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Review

How Does Research on Sustainable Human Resource Management Contribute to Corporate Sustainability: A Document Co-Citation Analysis, 1982–2021

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Abstract: While the field of human resource management (HRM) has a long research tradition, the focus on sustainability has only gained momentum since the turn of the millennium. This bibliometric review examined key documents that inform scholarship in sustainable human resource management (S-HRM). The review identified 807 Scopus-indexed documents on sustainability in human resource management published between 1982 and 2021. Bibliometric analyses applied to this database included document citation and co-citation analysis to map peer-recognized documents. The review documented an emerging knowledge base that is global in scope with contributions from a variety of regions in the world. Three 'invisible colleges' emerged in the visual map of co-cited documents. These include green human resource management (Green HRM) with a focus on environmental aspects of sustainability, corporate social responsibility (CSR), and S-HRM with a focus on analyzing all three aspects of the triple bottom line of corporate output. These document analyses found that this emerging literature on S-HRM is heavily weighted towards environmental concerns. The authors recommend that greater attention be placed on the contributions that HRM makes to the human and social aspects of sustainability.

Keywords: sustainable human resource management; green human resource management; sustainability; science mapping; bibliometric analysis; document co-citation

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1. Introduction

The literature on managing for sustainability has grown substantially in the past 30 years [1,2]. This literature spans several management disciplines including supply chain management, knowledge management, strategic management, marketing, operations, and production. Within the management literature, one field of practice that has received comparatively less interest from scholars is HRM [3]. A recent meta-synthesis of research on sustainability in management found that scholarship on sustainable supply chain management achieved the highest citation impact while sustainable human resource management (S-HRM) evidenced the lowest [2].

From an historical perspective, research on the topic of S-HRM goes back to papers published as early as 1982, but it has only gained increased interest in the past 20 years [3]. Authors have increasingly introduced sustainability issues into research on the management of human resources. This has included a focus on the sustainability of the organization, as well as sustainability within different HRM functions [4]. This emergent focus on sustainability has begun to reorient HRM purposes and practices from a predominate concern with contributing to business productivity as defined by profitably towards the contributions that S-HRM can make to the 'triple bottom-line' of the economic, social, and environmental impact of the company. This challenges the traditional view that HRM primarily serves the purpose of achieving business shareholder value [5].

In a recent literature review on S-HRM, Aust, Matthews, and Muller-Camen [6] demonstrated how the search for sustainability is reshaping and transforming the role of corporate HRM. The authors identified several shifts in HRM practice that have evolved over time. For example, HRM perspectives have increasingly moved from an 'outside-in' perspective to an 'inside-out' perspective. This mirrors the sustainability paradigm which tends to adopt an 'inside-out' focus from the company to society. A recent addition to the S-HRM literature is found in 'common good HRM' which contributes to the common good in economic, environmental, social, and human dimensions. In this conception, S-HRM takes a wider perspective and includes the collective interests of society [6–8]. This emerging approach challenges HRM to support all stakeholders in creating common good through tackling sustainability challenges that imperil not only the company's long-term survival, but that of society and the planet.

In a recent bibliometric review of research on S-HRM [3], the authors employed 'author co-citation analysis' [9,10] in order to identify the main thematic clusters, or 'schools of thought', that comprise this emerging literature. The review highlighted four main schools of thought in the S-HRM literature: strategic HRM, corporate sustainability, Green HRM, and green supply chain management. The fact that only two of these four schools of thought fall squarely within the field of HRM suggests the 'trans-disciplinary' nature of sustainability studies, whereby scholars, policymakers and practitioners draw upon knowledge from diverse fields of management and sustainability sciences [1,2,11].

The driver behind this follow-up review lies in our desire to explore in more depth the knowledge base that undergirds this emerging literature on S-HRM. Document co-citation analysis offers a 'low inference' means of identifying the specific literature on which S-HRM scholars have drawn [12,13]. In author co-citation analysis, the researcher draws upon tacit knowledge of scholars frequently referenced by authors in the field under review in order to identify the thematic composition of the literature [14]. However, because an author's published works can encompass a fairly broad array of topics, author co-citation requires a rather high level of inference on the part of the reviewer. In document co-citation analysis, the names of documents frequently cited by authors in the review database are listed on the document co-citation map [13]. Thus, the examination of patterns revealed in a document co-citation allows for a more discrete identification of the extant theories and lines of inquiry in use by scholars within the particular field of study [15].

With these methodological distinctions in mind, we assert that a follow-up review which employs document co-citation can extend our understanding of the conceptual foundations of S-HRM by more clearly highlighting key theories that scholars are referencing in this literature. This identification of theoretical literature is particularly helpful for research that is being conducted in a problem-focused, 'trans-disciplinary' field such as S-HRM [13]. Thus, this bibliometric review of research aimed to contribute to the literature on S-HRM by clarifying the theoretical underpinnings of the field. We focused on three research questions.

RQ1: What is the volume and growth trajectory of the literature on S-HRM?
RQ2: What does the analysis of highly-cited documents on S-HRM suggest about the direction of this emerging field?
RQ3: What theoretical orientations and lines of inquiry underpin current conceptualizations of S-HRM based upon document co-citation analysis?

The paper is structured as follows. Section 2 provides the conceptual background for the study. Section 3 introduces the bibliometric review method, means of identifying source documents, and data analysis. Section 4 presents the results according to the sequence of the research questions. Section 5 provides an interpretation of the results and discusses the limitations of the findings. Section 6 concludes the paper and highlights several implications of the review.

2. Conceptual Background of the Review

The term 'sustainable HRM' was first coined nearly two decades ago. Since then, a substantial quantity of research has been published in this field (for recent reviews, see [4,6,16–18]). Numerous scholars have attempted to define the concept of S-HRM (see [4] for definitions). For instance:

- "Sustainable human resource management can only be implemented if it is based on individual responsibility of employees and is future-oriented. It is defined by methodological and instrumental approaches whose objectives are long-term-oriented, socially responsible and economically efficient recruiting, training, retaining and disemployment of employees. Increasing employability, guaranteeing a harmonious work-life-balance and enhancing individual responsibility take on an important role in the concept of sustainable human resource management." [19], p. 1.
- "Sustainable HRM is the pattern of planned or emerging human resource strategies and practices intended to enable organisational goal achievement while simultaneously reproducing the HR base over a long-lasting calendar time and controlling for self-induced side and feedback effects of HR systems on the HR base and thus on the company itself." [20], p. 74.
- "Sustainable human resource management is regarding to achieving organizational sustainability through the development of human resources policies, strategies and practices that support the economic, social and environmental dimensions, at the same time." [21], p. 226.
- "Sustainable HRM could be defined as the pattern of planned or emerging HR strategies and practices intended to enable the achievement of financial, social and ecological goals while simultaneously reproducing the HR base over a long term. It seeks to minimise the negative impacts on the natural environment and on people and communities and acknowledges the critical enabling role of CEOs, middle and line managers, HRM professionals and employees in providing messages which are distinctive, consistent and reflect consensus among decision-makers." [5], p. 1084.
- "Sustainable HRM is operationally defined as HRM practices and strategies that promote the renewal and regeneration of organisational human resource capacity and competence for short- and long-term survival and continued positive performance in terms of the various aspects of sustainability." [17], p. 296.
- "Sustainable HRM can be defined as the adoption of HRM strategies and practices that enable the achievement of financial, social and ecological goals, with an impact inside and outside of the organisation and over a long-term time horizon while controlling for unintended side effects and negative feedback." [22], p. 90.

A synthesis of the definitions of S-HRM indicates a number of important elements including:

- HRM system approach, e.g., HR policies, strategies, and practices, recruiting, and training
- diversity of organizational goals, e.g., financial, social, and ecological goals
- multiple stakeholders, e.g., CEOs, middle and line managers, HRM professionals, employees, communities, society, environment
- positive and negative HR impacts, e.g., increasing employability, guaranteeing a harmonious work-life-balance, and minimizing negative impacts
- the time dimension, e.g., long-term time orientation
- the context dimension, e.g., context inside and outside of the organization

The global business environment has rapidly changed over the last few decades owing to climate change, urbanization, an ageing workforce, and digital technologies, and many organizations today appear to respond to these challenges by pursuing multiple goals. As natural resources and social capital are becoming highly valued assets on a par with economic capital, the organization's success is redefined in terms of the triple bottom line [23], rather than solely on financial measures [24]. Consequently, S-HRM is evolving into a multidimensional model that considers long-term impact rather than

merely short-term concerns. HRM scholars have increasingly focused on two key tasks: to develop and implement S-HRM systems to improve human sustainability, e.g., [25–27] as well as to support the implementation of corporate sustainability strategies, e.g., [25,28,29]. Sustainability is employed as a means to achieve corporate sustainability goals as well as an end to design HRM systems and practices.

S-HRM can be analyzed on multiple levels, e.g., the macro/meso/micro levels of analysis [7,30]. At the macro level of analysis, the impact of HR strategies and practices on the environmental, social, human, and economic sustainability of society as a whole can be explored. This line of inquiry is supported by the recent literature on 'common good HRM' which calls for companies to contribute to the collective interests of society [6]. At the meso level of analysis, the focus is on the sustainability of organizations and their subsystems such as HRM. At the individual level of analysis, human sustainability on an individual (e.g., employee) level is at the center of attention [7,30].

An important area of the S-HRM literature that until today has received less attention is the focus on the paradox aspect of sustainability, in other words the dilemmas and tensions that arise when implementing sustainability strategies [8]. Inherent in the triple bottom line idea is an unspoken win-win-win assumption that mostly remains unchallenged in the S-HRM literature [7]. In reality, satisfying the demands of diverse stakeholders frequently leads to competing or even contradictory goals, e.g., increasing investments in human capital to support CSR might diminish shareholders' economic gains [8]. While these tensions and challenges have been pointed out by a number of authors [7,8,31], deeper insights into the challenges of S-HRM in practice have yet to be explored [30].

The utilization of bibliometric techniques in the discipline of HRM has been growing for years. Some bibliometric studies offered reviews of the HRM field [32–34]. Other bibliometric studies analyzed research on human resource training [35] and digital HRM transformation [36]. Additionally, a bibliometric analysis focused on the combination of HRM and supply chain management [37]. Despite these advancements, there is still a scarcity of scholarly work on S-HRM. Prior bibliometric reviews of research on S-HRM have been conducted by Garrigos-Simon, Botella-Carrubi, and Gonzalez-Cruz [38], Khan and Muktar [39], and Kainzbauer and Rungruang [3]. Specifically, Garrigos-Simon, Botella-Carrubi, and Gonzalez-Cruz [38] presented a bibliometric analysis on social capital and human capital related to sustainability, while Khan and Muktar [39]'s bibliometric review focused on Green HRM. Kainzbauer and Rungruang [3] employed bibliometric analysis to document the knowledge based in S-HRM.

The current review sought to build upon these earlier efforts in two ways. First, this review updates the literature through the middle of 2021. This may seem insignificant in light of the fact that bibliometric reviews have been published on S-HRM in recent years. However, as shall be shown in the results section, there has been a large increase in the number of papers published on this topic in just the past two years.

Second, this review focused heavily on the science mapping technique of document co-citation analysis [9,12]. As discussed by Gmür [12], document co-citation analysis offers an empirical means of identifying the 'invisible colleges' [14] that comprise a literature.

3. Method

The article employed a bibliometric review to analyze the knowledge base on S-HRM. The goals of bibliometric reviews are to analyze the characteristics of a knowledge base [40].

3.1. Identification of Sources for the Review

The Scopus index was used for the document search focusing on sustainability and HRM. The Scopus index was specifically selected due to its superior coverage of documents in management fields, as compared with the Web of Science [41]. Although potentially relevant articles have been published in multiple languages, this review limited eligibility to English language publications. This was due to the limited coverage of non-English language papers in the databases such as Scopus and the Web of Science.

The topical focus of the search sought to include the full range of HRM functions such as recruitment, training, and development. Broader topics such as leadership, strategic management or knowledge management were excluded from the search. Additionally, documents that did not have a specific focus on HRM or documents that only used the word 'sustainable' without demonstrating an explicit focus on sustainability were excluded from the search. The search included a full range of document types including journal articles, books, book chapters, and conference papers. The search used an open start date and continued to the end of April 2021.

Our initial search included the keywords (TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("Human Resource")). This search produced 6562 documents. We screened all document abstracts for eligibility and selected 629 relevant documents. We then conducted additional searches and assessed the resulting document abstracts for eligibility. All searches are summarized in Table 1 below:

Table 1. Search keywords and results.

Search Keywords	Number of Documents Found	Number of Eligible Documents After Screening
TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("Human Resource")	6562	629
TITLE-ABS-KEY ("triple bottom line") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("Human Resource")	55	33
TITLE-ABS-KEY ("CSR") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("Human Resource")	566	228
TITLE-ABS-KEY ("appraisal") AND TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("human resource")	73	19
TITLE-ABS-KEY ("recruitment") AND TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY	209	50
TITLE-ABS-KEY ("succession planning") AND TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability")	77	2
TITLE-ABS-KEY ("Training") AND TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR") OR TITLE-ABS-KEY ("human resource")	1029	132
TITLE-ABS-KEY ("Development") AND TITLE-ABS-KEY ("sustainable") OR TITLE-ABS-KEY ("sustainability") AND TITLE-ABS-KEY ("HR")	1679	131
Total	**10,250**	**1224**

The Scopus search followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for conducting systematic reviews of research [42]. Screening of documents was conducted by two of the authors, who jointly developed the conceptual background for this study and jointly reviewed document titles and abstracts for eligibility. The most common reason for excluding documents was lack of topical relevance. A large number of documents included the abbreviation 'HR' which, however, stood for something other than 'human resources'. The second most common reason for excluding documents was lack of a substantive focus on HRM. In a number of documents, HRM was mentioned as one of several corporate functions, but the article lacked a focus specifically on HRM. A third reason was that documents used the word "sustainable" in a general way, but sustainability was not a central focus of the study. Finally, during this iterative search process, some newly selected documents were duplicates that had already been identified in earlier searches. The 1224 eligible documents were merged into a single list comprised of 807 S-HRM Scopus-indexed documents (see Figure 1).

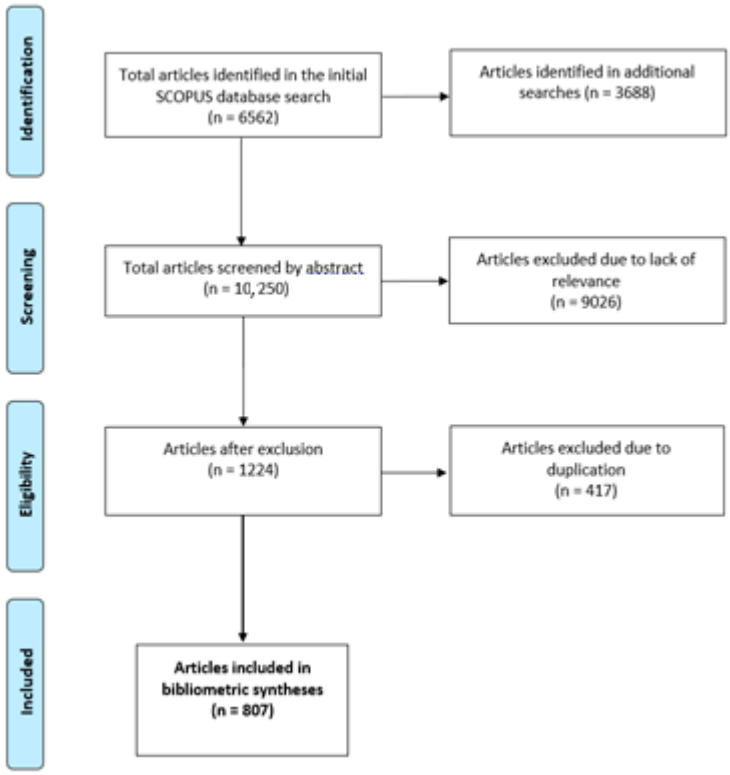


Figure 1. PRISMA flow diagram showing the steps followed in the identification and screening of sources for the review.

3.2. Data Analysis

The bibliometric analyses conducted for this review combined performance analysis and science mapping [43–45]. More specifically, descriptive statistics and document citation analysis were combined with science mapping in the form of document co-citation analysis to examine the literature on S-HRM [14].

However, prior to beginning data analysis, the exported Scopus data associated with the 807 documents had to be 'cleaned' [40]. In bibliometric analysis, the 'source data' include the author names, journal title, keywords, and document title along with the various citation data. Since these source data comprise the basis for the analysis and findings, they must be cleaned prior to analysis [46]. For examples, the exported Scopus list included documents authored by Douglas Renwick alternately as Renwick, D., Renwick Douglas, and Renwick D.W.S. Similarly, the names of journals and documents cited within the list could appear in different reference formats. This ambiguity would threaten the accuracy of the analysis if, for example, Renwick's citations were listed as separate authors [46]. Thus, as recommended by van Eck and Waltman [45], a thesaurus file was created in order to 'disambiguate' data with the same meaning but expressed in different forms [46,47]. The thesaurus file, for example, instructed the analytical software (i.e., VOSviewer, ver. 1.6.16) to replace all instances of D. Renwick and Douglas Renwick with D. Renwick during the data analysis. The thesaurus file developed for this review included document names and cited references.

Descriptive statistics were employed to analyze the nature of the S-HRM database from the perspectives of size, growth, and geographical distribution. The citation and co-citation analyses offered complementary perspectives on the impact and influence of related documents in this literature. Descriptive analyses were conducted in Microsoft Office Excel and Scopus. VOSviewer software was employed to create a visual map of contributions in the literature on sustainable HRM. This software was developed for the 'visualization of similarity' (VOS); in other words, it allows visualizing the relatedness of items on a map [45].

Scopus citation analysis was employed to assess the 'impact' of documents located in our S-HRM database (i.e., the 807 documents). In this analysis, VOSviewer software version 1.6.16 was used to calculate the frequency with which each of the 807 S-HRM documents were cited in the references of other Scopus documents. This analysis, therefore, identified the highest impact Scopus-indexed documents that were published on S-HRM [10].

Next, document co-citation was used to understand sources of influence on scholars writing about S-HRM. Document co-citation analysis (DCA), conducted in VOSviewer, analyzes the frequency with which documents were 'cited in the reference lists of documents located in the S-HRM database [10]. Thus, DCA offers insight into the knowledge base that has informed S-HRM authors. Notably, while this usually includes some 'S-HRM documents', DCA often surfaces additional theoretical sources that underlie the primary literature [9,13]. Thus, DCA was used to identify the intellectual lineage or 'theoretical roots' of different literatures [2,9,12].

A second feature of document co-citation draws on its ability to identify 'pairs of documents frequently cited together in the reference lists of the review database' [10,48]. The analysis of documents that are frequently cited together by other scholars was used to gain insights into the relationships among documents that comprise a knowledge base. This is based on the assumption that there is often an intellectual similarity among documents that frequently appear together in the reference lists of other documents [10,40,49,50]. Building on this assumption, VOSviewer software has the capability of generating DCA maps that use document co-citation data to visualize the relationship among highly co-cited documents in the literature [48]. By interpreting the resulting 'document clusters' on a DCA map, scholars are able to identify the 'invisible colleges' that comprise a particular literature [1,2,10,12,13,50]. DCA visualization in VOSviewer was used in the current review to analyze the intellectual structure, or 'invisible' colleges' that make up the S-HRM literature.

4. Results

Presentation of the results follows the sequence of the research questions that guided the review.

4.1. Size and Growth Trajectory of the S-HRM Literature

As noted above, earlier bibliometric reviews conclude that the size of the knowledge base on S-HRM was small when compared with other management literatures in sustainability [1–3]. However, the knowledge base on S-HRM has seen an impressive increase in publications within the last few years.

The first relevant document identified in our search dates back to the year 1982. During the subsequent decades, the field emerged slowly until 2010 when a significant increase in the annual publication of S-HRM documents began (see Figure 2). During the next five years, the annual rate of publication of S-HRM documents doubled. In 2018, an unprecedented 'tipping point' was reached with a 154% increase in publication of relevant documents. In total, 61% of the identified Scopus-indexed knowledge base on S-HRM was published between 2018 and April 2021.

The documents' distribution included journal articles (79%), conference papers (8%), book chapters (6%), reviews (5%), as well as books (1%) and editorials (0.2%). The database featured documents from a variety of countries. About 60% of the documents were authored by scholars in Anglo-American-European (AAE) nations. Forty percent of contributions came from Asia and Latin America, with a majority of papers from China, India, Malaysia, and Brazil.

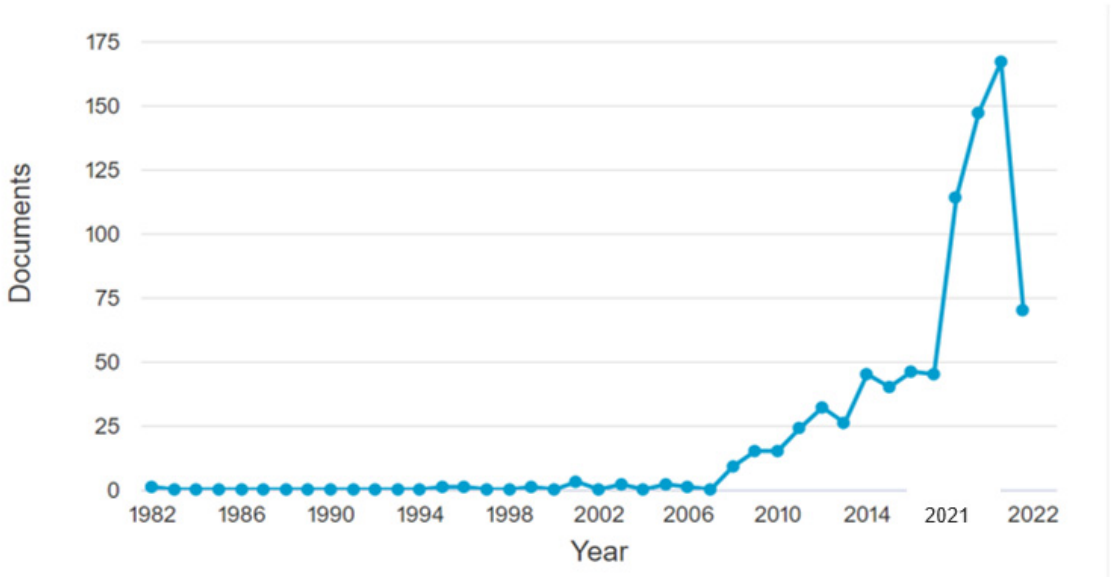


Figure 2. Growth trajectory of the literature on S-HRM 1982-2021 (n = 807).

4.2. Document Citation Impact of the S-HRM Literature

The next step in our analysis aimed to identify the most highly cited documents in the S-HRM database (see Table 2). The citation data in Table 2 show that the 20 most highly-cited S-HRM documents have yet to achieve high levels of Scopus citation impact. Even the most highly cited paper in the list has only received a relatively low number of Scopus citations (489 citations). In comparison, Nimsai, Yoopetch, and Lai [51] reported that the top-cited paper in the sustainable supply chain literature had gained 3365 Scopus citations. Even the 10th ranked paper identified in their review gained 400 Scopus citations. This was despite the fact that date distribution of highly-cited papers in S-SCM and S-HRM was quite similar (i.e., ranging from 2001).

Table 2. Most highly cited documents on S-HRM, 1982–2021.

Rank	Author, Year	Document Title	TBL Pillar [1]	Paper Type [2]	Scopus Citations
1	Daily and Huang, 2001 [52].	Achieving sustainability through attention to human resource factors in environmental management.	Env	Con	489
2	Jackson, Schuler, and Jiang, 2014 [53].	An aspirational framework for strategic human resource management.	Econ-Soc-Env	Con	372
3	Boudreau and Ramstad, 2005 [54].	Talentship talent segmentation and sustainability.	Econ-Soc-Env	Con	257
4	Kramar, 2014 [5].	Beyond strategic human resource management.	Eco-Soc-Env	Con	231
5	Jackson, Renwick, Jabbour, and Muller-Camen, 2011 [55].	State-of-the-art and future directions for green human resource management.	Env	Con	224
6	Jabbour and de Sousa Jabbour, 2016 [56].	Green human resource management and green supply chain management.	Env	Con	221
7	Lee, 2009 [57].	Why and how to adopt green management into business organizations?	Env	Emp	188
8	Jabbour and Santos, 2008 [58].	The central role of human resource management in the search for sustainable organizations.	Econ-Soc-Env	Con	185
9	Bohdanowicz, Zientara, and Novotna, 2011 [59].	International hotel chains and environmental protection.	Env	Emp	175
10	Jabbour, 2013 [60].	Environmental training in organisations.	Env	Rev	156

Table 2. *Cont.*

Rank	Author, Year	Document Title	TBL Pillar [1]	Paper Type [2]	Scopus Citations
11	Morgeson, Aguinis, Waldman, and Siegel, 2013 [61].	Extending corporate social responsibility research to the human resource management and organizational behavior domains.	Env	Con	152
12	Shen and Benson, 2016 [62].	When CSR is a social norm.	Econ-Soc	Emp	149
13	El-Kassar and Singh, 2019 [63].	Green innovation and organizational performance.	Econ-Env	Emp	146
14	Jackson and Seo, 2010 [64].	The greening of strategic HRM scholarship.	Env	Con	144
15	Garavan and McGuire, 2010 [65].	Human resource development and society.	Econ-Soc-Env	Con	126
16	Fang, Wu, and Wu, 2015 [66].	Impact of the supervisor on worker safety behavior in construction projects.	Soc	Emp	124
17	Teixeira, Jabbour, and de Sousa Jabbour, 2012 [67].	Relationship between green management and environmental training in companies located in Brazil.	Env	Emp	124
18	Teixeira, Jabbour, de Sousa Jabbour, Latan, and de Oliveira, 2016 [68].	Green training and green supply chain management.	Env	Emp	123
19	Jabbour, Jugend, de Sousa Jabbour, Gunasekaran, and Latan, 2015 [69].	Green product development and performance of Brazilian firms.	Econ-Env	Emp	121
20	Jamali, El Dirani, and Harwood, 2015 [70].	Exploring human resource management roles in corporate social responsibility.	Econ-Soc	Con	120

[1] Eco = Economic; Soc = Social; Env = environment. [2] Con = conceptual; rev = review of research; emp = empirical.

The comparatively low number of citations in the S-HRM literature may be explained in part by two factors. First, the level of HRM citations in general are less than those of other management disciplines such as supply chain, operations, strategy, marketing, and finance. Moreover, it was noted above that fully 60% of the database of S-HRM documents analyzed in this review were published in the past three years. Thus, these papers have yet to gain a wide readership and subsequent citations.

The most frequently cited documents shown in Table 2 indicate an imbalance among conceptual (11 documents), empirical studies (eight documents), and research reviews (one document). While this distribution may not reflect the nature of the full database of S-HRM documents, it is nonetheless noteworthy. Reviews of research often feature in lists of most frequently cited documents due to their synthesis of findings from many other studies. The low frequency of reviews in this list may reflect the relatively recent emergence of this literature. Thus, this finding represents both a gap and an opportunity relevant for future scholarship.

The highly cited documents evidence a split between two broad topics. The first set is comprised of papers focusing on different aspects of 'Green HRM', e.g., [68,69]. These include defining the elements of Green HRM [52,55] and analyzing the relationship of HRM to practices that support environmental management [56,57,63]. These authors also focused on how (strategic) HRM systems contribute to the environmental performance of firms, e.g., [52,53,55,64]. Specifically, Daily and Huang [52] developed a conceptual model that identified HR factors (encompassing top management support, environmental training, employee empowerment, teamwork, and rewards) as key elements of the implementation process of an environmental management system.

The second set is represented by articles that seek to define S-HRM more broadly [53,58,70]. When organizations adopt the environmental sustainability philosophy, employee training is often leveraged in order to support new practices, e.g., [55,60,67,68].

For example, Lee [57] conducted a case study of the adoption of green management practices in Korean small and medium-sized manufacturing enterprises. He found that employees at first were reluctant to participate, feeling that it represented extra workload imposed on them. Top management introduced a training and education program that was designed to raise their awareness and develop specific green management skills. This

reduced resistance and employees gradually became motivated to participate in new green management practices.

Similarly, Teixeira and colleagues [67] conducted multiple case studies at large ISO 14001 certified companies in Brazil. They found that top management support, corporate culture, and more technical green management practices were factors that connect and convert environmental training into more proactive green management.

In addition to training, other HRM policies and practices that can enhance environmental performance include those related to recruitment and selection [55,56], teamwork [52,56], performance management [55,56], compensation and rewards [52,55,56], empowerment [52,56], and CSR [59,61]. Recruitment and selection practices can help ensure that the organization attracts and hires job applicants who understand the company's environment concerns, share its environment values, are knowledgeable, and care about environmental sustainability [53]. When pursuing environmental sustainability, organizations also need to motivate and engage their employees by clearly communicating on how they will be evaluated and rewarded for their ecological behaviors.

Next, we sought to classify the documents according to their sustainability focus. Two researchers independently read the titles and abstracts of the 20 documents and classified each one using a set of keywords. Out of the 20 highly cited papers, nine documents addressed multiple triple bottom line outcomes. Indeed, five papers employed an in-depth analysis of triple bottom line outcomes [5,53,54,58,65]. The other four focused on two sustainability pillars (e.g., Eco/Env, Eco/Soc) [62,63,69,70]. Out of these 20 key papers, 10 documents focused primarily on environmental impact [13,52,55–57,59–61,64,67,68] and only one document focused extensively on social impact [66].

It is interesting to note that the social and human aspect of sustainability has received relatively little attention within S-HRM compared with the environmental dimensions. This finding is in line with the mainstream of sustainability literature which has been strongly influenced by environmental issues [1,2], while social elements (impact on people) have only recently received attention [22,27]. This is a noteworthy finding, given that the literature on 'sustainable HUMAN resource management' could be expected to have a stronger focus on the 'social/human' aspect compared with the rest of the sustainability literature—which is apparently not the case.

4.3. Document Co-Citation Impact of the S-HRM Literature

Next, we conducted document co-citation analysis (DCA) in order to gain insights on scholarly influence of key literature by examining the documents most often cited in the reference lists of the S-HRM review database. As noted earlier, DCA examines the reference lists of the core S-HRM documents with the goal of identifying frequently cited secondary literature. The most frequently co-cited documents in this literature are shown in Table 3. Overall, the level of document co-citations was relatively low (86 citations for the top ranked paper in the list and 26 citations for paper #20 in the list). This is related to the relatively 'small' size of the underlying document database (i.e., 807 documents).

Table 3. Most frequently co-cited documents on S-HRM.

Rank	Author, Year	Document Title	Domain on DCA Map [1,2]	Type [3]	Co-Citations
1	Renwick, Redman, and Maguire, 2013 [71].	Green human resource management.	Green HRM	Rev	86
2	* Kramar, 2014 [5].	Beyond strategic human resource management.	Sustainable HRM	Con	67
3	Barney, 1991 [72].	Firm resources and sustained competitive advantage.	Sustainable HRM	Con	59
4	Paillé, Chen, Boiral, and Jin, 2014 [73].	The impact of human resource management on environmental performance.	Green HRM	Emp	52
5	* Jackson and Seo, 2010 [64].	The greening of strategic HRM scholarship.	Sustainable HRM	Con	48
6	* Jabbour and Santos, 2008 [58].	The central role of human resource management in the search for sustainable organizations.	Green HRM	Con	43
7	Jabbour and Santos, 2008 [74].	Relationships between human resource dimensions and environmental management in companies: Proposal of a model.	Green HRM	Con	42
8	Pfeffer, 2010 [27].	Building sustainable organizations: The human factor.	Sustainable HRM	Con	34
9	* Daily and Huang, 2001 [52].	Achieving sustainability through attention to human resource factors in environmental management.	Green HRM	Con	33
10	Govindarajulu and Daily, 2004 [75].	Motivating employees for environmental improvement.	Green HRM	Con	33
11	Masri and Jaaron, 2017 [76].	Assessing green human resources management practices in Palestinian manufacturing context.	Green HRM	Emp	33
12	Tang, Chen, Jiang, Paillé, and Jia, 2018 [77].	Green human resource management practices: Scale development and validity.	Green HRM	Emp	33
13	Jabbour, Santos, and Nagano, 2010 [78].	Contributions of HRM throughout the stages of environmental management.	Green HRM	Emp	32
14	Brammer, Millington, and Rayton, 2007 [79].	The contribution of corporate social responsibility to organizational commitment.	CSR	Emp	31
15	Greening and Turban, 2000 [80].	Corporate social performance as a competitive advantage in attracting a quality workforce.	CSR	Con	31
16	* Jabbour and de Sousa Jabbour, 2016 [56].	Green human resource management and green supply chain management.	Green HRM	Con	31
17	Daily, Bishop, and Massoud, 2012 [81].	The role of training and empowerment in environmental performance.	Green HRM	Emp	29
18	Huselid, 1995 [82].	The impact of human resource management practices on turnover, productivity, and corporate financial performance.	Sustainable HRM	Emp	29
19	Ehnert et al., 2016 [22].	Reporting on sustainability and HRM: A comparative study of sustainability reporting practices by the world's largest companies.	Sustainable HRM	Emp	27
20	Dumont, Shen and Deng, 2017 [83].	Effects of Green HRM practices on employee workplace green behavior.	Green HRM	Emp	26

[1] See document co-citation analysis map in Figure 3; [2] CSR = corporate social responsibility; [3] Con = conceptual; rev = review of research; emp = empirical. Documents marked with * were part of both the highly-cited and highly co-cited documents

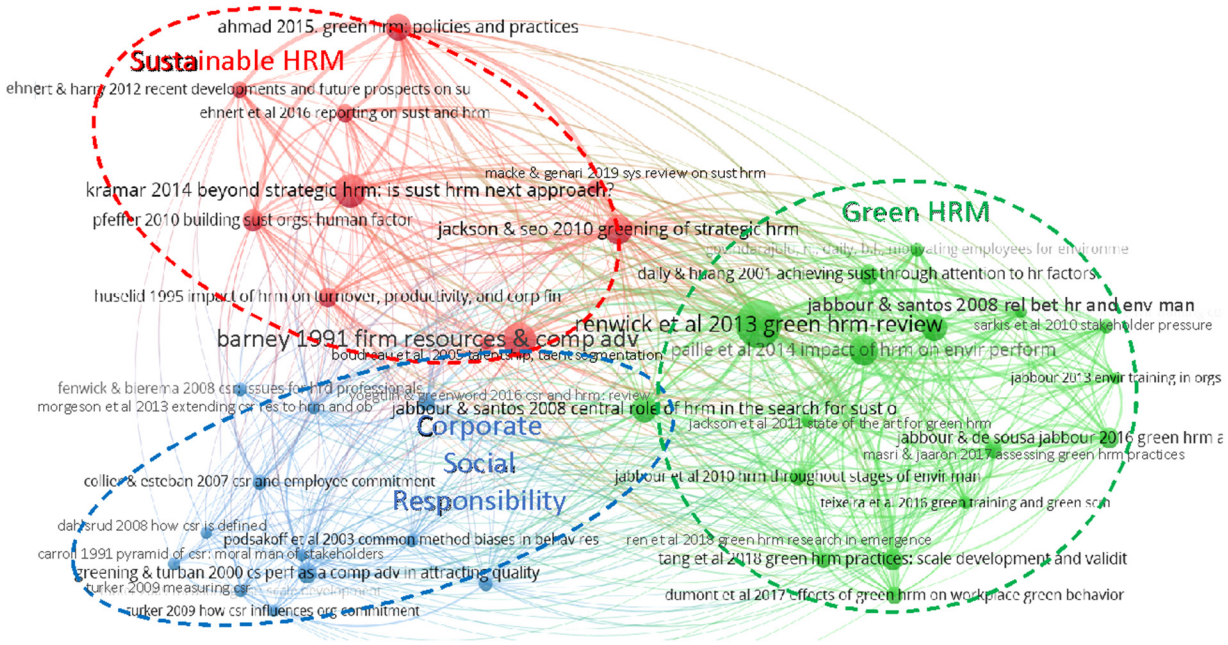


Figure 3. Document co-citation map of research on S-HRM, 1982-2021 (citation threshold 17, display 39 documents; created in VOSviewer ver. 1.6.16 [84]).

The distribution of documents by 'paper type' revealed an almost even split between conceptual (10 documents) and empirical papers (nine documents), and again a paucity of research reviews (one document). Notably, the only research review that is frequently referenced in this literature is, however, the most highly co-cited document in the database. This, again, suggests opportunities for providing greater integration of theory and empirical findings in this literature.

Next, we classified the 20 most frequently cited references contained in the review database according to the thematic domains identified in Figure 3 below (as grouped by VOSviewer software). Twelve of the documents were associated with 'Green HRM', six documents were classified under 'sustainable HRM', and two under 'corporate social responsibility'.

In terms of the content of these 20 most frequently co-cited documents, 12 focused on green/environmental HRM, 3 documents focused on the contribution of HRM towards organizational sustainability, and 2 on the positive impact of CSR on (1) attracting employees [80] and (2) making them committed to the organization [79]. Only one document in the top-20 list focused solely on 'human sustainability', i.e., on the effects of business activity on people [27]. The two oldest documents in the list were the only documents that focused exclusively on the 'profit' aspect of the triple-bottom-line, i.e., these articles had a focus on corporate performance/sustained competitive advantage [72,82]. These papers were frequently cited by S-HRM scholars because they provided a broader contribution on the link between strategic management [72] and HRM [82] on corporate (financial) performance.

Five documents (marked with *) were part of both the highly-cited and highly co-cited documents. This affirms the influence of these papers. They were articles with a focus on the role of HRM for organizational sustainability [5,58] and articles with a specific focus on green/environmental aspects of HRM [52,56,64].

4.4. Thematic Structure of the S-HRM Knowledge Base and Lines of Inquiry

VOSviewer generated a document co-citation map which visualizes relationships among frequently co-cited documents. The size of the nodes in Figure 3 is an indicator of the relative frequency of document co-citation. The density of links between documents reflects

the relative frequency which the two documents have been 'co-cited' in the documents located in the S-HRM database. Documents whose nodes are close together on the map were frequently co-cited by other authors, thus demonstrating closer intellectual connection in the eyes of the authors' peers [13].

The DCA map features three clusters, or what Gmür [12] called 'invisible colleges' that represent the key research streams in this literature (see Figure 3). The green cluster is comprised of 17 documents related to Green HRM. The 12 documents located in the blue cluster are concerned with CSR. The red cluster consists of 10 documents that are explicitly linked to S-HRM. The size and numerous large nodes in the Green HRM cluster suggest the strength of the environmental pillar in this literature. However, the more central location of the S-HRM cluster on the map and the numerous links to both of the other clusters offer indications of the intellectual centrality of this document cluster to the literature.

The green cluster 'Green HRM' consists of 17 documents that sought to define and study how HRM functions can contribute to environmental goals of organizations and societies. The document with the highest number of citations in the green cluster (and the highest number of citations overall among all co-cited papers) was authored by Renwick and colleagues [71]. It proposed the integration of the literatures on environmental management and HRM research. The authors highlighted the contributions of key HRM areas such as recruitment and selection, training, development, performance management and appraisal, pay and reward systems on environmental management, and the achievement of corporate goals for environmental action. Other papers in this cluster make similar calls for integration of environmental management and HRM, e.g., Daily and Huang [52] and Jabbour and Santos [74].

The authors of the second-most highly ranked paper in the 'Green HRM cluster' [73] conducted an empirical study to prove that a firm's S-HRM practices indeed contribute to the improvement of environmental performance. In fact, about 50% of papers in this cluster were empirical papers, reporting on studies in a variety of countries including, e.g., Brazil, China, Germany, Palestine, and Spain. These empirical studies advanced the scholarship on environmental contributions of HRM by exploring how Green HRM practices contribute to environmental performance [76] and the contribution of HRM throughout different stages of environmental management [78]. A number of empirical papers researched the impact of environmental training [67,68,85]. Tang and colleagues [77] conducted two studies to develop and validate an instrument to measure Green HRM.

Two conceptual papers in the green cluster call for more research on the role of HRM in achieving environmental sustainability and provide future directions for the 'greening' of HRM [55,86]. Several papers in the cluster take a narrower approach and focus on a specific aspect of HRM. For example, Govindarajulu and Daily [75] focused on how to motivate employees for environmental improvement. Jabbour [60] examined the topic of environmental training in organizations.

The most central paper on the DCA map [58], still part of the green cluster but with numerous links to all three clusters, provided a boundary spanning contribution. It explored the main contributions of HRM to develop sustainable organizations with a specific focus on the full range of triple bottom line outcomes.

The blue cluster 'CSR' consists of 12 documents related to CSR. This cluster is the second biggest cluster on the co-citation map in terms of number of documents, but has the least number of citations among the three clusters. Even the most highly cited paper in this cluster has a total of only 31 citations (compared with 86 citations for the highest cited document in the Green HRM cluster) which indicates the relatively lower impact of the CSR topic on the S-HRM literature. A dominant theme among the top ranked papers [79,80] in this cluster is the focus on the role of CSR to attract employees and/or increase their commitment to the organization. Papers by Collier and Esteban [87] and Turker [88] also contribute to this theme. Conceptual papers on CSR and HRM also play a central role in this cluster [61,89].

A number of papers in this cluster focus on CSR without a specific link to HRM, e.g., reviews of the CSR literature [90], conceptual explorations of CSR [91], and CSR measurement [92]. This cluster also includes papers which are not related to CSR. They focus on research methods [93,94] and have informed the scholarship on CSR.

The red cluster, representing S-HRM, was the smallest of the three clusters (i.e., 10 documents). These documents were partly located between the green and blue clusters, while some were located at the edge of the map at a distance from the other clusters. Four of the documents from the red cluster were positioned between the blue and the green clusters, indicating a boundary-spanning role between the themes on the map. These four documents include papers by Barney [72] and Huselid [82], both of which do not focus on sustainability in the sense of the triple bottom line, but instead focus on the impact of HRM on corporate financial performance [82] and firm resources and sustained competitive advantage [72]. The paper by Boudreau and Ramstad [54] emphasized the role of HRM in identifying talent for strategic success which goes beyond financial outcomes and encompasses sustainability. The fourth paper in this group was positioned at the edge between the red and green clusters and discussed the 'greening of strategic HRM' scholarship [64]. The authors advocated for a broader definition of strategic HRM, to not equate 'strategic' with 'financial', but rather include the consequences of HRM for multiple stakeholders and explore the role of strategic HRM as a change agent to make corporations more environmentally sustainable. The central position of these papers indicates that they influenced the scholarship in all three clusters.

The rest of the documents in the red cluster were positioned at a distance from both the blue and green clusters, indicating a lower degree of co-citations with other clusters. The most highly cited document (67 citations) in the red cluster was Kramar's [5] article 'Beyond strategic human resource management: is sustainable human resource management the next approach?' where she examined the relationship between sustainability and HRM and presented S-HRM as a new approach to managing people, an approach which takes an explicit moral position, uses a multidisciplinary approach, and embraces complexity and ambiguity. This article is also the second most frequently co-cited article in the entire S-HRM knowledge base, indicating a high influence on the field.

Pfeffer's [27] paper is the 4th most highly co-cited paper in the red cluster and is noteworthy as it specifically pointed out "the relative neglect of the human factor in sustainability research" (p. 34). He noted an enthusiasm for green management in the sustainability literature, and a dearth of literature on 'human sustainability', which led him to raise the research question: "Why are polar bears . . . more important than people, not only in terms of research attention, but also as a focus of company initiatives?" (p. 35). Ehnert et al. [22] reported on a comparative study of sustainability reporting practices by the world's largest companies. Other documents in the red cluster provide reviews of the S-HRM literature [4,7].

Overall, the DCA map indicated that the S-HRM cluster is an emerging cluster. It contained fewer documents than the 'Green HRM' and 'CSR' clusters. Nonetheless, it contained two of the top three most highly-cited documents on the map. The central location of the S-HRM cluster with links to both other clusters also indicated that the S-HRM literature has had a significant influence on both the 'Green HRM' and 'CSR' clusters. The map also showed that there were relatively fewer connections between the 'Green HRM' and the 'CSR' clusters, indicating that these literatures are less integrated so far, but might benefit from cross-fertilization.

In the sustainability literature in general, the environmental aspect of sustainability was the first to receive attention [2]. Our DCA map showed that in the literature on S-HRM, the green aspect similarly is more influential in the field, as indicated by the size of the green cluster on the map. The enthusiasm for Green HRM and the dearth of literature on the human aspect of HRM, which Pfeffer [27] already pointed out in 2010, appears to be still prevalent in 2021.

The DCA map revealed that current conceptualizations of S-HRM are based upon earlier concepts of strategic HRM which itself has its heritage in strategic management. The oldest document on the DCA map is Barney's [72] strategic management article which advocates a 'resource-based view'. According to this theory, firm resources (such as employees) that are valuable, rare, difficult to imitate, and difficult to substitute generate long-term competitive advantage. The second oldest document on the map is Huselid's [82] article, which drew on Barney's work, and explored the impact of high performance HRM practices on corporate financial performance.

A number of documents in the S-HRM cluster, e.g., [5,54,64] refer to the evolution from 'strategic HRM' with a focus on effectiveness in terms of a firm's financial measures, to the broader conceptualization of 'sustainable HRM' with a focus on triple bottom line outcomes. Literature that addresses the evolution of S-HRM mentions that organizations that want to become more sustainable need to have a more holistic vision and adopt a long-term perspective and a change in their competitive priorities and organizational values [58,95]. The role of HRM as a central corporate function is of overarching importance in this process due to its influence on setting priorities and hiring talent to fulfill these priorities. 'Sustainable human resource management' challenges the paradigm of 'strategic human resource management' by changing the 'strategic focus' of the company from a traditional, purely economic perspective to a broader focus on sustainability in terms of the triple bottom line.

Boudreau and Ramstad [54] pointed out a second crucial paradigm shift in this regard, i.e., the paradigm shift from the traditional paradigm of HR as a service provider inside the company to the new paradigm of HR as a partner in strategic human capital decisions. Combining the new paradigm of sustainability with the new paradigm of HR, the strategic talent question becomes: "Does human resource management make the best decisions about the management of talents which are critical for sustainability?" (p. 133). Macke and Genari [4] emphasized the dual focus on sustainability within S-HRM, which includes a focus on the sustainability of the organization, as well as sustainability within different HRM functions.

Stakeholder theory [96] is another central underlying theory in the S-HRM literature. This perspective advocates for the interconnectedness of a business and its stakeholders, including employees, customers, suppliers, investors, communities, and others. In strategic HRM, creating value for stakeholders implied that HRM must address the needs of both internal and external stakeholders [53]. In the sustainable HRM literature, this concern for stakeholders goes beyond strategic HRM in two ways. First, it expands the stakeholders to include still broader interests, e.g., the collective interests of society and future generations [4,5]. Second, it broadens the conceptualization of 'corporate effectiveness' from financial metrics to triple bottom line outcomes. For example, Jabbour and Santos [58] proposed that S-HRM should support innovation management, cultural diversity, and environmental management in a balanced way. They also foresaw that environmental awareness will lead to innovations related to managing the diversity of human resources, thus indicating a mutual fertilization among the different pillars of the triple bottom line.

During the evolution of strategic HRM, critics pointed out the inherent conflict between the striving for business relevance of HRM systems and the traditional role of HRM as the "pro-employee advocate" [53], p. 21. S-HRM seems to suffer from a similar lack of focus on the pro-employee aspects (over green and economic aspects). Pfeffer [27] attributed this to the underlying and often implicit ideology of performance, efficiency, and rationality in management studies. This ideology also includes the presumption of choice—while the natural environment (plants and animals) does not have free choice, people have a choice (assuming that people would not stay in a company if it does not treat them well). According to this ideology, the environment deserves our protection more than people who supposedly have free choices. Underlying ideologies and implicit assumptions are therefore topics that need to be brought into the focus of sustainable HRM research.

Newer conceptualizations such as the 'paradox' aspect of sustainability [5,7], which addresses the complexity and ambiguity of aiming to achieve often conflicting sustainability goals, remain scarce on the DCA map of most highly co-cited documents. Some documents addressing negative externalities were not included in the map (e.g., Mariappanadar's [97] article on the sustainable and unsustainable dilemmas of retrenchment, and the 2012 article by the same author [98] on the harm of efficiency-oriented HRM practices on stakeholders) because they did not meet the co-citation threshold of 17, indicating that their level of peer recognition remains lower. The paradox aspect has received more attention recently, e.g., [8,31] but these contributions have yet to achieve high citation levels.

5. Discussion

This bibliometric review aimed at providing insights into the structure of the knowledge base and key theoretical literature in the field of S-HRM. Science mapping was used to analyze 807 Scopus-indexed documents published between 1982 and 2021. This discussion highlights the key findings and limitations of our review.

5.1. Interpretation of the Findings

Our findings indicated that the scholarship on S-HRM has seen a dramatic increase in publications in the past few years, with contributions from a variety of countries. Nonetheless, the field of S-HRM still shows a relatively low citation impact compared with the sustainability literature in other management disciplines. This can be explained by the fact that 60% of the documents in our database were published from 2018 onwards and have thus not yet achieved a high impact level.

The low frequency of reviews among the 20 top-cited papers in this knowledge base also speaks to the recent emergence of this literature and presents an opportunity for future research.

Our analysis of the 20 top cited documents and 20 top co-cited documents revealed a dominance of Green HRM topics, with a balance between conceptual and empirical contributions. This indicates that the literature on sustainable 'human' resource management seems to be more focused on the environment and less on humans. This relative neglect of the 'human aspect' in the S-HRM literature has previously been pointed out by a number of authors who even advocated the inclusion of the human dimension as a fourth aspect into the 'triple-bottom line' [7,27].

The co-citation analysis confirmed the dominance of Green HRM contributions as the biggest cluster in the S-HRM literature. The CSR cluster was the second biggest cluster, but had the lowest citation impact among the three clusters. The smallest and least connected cluster comprised documents related specifically to S-HRM. This indicates that the knowledge base is still relatively fragmented with a majority of contributions adopting a one- or two-dimensional focus of sustainability, whereas the impact of contributions with a multidimensional focus is less integrated. The S-HRM cluster however contained two of the three most highly cited documents on the DCA map, thus pointing to the emerging importance of this literature.

A structural analysis of the knowledge base revealed that empirical studies and contributions from a variety of countries recently expanded the S-HRM literature. While earlier papers noted a scarcity of empirical research [7], we identified a number of empirical studies, particularly in the area of Green HRM. In terms of geographical distribution of the publications, these empirical studies that featured in the top cited and top co-cited lists were conducted in a variety of countries such as Brazil, China, Germany, Korea, Mexico, Palestine, Spain, and the US.

However, even though studies were conducted in a variety of countries, an analysis of the impact of the context on the implementation of S-HRM seems to be mostly missing from the literature. Study results are often reported as if the research findings are context-free. This has also been pointed out by Aust et al. [6], who lamented that the S-HRM literature

has so far largely ignored the influence of context (e.g., national culture, institutions, socio-political, and economic environment).

Co-citation analysis revealed that current conceptualizations of S-HRM have evolved from earlier concepts of strategic HRM and strategic management. Resource-based view and stakeholder theory were influential concepts that informed these earlier conceptualizations. The current definitions of sustainable HRM have challenged these traditional views by broadening the perspectives. Instead of the narrow focus on financial outcomes, the focus now includes triple bottom line outcomes. Additionally, instead of a narrower view on stakeholders directly impacted by an organization's activities, the stakeholders under consideration now include broader interests, including the collective interests of society and future generations.

An area of S-HRM research that appears to be still underdeveloped is the exploration of the 'paradox' aspect of sustainability [20], which addresses the complexity and ambiguity of the topic [5]. A number of authors have pointed out that sustainability research is often simplistic and idealistic, thinking of the triple bottom line as a win-win-win situation while ignoring the tensions between economic, social, and environmental considerations. Ehnert and Harry [7] posited that "for the majority of organizations it will not be so easy to create economic efficiency, ecological, social and human sustainability simultaneously without a fundamental change in their business strategy and organizational culture" (p. 224). Similarly, Voegtlin and Greenwood [89] mentioned the multiplicity of stakeholder interests that may not be easily reconciled. In a recently published literature review, Podgorodnichenko, Edgar, and McAndrew [31] pointed out a deficit in addressing the tensions and challenges present in the CSR-HRM literature.

This gap became apparent in our bibliometric review, as none of the top 20 highly cited or top 20 highly co-cited articles explore these 'paradox' aspects and tensions in greater detail, thus pointing to a lack of mainstream recognition of the complexity of the S-HRM field. The paradoxical nature of sustainable HRM tensions [8] deserves more recognition from scholars in the field and provides opportunities for further research.

5.2. Limitations

The review methodology used in this paper also constitutes its main limitation. Bibliometric analysis allows an analysis of 'meta-data' related to documents that constitute a research field, but it does not provide substantive insights into the findings of the papers or the quality of research. The current review is therefore useful to lay the ground for future research examining in greater depth the findings from studies of S-HRM.

A second limitation is linked to the ambiguity of the S-HRM construct as such. As has been pointed out earlier in this paper, the S-HRM literature is characterized by a variety of definitions and approaches and a lack of a coherent body of literature [5]. This contributes to an ambiguity as to the boundaries of the research field. We addressed this by using multiple searches with both broad and narrow search terms (broad search terms included 'human resource management' and narrower search terms included sub-categories of HRM such as 'recruitment', 'training', and 'development'). Nevertheless, there might be topics that were left out in the current review due to use of a different terminology. For example, the notable scarcity of papers related to the 'human' aspect of S-HRM may be partly due to the fact that papers that address this aspect may not always use the word 'sustainable' and were therefore not captured in our search. Topics such as workforce diversity, workplace safety, work stress, and their links to HRM potentially contribute to the S-HRM field in terms of making the workplace more sustainable, but unless the papers specifically used the term 'sustainable' or 'sustainability', they were not captured in our search. What can be regarded as a limitation of the current paper can provide opportunities for further research to explore the breadth of the field beyond the limitation of the search terms 'sustainable/sustainability'.

A third limitation derives from the use of the Scopus Index as a search database. Even though Scopus provides a good coverage of scholarly papers, it does not contain all

relevant documents in a certain research field. We can therefore conclude that the S-HRM literature base is possibly larger than what was captured in this review. To a certain extent, this limitation is counterbalanced by the fact that co-citation analysis not only analyses the documents identified as relevant in the search, but also analyses the reference lists of all these documents. Thus, the analysis captures a much greater set of documents that contribute directly or indirectly to the S-HRM literature.

6. Conclusions

This bibliometric review of the knowledge base on sustainable human resource management documented an emerging knowledge base of global scope with contributions from a variety of countries. Three invisible colleges emerged in the visual map of co-cited documents. These include Green HRM with a focus on environmental aspects of sustainability, CSR, and S-HRM with a focus on analyzing all three aspects of the triple bottom line. Co-citation analysis revealed that the literature on S-HRM has built on and challenged earlier concepts of strategic HRM and strategic management. Resource-based view and stakeholder theory were influential concepts. Document analyses identified that this emerging literature on S-HRM is heavily weighted towards environmental concerns. The implications for future research include greater attention on the contributions that HRM makes to the human and social aspects of sustainability. Additionally, the field would benefit from more contributions with a multidimensional focus on sustainability instead of a one- or two-dimensional focus, as well as contributions which explore the paradox aspect of S-HRM. Future bibliometric reviews might also benefit from including document searches in other databases with relevant S-HRM publications.

We end our review with a quote from Westerman et al. [30] (p. 4), who remind us that sustainable HRM is the "most complex challenge ever attempted in the HR discipline [and the] most important endeavour we have undertaken as scholars [for the] health of our planet for future generations".

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