to support, challenge or constructed upon existing research, which ultimately provides a more in-depth understanding of academic interaction beyond the traditional cite analysis approach. There is a broad scope for Human Resource Management in the Sustainable HRM domain and it can contribute to the practice of organisations that are interested in promoting sustainable HRM apart from enriching the academic literature. Finally, the study also acknowledges “Scopus” & “Web of Science” for retrieving articles in sustainable HRM domain and “Scite.ai” for contextual analysis of the citations. This study's goal was to collect all relevant research in this area, but some articles might still be overlooked since only these two databases were analysed. Although this study chose only two databases, the analysis of these selections was conducted meticulously in a comprehensive and relevant way.

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