



Sustainable entrepreneurship: Review of its evolution and new trends

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ARTICLE INFO

Article history:

Received 24 April 2019

Received in revised form

20 November 2019

Accepted 14 December 2019

Available online 19 December 2019

Handling editor: Mattias Lindahl

Keywords:

Sustainable entrepreneurship

Sustainopreneurship

Bibliometric analysis

Evolution

Research trends

ABSTRACT

Entrepreneurship has been recognized as a mechanism with which to generate economic benefits. However, due to the emergence of the concept of sustainable development as a pressing issue that is affecting the current global system, it has been pointed out that entrepreneurship should not be based solely on generating wealth. This brought about the emergence of the sustainable entrepreneurship notion which has received rapidly increasing attention in the last decade. This proliferation of studies has resulted in a lack of a theoretical framework, so this field needs to be analyzed, organized and synthesized to bring clarity. The aim of this study is to provide a bibliometric analysis of the status of the field, recognize main topics from existing research and establish future challenges for research. The results based on a sample of 216 articles show that the number of published articles and citations has grown constantly, especially in the last two years. Through bibliometric performance indicators, the most productive and relevant journals, countries, institutions and authors are presented. Moreover, through graphic mapping of strategic diagrams, this study identifies the most significant research tendencies enabling the proposal of several future research directions. The findings of this research can be useful for novel and senior sustainable entrepreneurship researchers, as it contributes to bringing clarity to this field by providing a complementary overview of the evolution and current status, as well as to finding a comprehensive, synthesized and organized summary of the diverse definitions, perspectives and research trends.

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1. Introduction

In the last decade, entrepreneurship has been considered as a solution for social inequality and environmental degradation rather than a possible cause of them (Muñoz and Cohen, 2018). This fact attracted scholars' attention who, developing the connection between traditional entrepreneurship, society and the environment, established a new type of entrepreneurial activity, named sustainable entrepreneurship (SE) (Cohen and Winn, 2007; Gibbs, 2006) or sustaintopreneurship (Aghelie et al., 2016). According to Shepherd and Patzelt (2011), the objective of SE is to "preserve nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society".

Related terms have been linked to SE, such as Social Entrepreneurship or Environmental Entrepreneurship, however SE is seen as a unique perspective that combines the creation of environmental, social and economic values, which focuses on ensuring the well-being of future generations (Anderson, 1998).

On the theoretical level, SE has received increased attention from scholars, which has led to the emergence of special issues of scientific journals, such as *Greener Management International Journal*, *Sustainability*, *International Journal of Entrepreneurial Behavior & Research* or *the Journal of Business Venturing*. Moreover, dedicated journals on the topic have appeared (Muñoz and Cohen, 2018), such as the *Journal of Asia Entrepreneurship and Sustainability* or *Entrepreneurship and Sustainability Issues*. Furthermore, one of the leading journals in this field, *Journal of Cleaner of Production*, published 20 articles that refer to this topic between 2002 and 2018. Finally, recent literature reviews (Fellnhofer et al., 2014; Gast et al., 2017; Kraus et al., 2018; Muñoz and Cohen, 2018) call for papers that help to bring clarity to SE, arguing that this topic of growing interest is not fully understood and that it needs to be analyzed, organized and synthesized.

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On the practical level, SE has received growing importance on the part of different actors, such as international institutions, firms and universities. The adoption of the '2030 Development Agenda' approved in 2015 by the United Nations (UN) assembly provides a framework for collaboration on a global scale across sectors and governance levels, that has favored the increase of institutional support programs for the implementation of sustainable entrepreneurship initiatives by companies (Schaltegger et al., 2018). In particular, sustainable entrepreneurship initiatives in sectors such as agribusiness, construction and energy are playing a prominent role in increasing interest in analyzing the effectiveness of the changes involved in production policies of these sectors from environmental and hygienic perspectives as well as in financial analysis (Hašková, 2017; Maroušek, 2013; Maroušek et al., 2018, 2019). On the other hand, various universities have begun to offer entire MBA (University of Vermont) or MSc (University of Bath) programs dedicated to SE. Moreover, some academic centers in SE have appeared, such as the *Centre for Sustainable Entrepreneurship* of the University of Groningen.

As it is almost 20 years since the first manuscript on SE emerged in the *Journal of Organizational Change Management*, it is time to evaluate the development of the field, to identify the main actors (e.g. countries, institution, authors), to assess the past and suggest future research directions. Especially considering that SE has been receiving considerable recognition from academics, practitioners and institutions in the last ten years (Sarango-Lalangui et al., 2018) across a growing range of disciplines and sectors (Breuer et al., 2018), review studies (e.g. systematic analysis, meta-analysis, bibliometric analysis) must be carried out periodically to highlight progress and limitations, to stimulate reflections on future research and motivate further progress. Levinsohn (2013) has systematically reviewed the manuscripts on SE published during the first decade of the 21st century, providing a first overview of themes explored until then. Another four review studies have more recently addressed specific aspects of this field. Aghelie et al. (2016) performs a systematic analysis of 43 articles on SE, however they do not clearly explain either the terms used to search for articles, or the database(s) used, nor the method to be followed, therefore it is not a reproducible work. Gast et al. (2017), in a systematic review of 114 articles published between 1996 and 2015, identified and proposed future research directions through an iterative identification of overarching patterns and clusters of recurrent themes resulting in six main research streams. However, the emphasis of the study lay on the creation of an integrative SE framework based on the core principles of the "classic" entrepreneurship process; hence the six identified clusters were focused on the mirror of the entrepreneurial process.

Muñoz and Cohen (2018) addressed a systematic review of 81 articles (published between 1995 and 2015) to detect the main challenges based on boundary definition and delineation of the main features of SE, however they restricted the search to ABS (Association of Business Schools) ranked journals and two specialized journals, these being *Greener Management International* and *Journal of Cleaner Production*, leaving aside other highly relevant journals from this field. Furthermore, bibliometric analyses have been sparsely implemented to analyze the SE field. The only bibliometric analysis on this field (Sarango-Lalangui et al., 2018) focuses solely on a citation analysis of authors and journals, eschewing other bibliometric performance indicators such as the h-Index. Besides, it is relevant to broaden the analysis to countries, affiliation institutions or, even more importantly, to analyze the most used keywords and the research trends within this field. Moreover, the bibliometric analysis conducted by Sarango-Lalangui et al. (2018) lacks maps to analyze spatial representations of how authors, countries, institutions and keywords relate to each other.

To the best of our knowledge, none of the existing reviews have provided a complete picture of the main agents nor a co-word analysis

of the main research topics and emerging research themes that help to bring clarity to this field. Therefore, to address this gap in the current literature this research conducts a bibliometric analysis to assess the status of the field, identify the principal academic agents that are constantly developing this field, recognize main topics from existing research and establish future challenges for research in this field.

Bibliometric analysis consists of two techniques; bibliometric performance indicators and scientific mapping. Bibliometric performance indicators allow the illustration of the performance of authors, journals, institutions and countries, i.e. the number of articles, citations, average citations per article, h-index, etc., while scientific mapping allows linking networks between countries, institutions, journals, authors and keywords to be visualized. In addition, it allows the detection of researched themes and emerging research trends to be detected. According to Small (1999), the complementing capacity of both techniques enable an understanding of how documents, authors, keywords, disciplines or fields relate to each other. It could be said that bibliometric analyses are retrospective in nature because the use of secondary data. Nowadays, more and more academics (Niñerola et al., 2019; Zhang et al., 2019) are highlighting the importance of this type of research, because they argue that results allow useful information to be created by analyzing scientific activity and establishing future research lines. Furthermore, Zhang et al. (2017) postulate that bibliometric analyses make it possible to study bibliographical material that fosters the discovery, organization and examination of information within a specific topic or field. For this study, authors decided to select two complementary tools, VOSviewer and SciMAT. VOSviewer is a scientifically accepted tool for the visualization of graphical representations of maps that help to interpret and understand the interaction between countries, institutions, journals, authors and keywords (Castillo-Vergara et al., 2018; Cobo et al., 2011). SciMAT is recognized as software for the identification of associations and interactions between previously researched themes and emerging research trends (Murgado-Armenteros et al., 2015).

Thus, by means of a bibliometric analysis of 216 articles, this study contributes to the literature on SE in different ways. First, it provides a complete overview of the evolution of this field from 2002 to 2018, by showing the principal performance indicators of journals, countries, institutions, authors and papers. Second, through graphic mapping this research illustrates the main collaboration networks between countries and authors. As a third contribution, strategic diagrams based on co-word analysis enable the establishment of the main researched themes and emerging research topics in this field. In this sense, it presents a broad review study that complements the existing reviews on SE, by extending the period of analysis and providing a new focus for research. The findings of this research can be useful for both, novel and senior researchers to broaden their knowledge about SE research. They will be able to find a complete overview about the origin, evolution and current status of SE research, as well as a synthesized and organized summary of the diverse definitions, perspectives and research trends of this field. Likewise, they will be able to have a complete picture of the global research on SE and how it is distributed between subject areas, journals, countries, institutions and authors. Finally, readers will find this study significant as it presents several proposals for future research opportunities.

2. Delineating sustainable entrepreneurship

Traditionally, entrepreneurship has been studied, analyzed and implemented as a mechanism to generate a form of self-employment that is capable of generating economic benefits (Segal et al., 2005) or as one of the ways to generate workplaces (Sarango-Lalangui et al., 2018). In other words, entrepreneurship has been approached as a way to stimulate economic development

(Kirzner, 1973), but issues relating to society and environment were overlooked (Sarango-Lalangui et al., 2018). However, the growing importance lent to environmental issues on the part of governments, NGO's, researchers and firms (Aghelie et al., 2016) and the emergence of the concept of sustainable development (Kerlin, 2006) have caused several academics (Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011) to affirm that entrepreneurship should not be based solely on generating wealth. Furthermore, according to some scholars (Dean and McMullen, 2007; Shepherd and Patzelt, 2011), entrepreneurship is a vehicle that can lead economic sectors towards sustainable development.

Schaltegger and Wagner (2011) postulate that entrepreneurship should focus on activities with commercial, social and environmental purposes that respond to the needs and requirements of today's economy. In addition, Shepherd and Patzelt (2011) argue that if entrepreneurs want to create a successful business that contributes to development, they must include and adapt sustainability within their business strategy. Consequently, in the last decade interest on the part of companies and entrepreneurs to understand the real impact of their business on the environment and society has increased (Aghelie et al., 2016). Because of this, the traditional concept of entrepreneurship focusing on value creation in terms of economic results has been extended to address non-economic benefits as well (Shepherd and Patzelt, 2011; Urbaniec, 2018).

As a result, some researchers (Cohen and Winn, 2007; O'Neill Jr. et al., 2006) began to pay greater attention to the connection between sustainable development and entrepreneurship, which has led to the concept of sustainable entrepreneurship (SE) (Muñoz and Cohen, 2018) or also called sustainopreneurship (Aghelie et al., 2016). SE is based on and related to the triple bottom line (TBL), i.e. (1) environmental aspects, taking into consideration the long-term protection and reduction of negative effects, (2), social aspects, where attention to customers, stakeholders, partners, workers and community is given and (3) economic aspects, which rely on economic performance (Aghelie et al., 2016; Urbaniec, 2018). In this regard, nowadays sustainable entrepreneurs are thought to be agents of change who are committed to seeking a balance between the economic viability, social welfare and environmental protection (Belz and Binder, 2017; Muñoz and Dimov, 2015).

As occurs in several emerging issues, SE suffers from a proliferation of different definitions, resulting in the lack of a theoretical framework accented in the literature (Sarango-Lalangui et al., 2018). This variety of definitions is mainly caused by the two main approaches under which SE is studied (Appendix A shows a compilation and classification of the various definitions that this field has received). On the one hand, researchers influenced by the sustainable management perspective, highlight the importance of the concepts of the TBL and sustainable development, while entrepreneurial activities are subordinate to them (Crals and Vereeck, 2005; Lans et al., 2014). This academic perspective establishes that SE is not only focused on exploiting market opportunities but it also transcends beyond, even going so far as to analyze in a more conscious way the real impact on the economic, social and environmental spheres that companies have on their territories (Urbaniec, 2018). To them, entrepreneurs should consider sustainable development as a unique business opportunity (Crals and Vereeck, 2005) that helps transform the current economy into a sustainable economy, creating solutions for various social and environmental aspects (Schaltegger and Wagner, 2011). This approach mainly refers to SE as *"the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce, their families, the local and global community as well as future generations"* (Crals and Vereeck, 2005).

On the other hand, scholars influenced by the entrepreneurship theory approach see SE as a combination of the TBL with the entrepreneurship process perspective (Pacheco et al., 2010; Patzelt and Shepherd, 2011). These academics highlight the importance of the relationship between entrepreneurs and opportunities, arguing that entrepreneurs are wholly aware of the impact their businesses have on the environment (Belz and Binder, 2017; Dean and McMullen, 2007). Moreover, this SE approach states that sustainable development is the basis for creating sustainable business models since entrepreneurs can recognize long-term entrepreneurial opportunities (Sarango-Lalangui et al., 2018). The most cited definition (Sarango-Lalangui et al., 2018) of this approach considers SE as *"the examination of how opportunities to bring into existence 'future' goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences"* (Cohen and Winn, 2007, p. 35).

Debate about the terminology related to SE exists in earlier research, partly due to its novelty as an academic concept (Kraus et al., 2017). However, the theoretical perspectives on sustainability and sustainable development are more evolved and comprehensible. For instance, sustainable development is regarded as *"development that meets the need of the present generation without compromising the ability of future generation to meet their own needs"* (World Commission on Environment and Development, 1987). In this vein, there is a general consensus on the three main dimensions of sustainability, namely People, Planet and Profit or the TBL (Elkington, 1994; Hapenciuc et al., 2015). Therefore, entrepreneurs acting sustainably are understood as being able to serve the needs of the current generation without causing danger to future generations and with the synthesis of economic, social and environmental pillars. In this vein, policy such as the United Nations initiative is aimed at encouraging entrepreneurs to deliver social and environmental benefits through responsible actions (Larsson et al., 2016).

Under the aforementioned sustainability paradigm, new terms have appeared such as green entrepreneurship, environmental entrepreneurship, eco-entrepreneurship, social entrepreneurship as well as corporate social responsibility (CSR), in an attempt to provide a response to the question of how both start-ups and incumbents can act more responsibly (Kraus et al., 2017). There are differences between these terms. Environmental, ecological entrepreneurship and eco-entrepreneurship could be bundled together under the term green entrepreneurship, focusing primarily on environmental challenges or areas. In doing so, they are aimed at obtaining economic profit through an environmental lens (Schaefer et al., 2015; Schaltegger, 2002). By contrast, in social entrepreneurship, the core of the business is the creation of social value or value for people and communities, such as helping marginalized and disadvantaged groups (Schaefer et al., 2015). In this way, profit is deemed as a means to the social end, including both profit-oriented and not-for-profit firms (Nikolaou et al., 2018).

Moreover, there exists confusion between CSR and SE. From our point of view, CSR is understood in a different manner from SE. CSR could be regarded as the way in which firms articulate their strategic plans regarding sustainability, although the main goal is to obtain economic profit and any social and environmental actions are merely accompanying the core of the business. Meanwhile, in sustainable entrepreneurship, the core business focuses on the social, environmental and economic performance (Greco and De Jong, 2017). In other words, CSR activities involve carrying out (superficial) "reparations" or "corrections" of firm activities, without incorporating sustainable practices in the core business, while SE refers to implementing sustainable principles as an integral component of business value creation (Hansen and Schaltegger, 2013). Thus, in this study, SE is regarded as a unique perspective that combines environmental,

societal and economic issues, grounded on the TBL as part of the core business of a company.

3. Methodology

As stated above, this research adopts bibliometric analysis technique as the method to conduct this review. This method has been widely used to illustrate and identify the key elements (countries, institutions, authors, documents, etc.) in different fields of research (Cobo et al., 2011; Moed et al., 1995; Morris and Van der Veer Martens, 2009). As with previous bibliometric analysis (Capobianco-Uriarte et al., 2019; Castillo-Vergara et al., 2018), this paper follows the following five steps: (1) definition of the field of study; (2) database selection, (3) research criteria adjustment, (4) codification of recovered material and (5) examination of the information. Fig. 1 summarizes the followed methodology. Bibliometric analyses are carried out mostly with data retrieved from two major databases, Scopus and Web of Science (WoS). Due to the fact that almost 84% of the articles of WoS can be found in Scopus and WoS database includes fewer indexed journals than Scopus (Mongeon and Paul-Hus, 2016), this research adopts the Scopus database as a sample in order to reduce the risk of overlooking documents during the search.

The following parameters were used to retrieve the search: “TITLE-ABSTRACT-KEYWORD (“sustainab* entrepreneur*” OR sustainopreneurship). As stated above, in our view and based on previous review studies (e.g. Muñoz and Cohen, 2018), SE is a unique concept that encompasses the presence of individuals or firms pursuing entrepreneurial opportunities while simultaneously seeking the creation of environmental, social and economic value. Therefore, we do not consider any related term as we consider that they are not within the core focus of this research according to the arguments given in the above sections. The search was conducted in March 2019 and the selected study period was 2002–2018 since the first paper included in Scopus that holds the search parameter

dates from 2002. Only papers up to 2018 were included in order to compare complete years. The search was limited to articles, excluding reviews to avoid duplication of documents. The final sample consisted of 216 articles (see Appendix B). Taking into consideration that citations from these articles are used in this study, citations received up until March 1, 2019 were included.

Data was downloaded in csv and ris formats and processed with Excel (version 2013) and SciMAT (v1.1.04). Once the data was treated, the analysis was carried out using two complementary tools, VOSviewer and SciMAT. VOSviewer (van Eck and Waltman, 2017; Waltman and van Eck, 2012) is a powerful tool that enables scientific maps to be illustrated, visualized and discovered (van Eck et al., 2010). It also allows graphical representations of maps to be presented that facilitate the interpretation and understanding of linking networks between countries, institutions, journals, authors and keywords (Castillo-Vergara et al., 2018; Cobo et al., 2011). SciMAT helps to create scientific maps in a longitudinal framework (Castillo-Vergara et al., 2018) based on certain bibliometric performance indicators such as h-Index (Hirsch, 2005) and co-word analysis (Callon et al., 1983). The validity of SciMAT has improved since it used co-word analysis, a very well established content analysis technique that allows the examination of the co-occurrences of authors keywords (Callon et al., 1983). Furthermore, this technique is used to recognize associations and interactions between researched themes and emerging research trends (Callon et al., 1991). Moreover, SciMAT is a widely used tool in diverse scientific disciplines, such as health (Moral-Munoz et al., 2019), computer science (Wang et al., 2018), international business (Castillo-Vergara et al., 2018) and marketing (Murgado-Armenteros et al., 2015).

The main advantage of SciMAT is that it helps to identify which thematic areas (based on author keywords) have received most attention from researchers within a specific field through the generation of strategic diagrams; i.e. it makes it possible to visualize the evolution of research trends over diverse periods of time when

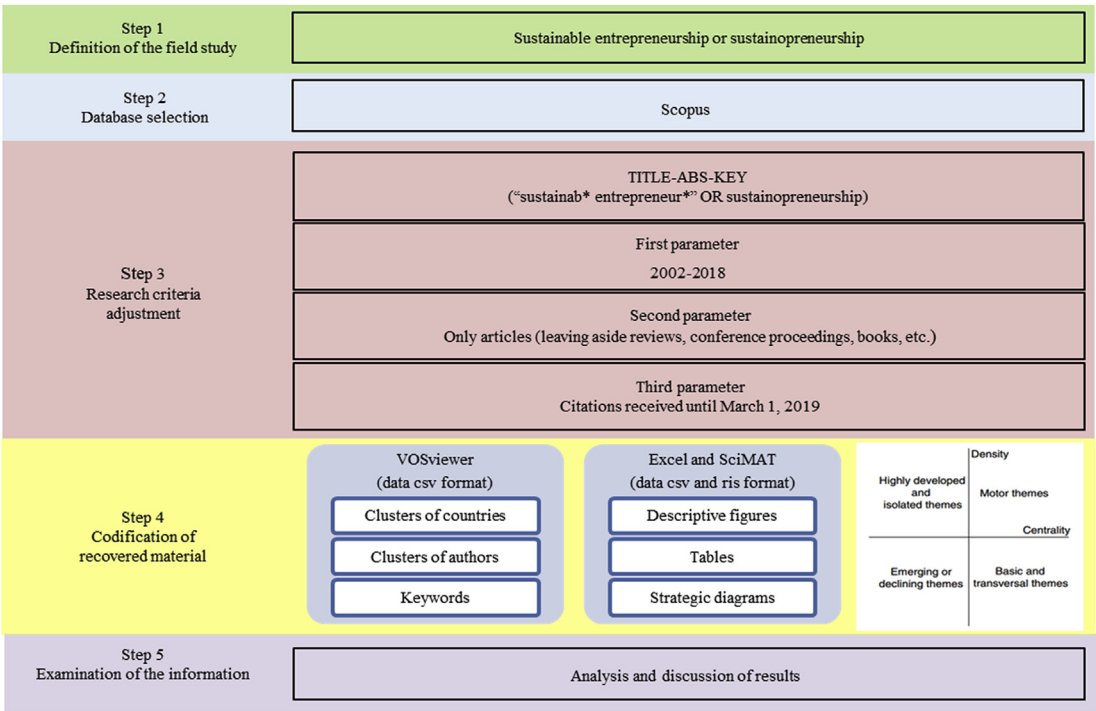


Fig. 1. Methodology flowchart.
Source: own elaboration.

measuring the density and centrality of each topic (Cobo et al., 2015). SciMAT density and centrality measures are based on Callon et al.'s. (1991) study. Callon's centrality measures the degree of interaction of a network with other networks, and it can be understood as the external cohesion of the network. While Callon's density measures the internal strength of the network and can be understood as the internal cohesion of the network (for further explanation of these measures please see Callon et al., 1991 and Cobo et al., 2011). Density and centrality in SciMAT varies between 0.00 and 1.00; the closer the value is to 1.00 means higher centrality and intensity. Thus, strategic diagrams of SciMAT are mapped in two-dimensions with four quadrants (see Step 4 of Fig. 1). The themes that appear in the upper right quadrant are denominated as motor themes, because they present a high density and a strong centrality. This means that these topics are well developed and relevant in the structure of a field. The lower right quadrant encompasses the basic, general and cross-cutting themes, i.e. they are important however they should continue to develop. Topics located in the lower left quadrant represent themes that possess low centrality and low density, so they are mainly emerging or disappearing themes. Topics that appear in the upper left quadrant are marginal to the field, because they have well-developed internal links but irrelevant external links. Furthermore, the strategic diagrams include a third dimension; some spheres appear within the quadrants (representing the topics) and their volumes represent one of these three indicators, (1) the h-Index of each topic, (2) number of citations or (3) number of documents (Murgado-Armenteros et al., 2015).

4. Results and discussion

The scientific production research of a specific field is relevant for understanding the evolution of the literature, detecting research trends and organizing past research in order to suggest future research lines. It enables an overview to be had of different aspects of a field. In the interests of achieving a better analysis, this section is divided in two sub-sections. The first sub-section establishes the descriptive results, such as: scientific production evolution in terms of published papers and citations, distribution of scientific production by subject areas and journals, most productive countries, institutions and authors and the most cited papers. The second sub-section analyses the content results by establishing the most relevant trend topics within SE, identifying which of them are well-established, which are basic but have to continue to develop and which are in a nascent stage. Table 1 shows a summary of the coded data used to develop this bibliometric study.

4.1. Descriptive analysis

4.1.1. Evolution of scientific production

Fig. 2 and Table 2 show that SE has been an emerging issue since 2009 and that the number of published articles has been increasing constantly since 2012. In the first ten years of SE research just 21% of total articles were published, while just in the last year 33% of

papers were published. Fig. 2 also illustrates that citations and published articles have grown in parallel. These results are consistent with previous studies (Aghelie et al., 2016; Sarango-Lalangui et al., 2018) which established that the first years had low productivity. It should be noted that according to the study of Aghelie et al. (2016) the first paper published in this field was by Pastakia in 1998. Table 2 also shows some of the main characteristics of published papers such as average citations per year, number of authors per year, average number of authors per articles, number of journals that published at least 1 article in a specific year and the number of countries that published at least 1 article in a specific year. As can be seen, 2018 is the most productive year with 71 published articles and the year with most citations with 1376. This table shows that the average citations per article has also increased exponentially since 2005 and that every year more and more authors are publishing about SE. Regarding the average number of authors per year, it could be said that the first years of this field (2002–2008) were characterized by a low number of authors per articles. However, since 2009 this average has increased, demonstrating that there are more and more collaborations between researchers seeking to address this issue. Moreover, there is a constant growth in the number of journals and countries publishing on this subject. In 2018 there were 31 different journals and 36 different countries that published at least one paper related to SE research.

4.1.2. Distribution of scientific production

Fig. 3 shows the principal subject areas under which the Scopus database classifies the scientific production on SE. The most relevant subject area is *Business, Management and Accounting* with 29% followed by *Social Sciences* and *Environmental Science* with 18% each. Another two notable subject areas are *Energy* with 12% and *Economics, Econometrics and Finance* with 10%. These five areas encompass 87% of the total published papers, while 11 other disciplines do not account for more than 13% of published articles. As stated by previous studies (Belz and Binder, 2017; Sarango-Lalangui et al., 2018; Thompson et al., 2011), SE research began with particular attention being paid by researchers of sustainable management and entrepreneurial activity, however nowadays this field is mainstream and receives attention from academics from many different disciplines. These statements are supported by our results.

As presented in Table 1, SE research was published in 107 different Scopus journals from 2002 to 2018. Similarly, Sarango-Lalangui et al. (2018), using the WoS database also established that SE research can be found in more than 100 journals. Table 3 shows the ten most productive journals on SE during the period under study. Sarango-Lalangui et al. (2018) argue that until January 2018 the five most productive journals are: *Journal of Cleaner Production*, *Sustainability*, *Business Strategy and The Environment*, *Journal of Business Venturing* and *Journal of Business Ethics*. Four of the five journals also appear in our study. However Sarango-Lalangui

Table 1
Summary of used data.

Data	SE research
Number of articles	216
Number of journals	107
Number of authors	496
Number of countries	60
Number of citations	4114

Source: own elaboration based on Scopus 2019.

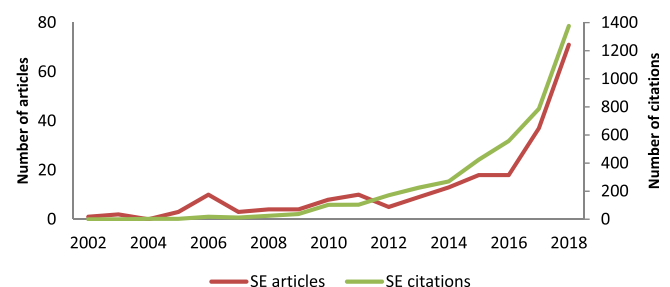


Fig. 2. Evolution of published articles and citations from 2002 to 2018. Source: own elaboration based on Scopus 2019.

Table 2
The main characteristics of the articles on sustainable entrepreneurship from 2002 to 2018.

Year	A	C	C/A	AU	AUA	JA	COA
2002	1	0	0.00	1	1.00	1	1
2003	2	0	0.00	4	2.00	2	2
2004	0	3	1.00	0	0.00	0	0
2005	3	3	1.00	7	2.33	3	3
2006	10	18	1.50	17	1.70	6	8
2007	3	12	1.89	5	1.67	2	3
2008	4	25	2.65	7	1.75	4	4
2009	4	37	3.63	15	3.75	4	7
2010	8	103	5.74	13	1.63	5	8
2011	10	104	6.78	19	1.90	8	9
2012	5	171	9.52	11	2.20	5	5
2013	9	225	11.88	21	2.33	9	10
2014	13	269	13.47	46	3.54	13	16
2015	18	424	15.49	56	3.11	16	18
2016	18	558	18.07	54	3.00	14	18
2017	37	786	18.88	101	2.73	25	27
2018	71	1376	19.05	160	2.25	31	36

A: Number of articles published per year; C: Number of citations per year; C/A: Average number of citations per article (citation total since 2002/total of articles since 2002); AU: Number of authors per year; AUA: Number of authors that published at least 1 article in a specific year; JA: Number of journals that published at least 1 article in a specific year; COA: Number of countries that published at least 1 article in a specific year. Source: own elaboration based on Scopus 2019.

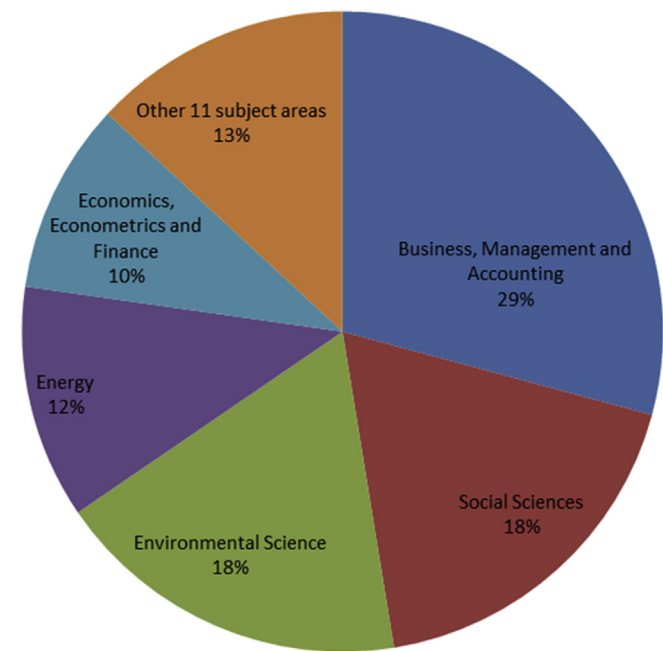


Fig. 3. Subject areas that stand out on SE research.
Source: own elaboration based on Scopus 2019.

et al. (2018) postulate the *Journal of Cleaner Production* as being the most productive, while this study ranks *Sustainability* in first place with 26 published papers. This mismatch may mainly be explained by three reasons. First, Sarango-Lalangui et al. (2018) used a different database, in this case Web of Science (WoS). Second, they established a wider parameter of keywords for the selection of studies since their objective was a little different to ours. Third, the time period used is different, from 1992 to January 2018. Table 3 details other bibliometric indicators, such as citations, average citations per articles, year of first publication, year of last publication and h-Index. The journal with the most citations (C) is the *Journal of Business Venturing* with 1475 followed by *Business*

Strategy and the Environment and *Journal of Cleaner Production* with 745 and 383, respectively. Regarding the average citations per article (C/A) the *Journal of Business Venturing* again appears at the top with 184.38 followed by *Business Strategy and The Environment* with 82.78 and *Greener Management International* with 51.60 citations per article. Another important factor worth noting is that five of the ten most productive journals have begun publishing SE research in the last four years (2015–2018) which could suggest that an increasing number of journals are willing to publish on this subject. Accordingly, in order to diminish the effect of the years of publication, the indicator average number of citations per articles since the year of the first published article (C/Y) is presented. Regarding this indicator, it can be observed that the *Journal of Business Venturing* continues to lead with 122.92 citations per year, while *Business Strategy and The Environment* with 57.31 is in second place, but in third place is the journal *Sustainability* with 29 citations per year.

Regarding the h-Index there are four major journals, these are: *Sustainability*, *Journal of Cleaner Production*, *Business Strategy and The Environment* and *Journal of Business Venturing*, all with an h-Index of 7. Finally, there are two more aspects worth mentioning. First of all, that the top ten journals are from Europe and the United States. In fact, eight are from Europe and two from the United States, demonstrating that journals from these regions are at the forefront of SE research. And second, those journals not only represent academic areas such as entrepreneurship and environment but journals from other disciplines such as international business and international management can also be found.

4.1.3. Countries, institutions, authors and papers

As stated in Table 1 and illustrated in Fig. 4, sixty different countries have published articles about SE. However, as can be seen in Table 4 the majority of published papers are concentrated in a few countries. It has to be clarified that the same paper could represent more than one country, because countries are given by the affiliation institutions of academics. As expected, English-speaking countries (the United Kingdom with 27 and the United States with 26 articles) and countries with very high proficiency in English language skills according to the EF English Proficiency Index 2018 (Germany with 26 and Netherlands with 23 papers) are most strongly represented. In addition, the higher concentration of SE research could also be explained by arguing that the 10 countries shown in Table 4 are among the first 25 places of the ranking of countries with more expenditure on research and development in real terms (United Nations Educational Scientific and Cultural Organization, 2018).

Taking into account the number of articles per million inhabitants (AH), Netherlands is in first place with 1.34, while the United Kingdom appears in second place with 0.41. Spain appears in third place with 0.39. Analyzing the total number of citations (C) it can be seen that the United States has the highest number with 1345 followed by Germany and Canada with 996 and 638, respectively. This table also shows the average citations per article (C/A). If this variable is considered, Canada comes first with 63.80, followed by the United States with 51.73 and Germany with 38.31. This indicator reveals that the publications of these countries have a greater standing, while other countries such as Malaysia, India, France and Spain have the least number of citations per article, with Spain being a particular case as the first published paper (1st A) dates from 2016. Considering the h-Index, the United States appears in first place again with an h-index of 14, followed by the United Kingdom with 12 and Germany and Netherlands with 10 each. Also, it is worth mentioning that the top 10 most productive countries continued publishing papers related to SE in 2018 and that four of them have begun publishing about it in the last nine years (2010–2018). Finally, it should be highlighted that the most

Table 3

The top 10 most productive journals on SE research from 2002 to 2018.

Journal	A	COU	C	C/A	1st A	Last A	C/Y	h-Index
Sustainability	26	Switzerland	116	4.46	2015	2018	29.00	7
Journal of Cleaner Production	20	Netherlands	383	19.15	2002	2018	22.53	7
Business Strategy and The Environment	9	United States	745	82.78	2006	2018	57.31	7
International Journal of Entrepreneurial Behaviour and Research	8	United Kingdom	28	3.50	2018	2018	28.00	4
Journal of Business Venturing	8	Netherlands	1,475	184.38	2007	2018	122.92	7
International Journal of Entrepreneurship and Small Business	7	United Kingdom	14	2.00	2011	2017	1.75	2
Greener Management International	5	United Kingdom	258	51.60	2006	2006	19.85	5
International Journal of Entrepreneurial Venturing	5	Switzerland	7	1.40	2018	2018	7.00	2
Entrepreneurship and Sustainability Issues	4	Lithuania	19	4.75	2018	2018	19.00	3
Organization and Environment	4	United States	83	20.75	2015	2018	20.75	3

A: Number of total articles; COU: Countries; C: Number of citations for all articles; C/A: Average citation per article; 1st A: Year of first published article; Last A: Year of last published article; C/Y: Average number of citations per year since the 1st A. Source: own elaboration based on Scopus 2019.

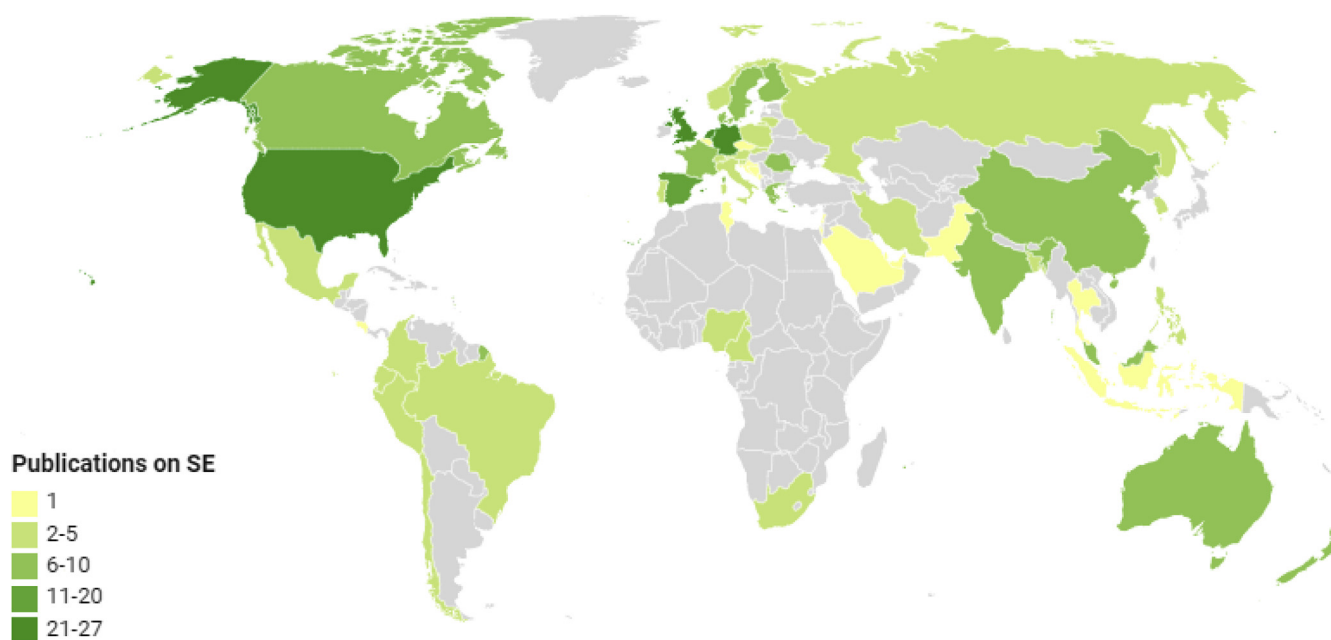


Fig. 4. Worldwide publications on SE.
Source: own elaboration with Datawrapper.

Table 4

The top 10 most productive countries on SE research from 2002 to 2018.

Country	A	AH	C	C/A	h-Index	1st A	Last A
United Kingdom	27	0.41	626	23.19	12	2006	2018
Germany	26	0.31	996	38.31	10	2010	2018
United States	26	0.08	1,345	51.73	14	2003	2018
Netherlands	23	1.34	358	15.57	10	2002	2018
Spain	18	0.39	65	3.61	5	2016	2018
Canada	10	0.27	638	63.80	5	2006	2018
France	10	0.15	51	5.10	4	2011	2018
India	9	0.01	20	2.22	3	2006	2018
Australia	8	0.32	78	9.75	3	2006	2018
Malaysia	8	0.25	12	1.50	2	2011	2018

A: Number of total articles; AH: Number of articles per 1 million inhabitants; C: Number of citations for all articles; C/A: Average citation per article; 1st A: Year of first published article; Last A: Year of last published article. Source: own elaboration based on Scopus 2019.

productive countries come from different regions of the world, such as Europe, North America and Southeast Asia. This diversity might be a strong contributing factor to the growth of this topic.

Furthermore, Fig. 5 shows a network that illustrates the international collaboration between the twenty principal countries that

published articles relating to SE. The size of circles varies because they reflect the number of published articles per country, while the color of each one of them corresponds to the cluster that encompasses each of the diverse country groups. Five different clusters can be observed. The first one (blue) is led by the United Kingdom which presents a strong collaborative link with Spain, Portugal and Romania. The second group (red) is led by the United States and the main collaborative countries are Canada and some Asian countries such as India and Malaysia. The third cluster (yellow) is led by Germany which has close collaborations with countries such as Finland and Austria. The purple cluster has Netherlands as its leader. The main collaborating countries are France and Lithuania. Finally, the fifth cluster (green) encompasses other European countries such as Denmark, Greece, Italy and Sweden without there being a clear leader.

Table 5 shows the main characteristics of the ten most productive institutions on SE research from 2002 to 2018. These institutions are located in 5 countries. Germany has three institutions, while Spain, the United Kingdom and Netherlands two and the United States one. The *Leuphana Universität Lüneburg* takes the first place with 7 articles. This is followed by the *Wageningen University and Research Centre* and the *University of Leeds* with 6

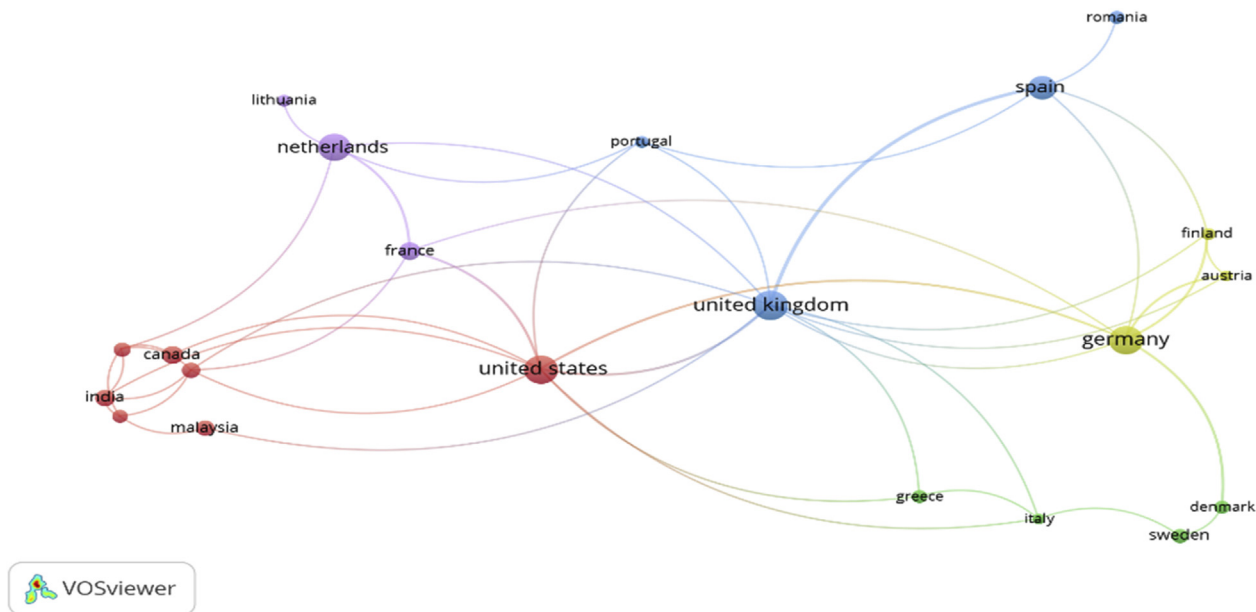


Fig. 5. Network of the co-authorship-based cooperation between countries from 2002 to 2018.
Source: data from Scopus (2019) generated using VOSviewer.

papers each, while the other seven centers have 4 articles. If we analyze the total number of citations (C), the *Julius-Maximilians-Universität Würzburg* takes the first position with 505, which is also the institution with the highest average citations per article (C/A) with 126.25 citations per article. Another two relevant institutions with a high number of citations and citations per articles are the *Leuphana Universität Lüneburg* and the *University of Leeds* which are in second and third place respectively for each indicator. It is also important to highlight that two German universities (leaving aside the *Universität Oldenburg*) encompass almost 1000 citations which shows their relevance on the development on SE research. The *University of Leeds* stands out as the institution with the highest h-Index. Finally, it is worth noting that four of these ten institutions did not begin publishing articles relating to SE until 2017, highlighting the growing interest in this topic in various universities around the world.

The main characteristics of the ten most productive authors on SE are displayed in Table 6. This field, being still young, possesses only five authors that have more than three published papers. These ten authors represent nine institutions, eight countries and three regions, mainly Europe, but also North America and South America. It is necessary to clarify that Cohen B. represents the *EADA Business School* in four papers, while in the other three he represents other institutions. It is the same case for Muñoz P., who

represents the *Universidad del Desarrollo* in two papers, while in the other two he represents different centers. It is for this reason that these two institutions (*EADA Business School* and *Universidad del Desarrollo*) do not appear in the list of institutions (Table 5) with the highest scientific production on SE.

The author with the most published articles is Cohen B. with 7 followed by Muñoz P. with 6. Cohen B. is also the author with most citations (C), however the author with most citations per article is Wagner M. with 165.67 followed by Schaltegger S. with 103.00. According to the study of Sarango-Lalangui et al. (2018), who use different parameters to conduct the research, the three most productive authors are Shepherd D., Shrivastava P. and York J. with four articles. Although our results showed some authors with more than four papers we also found in our research Shepherd D. and Shrivastava P. just with two published articles. However, Sarango-Lalangui et al. (2018) also highlight authors such as Wagner M., Schaltegger S. and Cohen B. as some of the most cited authors. Regarding these results and in concordance with Sarango-Lalangui et al. (2018), it can be stated that these academics (Wagner M., Schaltegger S. and Cohen B.) are the three most relevant authors for the emergence and development of SE research. Finally, it is important to mention that five of these ten authors began publishing on this topic in the last five years (2014–2018). This is an important factor because it indicates that new academics are being

Table 5
The top 10 most productive institutions on SE research from 2002 to 2018.

Institution	Country	A	C	C/A	1st A	Last A	h-Index
Leuphana Universität Lüneburg	Germany	7	419	59.86	2011	2018	4
Wageningen University and Research Centre	Netherlands	6	89	14.83	2014	2018	3
University of Leeds	United Kingdom	6	302	50.33	2006	2017	6
Universidad de Castilla-La Mancha	Spain	4	19	4.75	2017	2018	2
George Washington University	United States	4	100	25.00	2003	2017	3
EADA Business School	Spain	4	24	6.00	2017	2018	3
Vrije Universiteit Amsterdam	Netherlands	4	44	11.00	2010	2018	2
Julius-Maximilians-Universität Würzburg	Germany	4	505	126.25	2010	2012	4
Universität Oldenburg	Germany	4	9	2.25	2018	2018	2
University of Liverpool	United Kingdom	4	18	4.50	2018	2018	2

A: Number of total articles; C: Number of citations for all articles; C/A: Average citation per article; 1st A: Year of first published article Last A: Year of last published article.
Source: own elaboration based on Scopus 2019.

Table 6

The top 10 most productive authors on SE research from 2002 to 2018.

Author	A	C	C/A	1st A	Last A	h-Index	Country	Affiliation
Cohen, B.	7	589	84.14	2006	2018	6	Spain	EADA Business School
Muñoz, P.	6	47	7.83	2015	2018	4	Chile	Universidad del Desarrollo
Carayannis, E.G.	4	110	27.50	2003	2017	3	United States	George Washington University
Lans, T.	4	88	22.00	2014	2018	3	Netherlands	Wageningen University and Research Centre
Schaltegger, S.	4	412	103.00	2011	2018	3	Germany	Leuphana Universität Lüneburg
Blok, V.	3	88	29.33	2014	2018	3	Netherlands	Wageningen University and Research Centre
Fellnhöfer, K.	3	25	8.33	2014	2018	3	Finland	Lappeenranta Teknillinen Yliopisto
Kraus, S.	3	26	8.67	2014	2018	3	France	École Supérieure du Commerce Extérieur
Tilley, F.	3	227	75.67	2006	2006	3	United Kingdom	University of Leeds
Wagner, M.	3	497	165.67	2010	2011	3	United States	Cray Inc.

A: Number of total articles; C: Number of citations for all articles; C/A: Average citation per article; 1st A: Year of first published article; Last A: Year of last published article. Source: own elaboration based on Scopus 2019.

attracted to the SE topic.

Fig. 6 illustrates an overlay visualization map based on the citations that the authors received from 2002 to 2018. This figure allows citation changes to be shown over time; i.e. it helps to identify which authors received more citations in the past to detect the authors that were “founders” and relevant for the emergence of a topic. It also enables the authors who have been receiving more citations in recent years to be recognized. As seen, Schaltegger S. is the leader of an atomized collaboration network. Although Wagner M. and Cohen B. are a little more isolated, they are also presented as leaders in this area of study, reaffirming the results obtained in Table 6. However, it should be noted that these three authors received major citations between 2012 and 2015, i.e. they have been relevant to the progress and growth of this area of study, but in recent years there are other authors that are receiving more attention, such as Tiemann I., Fichter K. and especially Muñoz P., who is becoming a hotspot trend.

Table 7 presents the top five most cited articles from 2002 to 2018, all of which have received more than 200 citations. This analysis is relevant due to the fact that the citation number shows the popularity and influence of each paper in the scientific community. The most cited paper is from Dean and McMullen (2007) with 383 citations while other influential papers are Cohen and Winn (2007) article with 374 citations and Schaltegger and Wagner (2011) study with 335. Trying to avoid the effect of publication years, the variable C/Y is calculated. If this indicator is analyzed we see that the most influential paper is from Schaltegger and Wagner with 47.9 citations per year, a study which is published

in the *Business Strategy and the Environment* journal. Moreover, all of these five papers postulate a definition of SE; maybe this is an important reason behind them having a high number of citations. Finally, it is important to mention that three of the five articles have been published by the same journal, *Journal of Business Venturing*.

4.2. Content analysis

4.2.1. Research trends

As stated before, for a better analysis of the strategic diagrams the research must be divided in at least two sub-periods. Moreover, following the criteria of some previous studies (Cobo et al., 2015; Murgado-Armenteros et al., 2015), the first sub-period is longer (2002–2014) than the second (2015–2018). According to previous studies (Cobo et al., 2015; Murgado-Armenteros et al., 2015), which have analyzed recent and emerging fields, this is necessary to obtain a first sub-period of a reasonable size due to the low productivity during the initial years. The first sub-period includes 72 papers, while the second sub-period 144.

The strategic diagram shown in Fig. 7 represents the first sub-period (2002–2014). It presents three motor themes, three basic themes, three emergent or decadent themes and three peripheral themes. The size of the spheres represents the number of documents and the labels represent the h-Index of each topic. Table 8 complements Fig. 7 by evidencing some qualitative indicators of the bibliometric impact of each theme, e.g. citations count and h-index, as well as showing the centrality and density. As stated before, the motor themes are those that are well developed and relevant in the structure

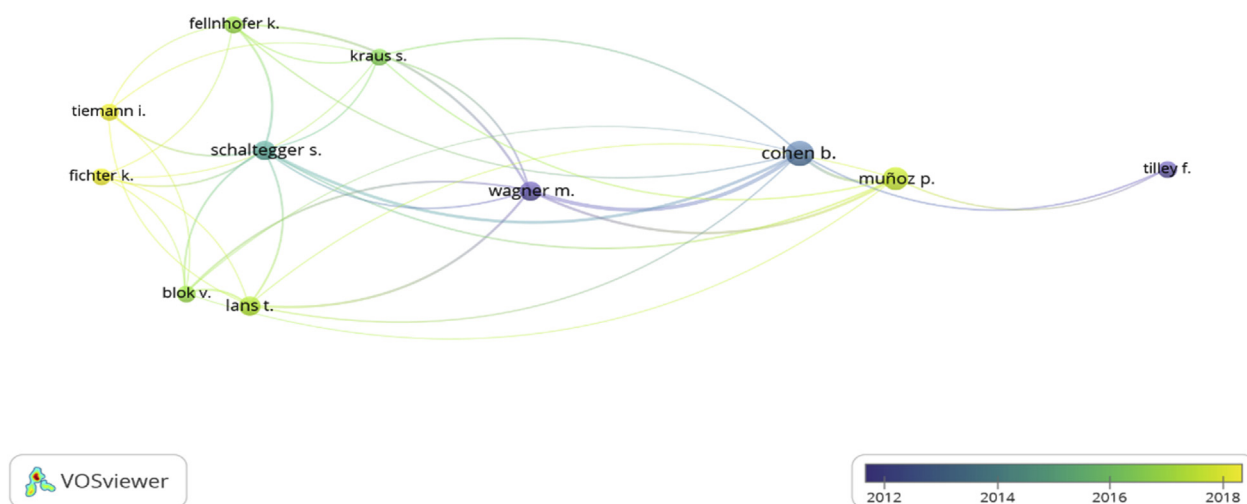


Fig. 6. Overlay visualization based on citations from 2002 to 2018. Source: data from Scopus (2019) generated using VOSviewer.

Table 7

The top 5 most cited articles from 2002 to 2018.

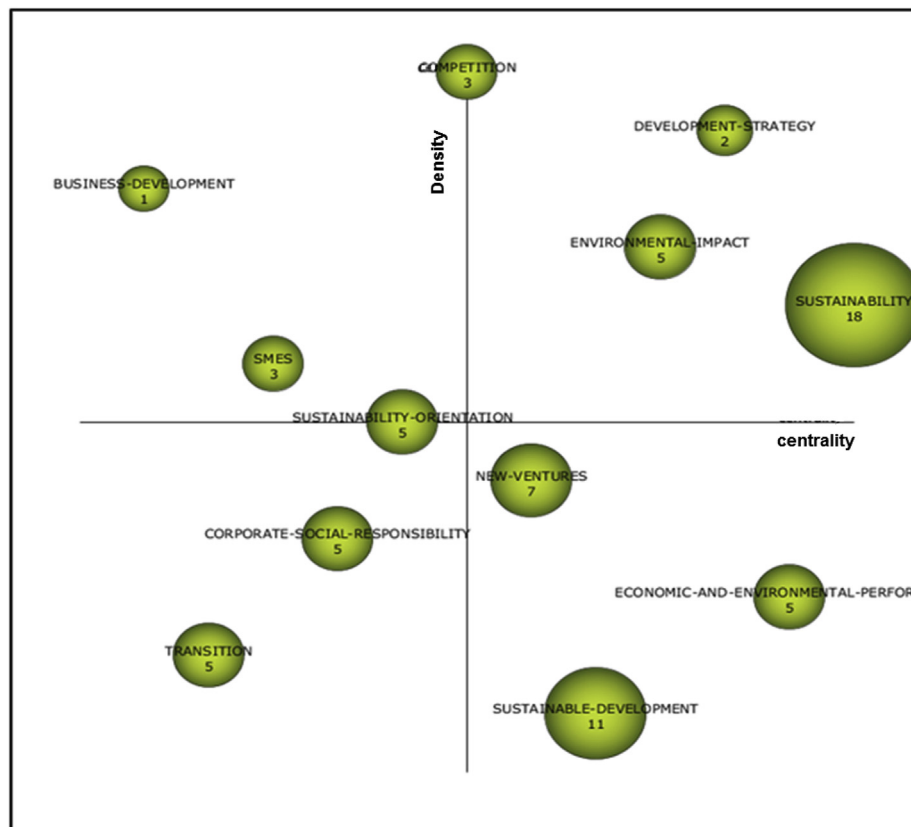
Title	Author/s	Journal	C	Year	C/Y
Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action	Dean, T.J., McMullen, J.S.	Journal of Business Venturing	383	2007	34.8
Market imperfections, opportunity and sustainable entrepreneurship	Cohen, B., Winn, M.I.	Journal of Business Venturing	374	2007	34.0
Sustainable entrepreneurship and sustainability innovation: Categories and interactions	Schaltegger, S., Wagner, M.	Business Strategy and the Environment	335	2011	47.9
Greening Goliaths versus emerging Davids - Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship	Hockerts, K., Wüstenhagen, R.	Journal of Business Venturing	257	2010	32.1
The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking "What Is to Be Sustained" With "What Is to Be Developed"	Shepherd, D.A., Patzelt, H.	Entrepreneurship: Theory and Practice	203	2011	29.0

C: Total number of citations; C/Y: Average number of citations per year. Source: own elaboration based on Scopus 2019.

of SE field (Cobo et al., 2011). In this first sub-period it can be seen that *Sustainability*, *Environmental impact* and *Development strategy* were the topics that presented a high density and a strong centrality. The position of *Sustainability* is not surprising because in the first years of research this field was a pure mix between sustainability theory and entrepreneurship theory (Urbaniec, 2018).

Environmental impact was also an important driver for SE between 2002 and 2014 because research on this topic was mainly focused on public policies. Expanding economic international relations and increasing firm activities have also brought about an increase in the environmental impact, thus SE was born, in part to reduce

environmental impact (Keijzers, 2002). In this context, Balkienė (2013) argued that the public policies of several countries reflected an increase in their efforts to mitigate the environmental impact of firms. Furthermore, *Development strategy* is a motor theme in which research was concentrated in local development and the agricultural sector. This is a concept closely related to the first researchers influenced by a sustainable management perspective, because these academics highlighted the importance of economic development (Urbaniec, 2018). In this regard, Rodríguez-Pose and Palavicini-Corona (2013, p. 303) stated that "*local economic development (LED) strategies are increasingly being recommended as an alternative or a*

**Fig. 7.** Strategic diagram from 2002 to 2014.

Source: data from Scopus (2019) generated using SciMAT.

Table 8

The characteristics of the strategic diagram topics from 2002 to 2014.

Topics	Documents	h-Index	Citations	Centrality	Density
Sustainability	33	18	2444	1.00	0.67
Sustainable-development	13	11	650	0.67	0.08
Economic-and-environmental-performance	8	5	204	0.92	0.25
New-ventures	7	7	318	0.58	0.42
Transition	7	5	546	0.17	0.17
Sustainability-orientation	6	5	389	0.42	0.50
Corporate-social-responsibility	6	5	384	0.33	0.33
Environmental-impact	5	5	282	0.75	0.75
SMEs	5	3	156	0.25	0.58
Competition	3	3	50	0.50	1.00
Development-strategy	2	2	102	0.83	0.92
Business-development	2	1	151	0.08	0.83

Source: own elaboration based on data from Scopus (2019), generated using SciMAT.

complement to traditional development strategies” and that LED strategies can help to reach the socioeconomic goal of sustainable development. Thus, development strategies are relevant for SE research.

Regarding the basic themes, it can be argued that *Economic and environmental performance* was an important topic of research mainly focused on economic and environmental effects and their relation with stakeholders. This theme is also closely related with the researchers influenced by the perspective of sustainable management, because it highlights the importance of two results of the TBL (Crals and Vereeck, 2005; Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011). In this vein, it analyzes the impact on the economic and environmental spheres (Sarango-Lalangui et al., 2018; Urbaniec, 2018) and highlights the relevance of improving the quality of life of stakeholders (Crals and Vereeck, 2005). Another basic topic is *Sustainable development*, which is logical due to the increased attention given by several researchers (Cohen and Winn, 2007; Gibbs, 2006; O'Neill et al., 2006) to the connection between this and entrepreneurship that has led to the concept of SE (Aghelie et al., 2016). Also, it is important to see the *New Ventures* topic, in which research was focused on social and environmental entrepreneurship. According to Schaltegger and Wagner (2011) new ventures are key transformers of a sustainable economy, because of their capacity to innovate that can engender new social and environmental solutions. Moreover, Hockerts and Wüstenhagen (2010) highlight the importance of new ventures in SE arguing that in some circumstances new sustainable firms are the only accessible method with which to bring sustainable innovations to market even if these were developed in incumbent companies.

We also found some emergent or decadent themes such as *Transition*, *Corporate Social Responsibility (CSR)* and *Sustainability Orientation*. These themes have low density and low centrality. So it is important to see if these themes evolve to a better position or if they disappear in the second sub-period. *Transition* topic was mainly focused on the analysis of the transformation of some industries towards sustainability, e.g. the Dutch construction sector (Woolthuis, 2010). Six different studies address the *Corporate Social Responsibility (CSR)* theme, mainly arguing that CSR is a term related to SE, but not synonymous (Choi and Gray, 2008; Hansen and Schaltegger, 2013), and therefore they try to differentiate these concepts. On the other hand, the *Sustainability Orientation* theme was mainly addressed through the study of heterogeneities in sectors transformation that adopt a sustainability orientation. Scholars claim that the degree of sustainable-orientation towards industry transformation varies in each country due to government policies, but that this orientation is always triggered by changes introduced by business leaders and entrepreneurs within businesses (Hansen and Schaltegger, 2013). Finally, the three peripheral themes are *Competition*, *SMEs* and *Business development*. They are marginal for SE because

they have well-developed but isolated themes.

The second sub-period (Fig. 8 and Table 9) shows four motor themes, three basic themes, four nascent or decadent themes and three peripheral themes. Regarding the motor themes and in concordance with previous studies (Belz and Binder, 2017; Muñoz and Cohen, 2018; Muñoz and Dimov, 2015) it is important to note that the *Entrepreneur* is highlighted as the most important “actor” for achieving SE. As stated by previous studies (Belz and Binder, 2017; Muñoz and Dimov, 2015) sustainable entrepreneurs are seen as the most relevant change agents because of their ability to manage the environmental, social and economic aspects of a business. However, this is a research gap which opens the possibility for new research (Hall et al., 2010; Muñoz and Cohen, 2018; Sarango-Lalangui et al., 2018); it is relevant to comprehend how sustainability entrepreneurs can achieve and maintain a dynamic balance of the TBL goals within their businesses. *Economic and social effects* is another motor theme; within this topic, research is focused on investments and CSR. As stated above, SE is related to CSR (Sarango-Lalangui et al., 2018), because CSR promote actions to achieve social and environmental goods beyond the core interest of the firm (McWilliams and Siegel, 2001). It is important to understand how these economic and social effects caused by the CSR policy, despite not being part of the core business, help firms to achieve sustainability.

Regarding the motor topic *Environmental Entrepreneurship (EE)*, as mentioned above, this has many common aspects with SE, however it can be said that the coherent search of environmental stability, social equity and economic viability of SE causes EE to be encompassed by SE (Thompson et al., 2011; Urbaniec, 2018). Finally, regarding the theme *Developing-countries*, the research was mainly focused on the economic, social and environmental performance of SMEs in diverse developing economies, such as Zambia (Choongo et al., 2016), Bangladesh (Maas et al., 2015), Iran (Hosseini, and Ramezani, 2016) and South Africa (Ras and Vermeulen, 2009). This provides evidence for the growing interest in SE research in some developing countries. In that sense, it is necessary to increase research on this topic to a wide number of developing countries which would help to compare how diverse countries are implementing sustainable business policies and the impact of said policies.

The three basic themes represent topics that are important however they must continue to be developed. Along these lines, it can be seen that *Opportunity recognition* is a topic that is just evolving from basic to motor theme. This topic is important for researchers (Belz and Binder, 2017; Cohen and Winn, 2007; Dean and McMullen, 2007; Hockerts and Wüstenhagen, 2010; Pacheco et al., 2010; Patzelt and Shepherd, 2011) that are influenced by the entrepreneurship process perspective. To them, the basis for SE is the relationship between entrepreneurs and opportunities (Belz and Binder, 2017; Dean and McMullen, 2007) and the SE process begins with the recognition of opportunity (Hockerts and Wüstenhagen, 2010; Pacheco et al., 2010).

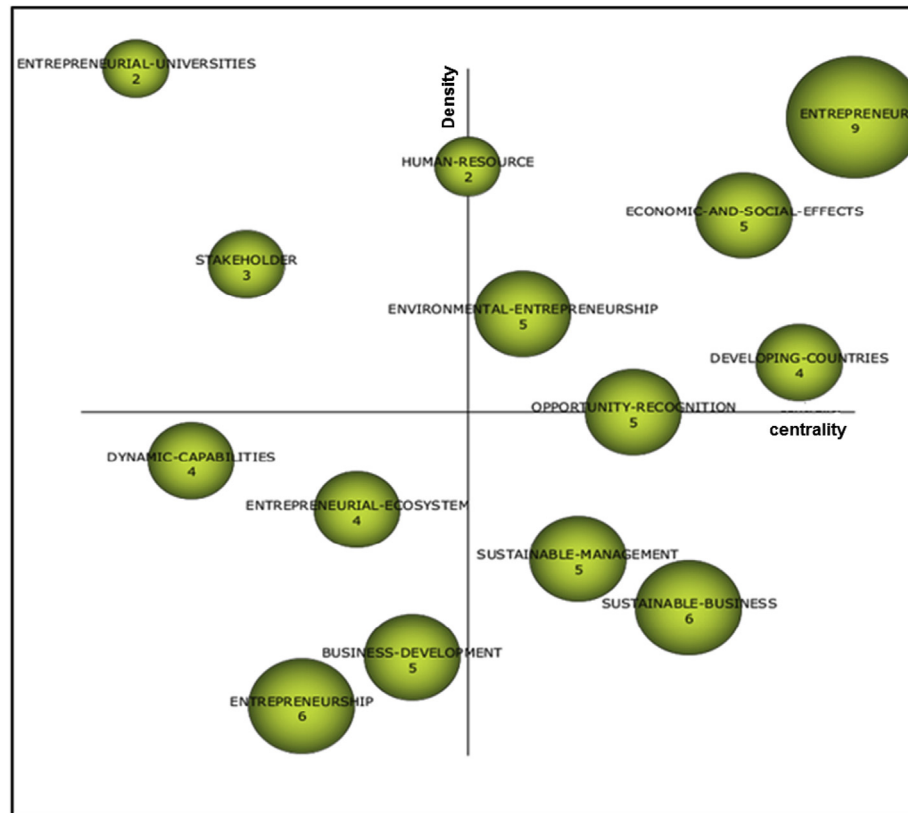


Fig. 8. Strategic diagram from 2015 to 2018.
Source: data from Scopus (2019) generated using SciMAT.

Table 9
The characteristics of the strategic diagram topics from 2015 to 2018.

Topics	Documents	h-Index	Citations	Centrality	Density
Entrepreneur	75	9	451	1.00	0.93
Entrepreneurship	32	6	153	0.29	0.07
Sustainable-business	24	6	184	0.79	0.21
Sustainable-management	23	5	112	0.64	0.29
Environmental-entrepreneurship	16	5	86	0.57	0.64
Business-development	14	5	160	0.43	0.14
Entrepreneurial-ecosystem	13	4	40	0.36	0.36
Opportunity-recognition	13	5	58	0.71	0.50
Economic-and-social-effects	12	5	166	0.86	0.79
Developing-countries	10	4	97	0.93	0.57
Stakeholder	8	3	15	0.21	0.71
Dynamic-capabilities	7	4	44	0.14	0.43
Human-resource	6	2	20	0.50	0.86
Entrepreneurial-universities	5	2	12	0.07	1.00

Source: own elaboration based on data from Scopus (2019) generated using SciMAT.

Research on this topic is focused on the sustainable entrepreneurial orientation and sustainable business opportunities. In this vein, some researchers (Patzelt and Shepherd, 2011; Sarango-Lalangui et al., 2018) argued that the basis for creating sustainable business is to have sustainable development thinking since entrepreneurs can recognize long-term entrepreneurial opportunities. This theme has to be further developed, for example, seeking to understand how an entrepreneur can identify and develop sustainable business opportunities (Muñoz and Cohen, 2018).

In a methodological approach, these topics have emerged as motor themes because they achieved strong centrality and high density. In a theoretical-practical approach, building on Sahlman (1996) framework and Muñoz and Cohen (2018) study, it can be argued that these

themes appear under the need to analyze a phenomenon through four interrelated factors; people, context, deal and opportunity. This means, for example, that the appearance of *Entrepreneur* as a motor theme could be understood since entrepreneurs are the most important individuals in the development of sustainable firms, so they have a central relevance in the development of the topic. In the same view, the emergence of *Developing-countries* as a motor theme could be understood at a contextual factor (defined as those aspects that an entrepreneur or entrepreneurial firm cannot control) of this phenomenon, where scholars try to clarify which factors influence the recognition of sustainable opportunities (Choongo et al., 2016) or network trust building (Maas et al., 2015) in some developing countries. Topics such as *Economic and social effects* and *Environmental*

Entrepreneurship for their part can be seen as deal factors or also named as outcomes by Muñoz and Cohen (2017). Outcomes need to deliver a set of values and in the case of SE environmental, social and economic benefits to the firm and to the stakeholders. Finally, *Opportunity recognition*, which is at the heart of SE represents the opportunity factor of Sahlman (1996) framework because, without the identification of a sustainable opportunity, there will not be any opportunities to exploit. As seen, the emergence of these topics could be argued based on the circumstance that they are the most important aspects in the study of each interrelated factor when studying the SE phenomenon.

Another ever-growing theme is *Sustainable management*, where researchers are mainly studying the importance of innovation, which is seen as a relevant element in the discovery of new solutions for environmental sustainability (Aghelie et al., 2016). According to the previous literature (Kraus et al., 2018) there exist three important levels to accomplish the successful implementation of sustainable management practices: individual, organizational and contextual. On the individual level, entrepreneurs base their intention to act in a more sustainable way on their personal traits and values, while on the organizational level, it is necessary to adopt a sustainable orientation based on the reconfiguration of resources and on the corporate culture of each organization. Finally, with regard to the contextual level, academics focus their attention on understanding how entrepreneurs can help the environment and society through sustainable entrepreneurship (Kraus et al.,

2018; Sarango-Lalangui et al., 2018). However, this is a topic that presents a research gap. At the individual level for example, more research is needed in order to comprehend the practice backgrounds and also the practices adopted by the sustainable firm's founders and how these guarantee a sustainable entrepreneurial orientation in their companies. On the other hand, at the organizational level, more studies are needed to understand the relation between corporate financial performance and corporate ethical practices or even to further the understanding of the ethical dimensions when developing close relationships with outside associates (Kraus et al., 2018).

We can also observe that another basic topic is *Sustainable business*, which is logical, inasmuch as it is a central research issue for this field (Shepherd and Patzelt, 2011). *Sustainable business* research is focused on sustainable business models. Recently, some researchers (Nosratabadi et al., 2019; Schaltegger et al., 2016) have emphasized the importance of this topic postulating that diverse industries and businesses have used sustainable business models to satisfy their social, environmental and economic goals sequentially. Moreover, literature (Nosratabadi et al., 2019) states that the process of creating a sustainable business model is part of an innovative business strategy. However, according to recent studies (Nosratabadi et al., 2019; Schaltegger et al., 2016) this topic is also presented as a research gap. Consequently, more research may be carried out to understand how the transition process from a traditional to a sustainable business model is implemented in different economic sectors (Nosratabadi

Table 10
An overview of current focus and for looking ahead in SE.

Theme	Current focus	Looking ahead
Sustainable entrepreneurs	Overemphasis on highlighting sustainable entrepreneurs as the most important "actors" to achieve SE.	Turn attention to how sustainable entrepreneurs can achieve and maintain a dynamic balance of the TBL goals within their businesses.
Economic and social effects	Focused on the different levels of importance that investors give to economic performance in comparison with social performance.	Try to understand how governmental policies could spur investors to invest in firms with social viewpoints.
Developing-countries	Overemphasis on the economic, social and environmental performance of SMEs in some specific developing economies.	Broaden research on this topic to a wide number of developing countries which would help to compare how diverse countries are implementing sustainable business and the impact of this.
Opportunity recognition	Focused on the sustainable entrepreneurial orientation and sustainable business opportunities.	More emphasis on how an entrepreneur can recognize and develop sustainable business opportunities.
Sustainable management	At individual level, focused on why entrepreneurs act in a more sustainable way based on their personal traits and values. At organizational level, overemphasis on sustainable orientation based on the reconfiguration of resources and on the corporate culture of each organization.	At individual level, broaden research to comprehend the practices adopted by the founders of sustainable firms and how these guarantee a sustainable entrepreneurial orientation in their companies. At organizational level, turn attention to the relation between corporate financial performance and corporate ethical practices.
Sustainable business	Focused on how diverse industries have used sustainable business models to satisfy their social, environmental and economic goals sequentially.	A better explanation is needed to understand how the transition process from a traditional to a sustainable business model is implemented in different economic sectors.
Dynamic capabilities	Dedicated to the analysis of sustainable entrepreneurial orientation as a dynamic capability that can result in a better sustainability performance.	Turn attention to the detection of which dynamic capabilities can help to meet the emerging sustainability challenges in a more effective way.
Entrepreneurial ecosystem	Focused on organizational and individual factors of sustainable entrepreneurs that influence in entrepreneurial ecosystem configuration. Importance of stakeholder participation and support as key success factors for sustainable entrepreneurial ecosystems. Consideration of social capital to foster effective management of the entrepreneurship ecosystem.	Integrate different approaches or theoretical frameworks, such as the dynamic network approach, stakeholder theory and capital social, to help entrepreneurs and policy makers to incorporate business ecosystems within their communities.
Business development	Emphasis on the transition or development of traditional businesses towards sustainability based on the implementation of sustainable practices.	Study how the life cycle stage of the company and its industry affects its transition to sustainability.
Human Resources	Focused on how workers with sustainability orientation could become a competitive advantage in businesses.	Turn attention to understand how cognitive legitimacy of workers affects the power of attraction of sustainable businesses. How sustainable ventures can attract management talent.

et al., 2019).

Emergent or decadent themes can also be observed, such as *Dynamic-capabilities* based on firm performance and sustainable entrepreneurial orientation research and *Entrepreneurial ecosystems*, where studies are focused on life-cycle and sustainable entrepreneurs. Also, *Business development* with a huge link with family firms and the TBL and *Entrepreneurship* mainly focused on its relation with public policy and start-ups. No studies about *Dynamic-capabilities* where found in the first period, so it can be stated that this theme is emergent not decadent. The emergence of this topic is mainly due to the suggestion of some scholars (Criado-Gomis et al., 2017; Criado-Gomis et al., 2018) that sustainable entrepreneurial orientation should be viewed as a dynamic capability that enables firms to conduct a multiple strategic orientation, both to obtain an entrepreneurial mindset and to integrate sustainable practices into the company strategy. The *Entrepreneurial ecosystems* concept has received increasing attention in recent years (Simatupang et al., 2015). such This topic is a nascent stage and “requires a stronger theory orientation and the consideration of some emergent methodological opportunities” (Simatupang et al., 2015, p.396). On the other hand, in the first period, only two articles referring to *Business development* were found, while in the second period fourteen studies were identified, demonstrating that this is also an emergent topic. Research on this theme is mainly focused on the transition or development of traditional businesses towards sustainability, e.g. the implementation of sustainable practices in SMEs (Soto-Acosta et al., 2016; Steinz et al., 2016) or in family firms (Hernández-Perlines and Rung-Hoch, 2017) or case studies on the transition of agricultural business in Burundi (Mupfasoni et al., 2018).

Finally, it is worth mentioning that *Human-resource* is a theme right in the middle between being a motor theme or a peripheral theme. This can be explained by understanding that, until recently, there was very little talk about the importance of human capital within sustainable business strategy. However a recent study (Kucharčíková et al., 2018) stated human resources as being the

bearers of the available human capital on SE to the company, so the employees are being recognized as a competitive advantage for the achievement of SE. Keizer et al. (2016) argued that one of the main differences between sustainable businesses and commercial businesses and is the complication of attracting management talent. Moreover, Thompson and Eijkemans (2018) analyzed why some sustainable ventures fail to attract management professionals, stating that one relevant reason in that as sustainable businesses are relatively new, they possess lower levels of cognitive legitimacy. In this regard, the lack of structure or a non-human capital prioritization overrides other aspects related to the development of the company and affects the attraction of management professionals to be part of a sustainable venture (Thompson and Eijkemans, 2018). This topic is a very interesting research gap which may attract the attention of researchers from various fields of study. For example, in the psychology field, it is relevant to understand how cognitive legitimacy, defined as how well organizations execute their activities from their stakeholder's point of view (Suchman, 1995) affects management professionals' decisions to work in a sustainable venture or not. Furthermore, human resources researchers may be interested in establishing how sustainability ventures can attract management talent that are committed to accomplishing the missions of reducing environmental degradation and social ills without ignoring the economic growth of the company.

In order to facilitate a more intuitive snapshot of the current focus as well as the opportunities for future research directions, we provide Table 10 with a synthesis of our main content findings and suggestions for looking ahead.

4.2.2. Keywords

This sub-section complements the analysis of research trends by analyzing the twenty most used keywords through a density visualization map based on the co-occurrence of keywords (see Fig. 9). As seen, sustainable entrepreneurship has a strong link with sustainable development as stated in previous literature (Cohen and Winn, 2007;

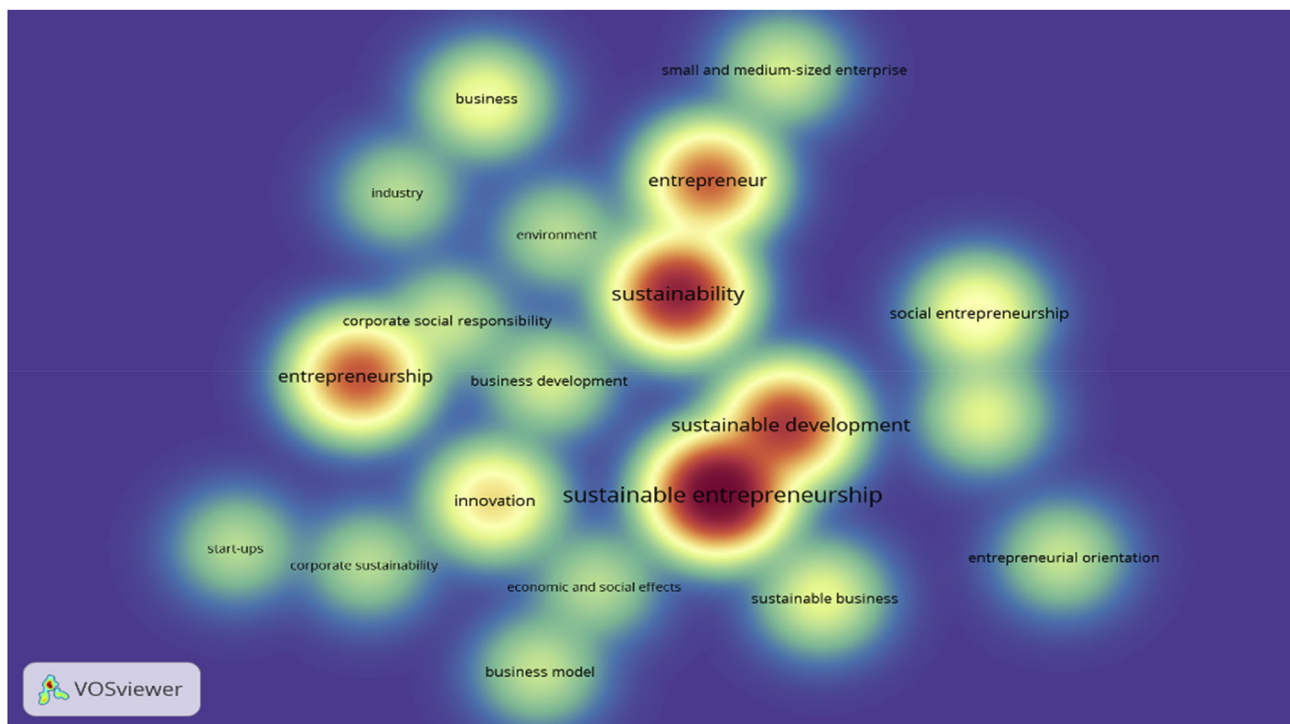


Fig. 9. The 20 most used keywords on SE research from 2002 to 2018. Source: data from Scopus (2019) generated using VOSviewer.

Gibbs, 2006; O'Neill et al., 2006). Sustainable entrepreneurship is also leading a cluster that is formed by other keywords such as: social entrepreneurship, environmental entrepreneurship, sustainable business and entrepreneurial orientation. It can be stated that this cluster is formed by the principal theories related to SE. Other relevant topics within SE research are entrepreneur (as an individual) and sustainability, which also possess a strong connection between them. These two keywords are part of a cluster that also encompasses SMEs and business development. It can also be observed that entrepreneurship is another widely used keyword within SE articles. It has a strong link with other keywords such as business, industry, environment, economic and social effects and CSR.

Finally, it is important to mention that innovation appears as another very common keyword with a strong link with business model, start-ups and corporate sustainability. As stated before, innovation is a relevant topic within SE research because it is seen as a relevant element to find new answers for sustainability entrepreneurship (Aghelie et al., 2016) and also because it can help to increase firms productivity and consequently to promote the creation of new workplaces (Foster et al., 2013). What is more, innovation is thought to lead to the emergence of new sustainable ventures, thereby introducing new environmental and social solutions (Schaltegger and Wagner, 2011). In this way, innovation may be a driver for the adoption of sustainable behavior in an industry or sector (York and Venkataraman, 2010). Thus, innovation appears closely linked to SE and emerges as a driving force behind it.

5. Conclusions

The purpose of the study is, through a bibliometric analysis, to reflect the status of the SE field, identify key topics and establish future challenges for research. By doing so, this study has made a number of contributions to the SE literature as well as complementing previous literature analyses.

This review encompasses a great number of peer-reviewed articles (216 in total, between 2002 and 2018). Literature specific to SE is well distributed among various subject areas. Accordingly, SE research is published in more than 100 journals on diverse research issues such as: entrepreneurship, environment, international business and international management. This shows that, despite the fact that this field began on the basis of the attention paid by researchers of sustainable management and entrepreneurial activity, nowadays SE is a mainstream study area that receives the attention of academics from many different disciplines. This interest in SE is also evident in the geographic and academic variety, in terms of contributions made by countries and institutions of origin. The three main contributor countries (the UK, Germany and the USA) are also the leaders of different clusters of an increasing international collaboration network which is developing investigation on SE. Furthermore, it can be argued that although SE research began in the late 90s it has been an emergent topic since 2009 due to the first definitions of the field dating back to 2005 and 2007. Moreover, in the last seven years (2012–2018) the number of publications has undergone an exponential increase along with the number of citations, which leads us to conclude that SE research is a developing trend. The increased interest in the SE field is due, among other issues, to the emergence of specialized journals, the publication of special issues in well-known journals, the current demand for more research and the growing importance given by different actors, such as companies, international institutions and higher education institutions. The most productive authors are Cohen, Muñoz, Parayannis, Lans, and Schaltegger. Regarding the most cited authors and papers, it can be stated that the most representative authors for the development of SE research are Cohen, Schaltegger and Wagner.

Taking advantage of the keywords that authors use to characterize

their works and based on co-occurrence analysis we illustrate two strategic diagrams, which allows previously researched themes and emerging research trends to be detected. The analysis shows that the five most relevant themes under study in current literature are: (1) sustainable entrepreneurs, (2) economic and social effects, (3) environmental entrepreneurship, (4) developing countries and (5) opportunity recognition. These five topics form a coherent body of knowledge based on Sahlman (1996) framework of the four interrelated factors for the study of any phenomenon. However this does not mean that these topics do not need further research. The strategic diagrams also let us establish that another six themes are basic or emergent in SE research, thus requiring more attention from academics. Those are (1) sustainable management, (2) sustainable-business, (3) human resources, (4) entrepreneurial ecosystems, (5) dynamic capabilities and (6) business development. From these eleven themes, several future research suggestions are discussed within sub-section 3.2.1. (Research trends) and summarized in Table 10. To a large extent the analysis of the most used keywords agrees with the research trends analysis but it also highlights the importance of innovation as being a key element within SE.

The value of this research can be appreciated by its implications. Recent calls for further research (Fellnhöfer et al., 2014; Gast et al., 2017; Kraus et al., 2018; Muñoz and Cohen, 2018) seek analyses that help to bring clarity to the SE phenomenon, arguing that this topic, as one of increasing interest, requires to be analyzed, organized and synthesized due to the fact that it lacks a clear understanding. By presenting a well-established and comprehensive bibliometric analysis that will help novel and senior researchers to broaden their knowledge about SE research this study fills this literature gap. Novel researchers or academics who are interested in entering in this field can obtain a complete overview about the origin, evolution and current status of SE research. They can also find a synthesized summary of the diverse definitions, perspectives and research trends within this field. Moreover, novel and senior researchers can see a complete picture of the global research on SE and how it is distributed between subject areas, journals, countries, institutions and authors. This is relevant since it helps us to understand that organizations and academic agents are constantly developing this field. Finally, academics who are already researching on this topic may find this study significant as it presents several proposals for future research opportunities.

With regard to managerial insights derived from this study, managers and entrepreneurs could benefit from a complete analysis of the academic actors (authors, institutions and countries) who are constantly developing this field. This allows them to easily identify references with which to further their comprehension of SE. They may also benefit from an approximation to various current research trends that are of managerial interest, i.e. managers may find out how academic agents are trying to help companies through the understanding of various phenomena associated with SE. For example, managers could notice that research is underway on why the cognitive legitimacy of workers affects the power of attraction of sustainable businesses and how sustainable ventures can attract management talent. Furthermore, they can observe that research is being carried out both to understand how the transition process from a traditional to a sustainable business model is implemented in different economic sectors and to comprehend the practices adopted by the sustainable firm's founders and how these guarantee a sustainable entrepreneurial orientation in their companies.

However, an emerging field of research, as is the case of SE, cannot move forward based solely on capitalizing the existing body of knowledge, but rather it is necessary to find opportunities to broaden and enrich its knowledge base. SE is a unique opportunity to interconnect entrepreneurship and sustainability theory, which are two disciplines that are nurtured by a diversity of concepts and

perspectives of other research fields. Thus, scholars of diverse disciplines should continue to develop SE research by increasing their efforts to introduce new ideas from their original disciplines. Moreover, an emerging field needs to develop not only knowledge construction but also social construction, i.e. it is important that it is not only ideas that meet, but also that people meet. With this objective in mind, certain actions could be taken, such as (1) increasing the number of social events (conferences, special tracks, workshops) with SE as a core topic; (2) encouraging the creation of more multidisciplinary groups of researchers when addressing the topic of SE; (3) importing ideas from other disciplines to export existing knowledge of SE to communities and journals of other fields; and (4) continuing to debate on SE.

The limitations of this study, as with other bibliometric analyses, lie with the selection of keywords that can directly condition the results of this research. As stated above, this happens because the SE concept has evolved in recent years to the extent that different terms are associated with the same concept, however, as we have argued, SE is seen as a unique concept that differs from other related terms. The selection of one database instead of another can also result in a limitation since the sample may differ, however Scopus was selected over the other major database (Web of Science), because almost 84% of the articles of WoS can be found in Scopus and the WoS database includes fewer indexed journals than Scopus, so by selecting Scopus the risk of overlooking documents during the search is reduced. Finally, the study periods employed in the strategic diagrams could also condition the results, since the selection of periods is based on the

investigators' decision. Nevertheless, it can be argued that the selection made in this study is reinforced as the authors based it on previous studies that used SciMAT for the analysis of emerging fields as is the case of SE.

Author contributions section

Eduardo Terán-Yépez: Conceptualization, Methodology, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Project administration. **Gema María Marín-Carrillo:** Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Visualization. **María del Pilar Casado-Belmonte:** Conceptualization, Investigation, Data Curation, Writing - Review & Editing, Visualization. **María de las Mercedes Capobianco-Uriarte:** Validation, Investigation, Data Curation, Writing - Review & Editing, Visualization.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Evolution of Sustainable Entrepreneurship definitions

Author/s (Year)	Definitions	Approach
Crals and Vereeck (2005)	"The continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce, their families, the local and global community as well as future generations"	Sustainable management perspective
Dean and McMullen (2007)	"The process of discovering, evaluating, and exploiting economic opportunities that are present in market failures which detract from sustainability, including those that are environmentally relevant"	Entrepreneurship process perspective
Cohen and Winn (2007)	"The examination of how opportunities to bring into existence 'future' goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences"	Entrepreneurship process perspective
Katsikis and Kyrgidou (2007)	"The teleological process aiming at the achievement of sustainable development, by discovering, evaluating and exploiting opportunities and creating value that produces economic prosperity, social cohesion and environmental protection"	Entrepreneurship process perspective
Hockerts and Wüstenhagen (2010)	"The discovery and exploitation of economic opportunities through the generation of market disequilibria that initiate the transformation of a sector towards an environmentally and socially more sustainable state"	Entrepreneurship process perspective
Pacheco et al. (2010)	"The discovery, creation, evaluation, and exploitation of opportunities to create future goods and services that is consistent with sustainable development goals"	Entrepreneurship process perspective
Schaltegger and Wagner (2011)	"An innovative, market-oriented and personality driven form of creating economic and societal value by means of break-through environmentally or socially beneficial market or institutional innovations"	Sustainable management perspective
Shepherd and Patzelt (2011)	"Is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society"	Sustainable management perspective
Patzelt and Shepherd (2011)	"The discovery, creation, and exploitation of opportunities to create future goods and services that sustain the natural and/or communal environment and provide development gain for others"	Entrepreneurship process perspective
Lans et al. (2014)	"A way of generating competitive advantage by identifying sustainability as new business opportunities, resulting in new and sustainable products, methods of production or ways of organizing business processes in a sustainable way"	Sustainable management perspective
Belz and Binder (2017)	"The recognition, development and exploitation of opportunities by individuals to bring into existence future goods and services with economic, social and ecological gains"	Entrepreneurship process perspective
Urbaniec (2018)	"The types of business development practices that provide new opportunities for innovative corporate activities at the nexus of ecological and social issues"	Sustainable management perspective

Source: Adapted and updated from Urbaniec (2018), Sarango-Lalangui et al. (2018) and Muñoz and Cohen (2018).

Appendix B. List of all the papers included in the study

Authors	Year	Journal
Keijzers	2002	<i>Journal of Cleaner Production</i>
Carayannis, Evans, Hanson	2003	<i>Technovation</i>
Knight	2003	<i>Australasian Journal of Environmental Management</i>
Bass, Hatcher	2005	<i>Community College Journal of Research and Practice</i>
Crals, Vereeck	2005	<i>International Journal of Sustainable Development and World Ecology</i>
Lordkipanidze, Brezet, Backman	2005	<i>Journal of Cleaner Production</i>
Cohen	2006	<i>Business Strategy and the Environment</i>
Gibbs	2006	<i>Greener Management International</i>
Gillebo, Hugo	2006	<i>International Journal of Agricultural Sustainability</i>
Jens, Nirja, Wee Liang, Hanjun, John	2006	<i>Journal of Advances in Management Research</i>
O'Neill	2006	<i>Greener Management International</i>
Parrish, Foxon	2006	<i>Greener Management International</i>
Schlange	2006	<i>Greener Management International</i>
Tilley, Parrish	2006	<i>World Review of Entrepreneurship, Management and Sustainable Development</i>
Tilley, Young	2006	<i>Greener Management International</i>
Young, Tilley	2006	<i>Business Strategy and the Environment</i>
Cohen, Winn	2007	<i>Journal of Business Venturing</i>
Dean, McMullen	2007	<i>Journal of Business Venturing</i>
Hofstra	2007	<i>Progress in Industrial Ecology</i>
Achtenhagen	2008	<i>Journal of Media Business Studies</i>
Choi, Gray	2008	<i>Management Research News</i>
Cohen, Smith, Mitchell	2008	<i>Business Strategy and the Environment</i>
Tepstra	2008	<i>European Coatings Journal</i>
Ashby, Heinrich, Burpee, Remington, Wilson, Quiros, Aldana, Ferris	2009	<i>International Journal of Agricultural Sustainability</i>
Griffiths, Gundry, Kickul, Muñoz Fernandez	2009	<i>Journal of Small Business and Enterprise Development</i>
Paloviita	2009	<i>World Review of Entrepreneurship, Management and Sustainable Development</i>
Ras, Vermeulen	2009	<i>Sustainable Development</i>
De Palma, Dobes	2010	<i>Journal of Cleaner Production</i>
Gallis	2010	<i>World Watch</i>
Hockerts, Wüstenhagen	2010	<i>Journal of Business Venturing</i>
Kuckertz, Wagner	2010	<i>Journal of Business Venturing</i>
Pacheco	2010	<i>Journal of Business Venturing</i>
Rodgers	2010	<i>Corporate Social Responsibility and Environmental Management</i>
Woolthuis	2010	<i>Sustainability (Switzerland)</i>
York, Venkataraman	2010	<i>Journal of Business Venturing</i>
Balmer, Powell, Greyser	2011	<i>Journal of Business Ethics</i>
Carayannis, Papadopoulos	2011	<i>Journal of the Knowledge Economy</i>
Carayannis, Provance, Givens	2011	<i>IEEE Transactions on Engineering Management</i>
Kelley	2011	<i>Business Horizons</i>
Muda, Halim, Amin	2011	<i>Journal of Sustainability Science and Management</i>
Obrecht	2011	<i>International Journal of Entrepreneurship and Small Business</i>
Schaltegger, Wagner	2011	<i>Business Strategy and the Environment</i>
Shepherd, Patzelt	2011	<i>Entrepreneurship: Theory and Practice</i>
Spence, Ben-Boubaker-Gherib, Biwolé	2011	<i>Journal of Business Ethics</i>
Wagner	2011	<i>International Journal of Entrepreneurship and Small Business</i>
Fallah, Mojtahedzadeh, Mehrizi	2012	<i>Journal of Applied Sciences Research</i>
Fallah, Sadeghi, Saeedi	2012	<i>Advances in Environmental Biology</i>
Meis-Mason, Dana, Anderson	2012	<i>International Journal of Entrepreneurship and Small Business</i>
Swanson, DeVereaux	2012	<i>Advances in Culture, Tourism and Hospitality Research</i>
Wagner	2012	<i>Journal of Small Business and Entrepreneurship</i>
Atiq, Karatas-Ozkan	2013	<i>International Journal of Entrepreneurship and Innovation</i>
Balkiene	2013	<i>Journal of Security and Sustainability Issues</i>
da Silva, Borges, Feitosa, Guimarães, Lamartine	2013	<i>Espacios</i>
Hallak, Assaker	2013	<i>Asia Pacific Journal of Tourism Research</i>
Hansen, Schaltegger	2013	<i>Corporate Governance (Bingley)</i>
Parra	2013	<i>Journal of Technology Management and Innovation</i>
Rodríguez-Pose, Palavicini-Corona	2013	<i>Geoforum</i>
Salome, van Bottenburg, van den Heuvel	2013	<i>Leisure Studies</i>
Shepherd, Patzelt, Baron	2013	<i>Academy of Management Journal</i>
Bădulescu, Bădulescu, Bac, Sipos-Gug	2014	<i>Amfiteatru Economic</i>
Crnogaj, Rebernik, Hojnik, Gomezelj	2014	<i>Kybernetes</i>
Djupdal	2014	<i>World Review of Entrepreneurship, Management and Sustainable Development</i>
Fellnhöfer	2014	<i>International Journal of Business Research</i>
Gray, Duncan, Kirkwood, Walton	2014	<i>Entrepreneurship and Regional Development</i>
Lans	2014	<i>Journal of Cleaner Production</i>
Masoodi, Ahmad, Gangoo, Sofi, Mir, Saraf, Murtaza, Bashir, Bhat, Mir, Bhat	2014	<i>Forest Products Journal</i>
Onoyere	2014	<i>Mediterranean Journal of Social Sciences</i>
Papadopoulos, Karagouni, Trigkas, Beltsiou	2014	<i>EuroMed Journal of Business</i>
Pšeničny Jakopin, Vukčević, Čorić	2014	<i>Management (Croatia)</i>

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Authors	Year	Journal
Raudeliuniene, Tvaronavičienė, Dzemyda	2014	<i>Journal of Security and Sustainability Issues</i>
Rozenes, Kukliansky	2014	<i>International Journal of Information Systems in the Service Sector</i>
Willemsen, van der Veen	2014	<i>Journal of Place Management and Development</i>
Bocken	2015	<i>Journal of Cleaner Production</i>
Djupdal, Westhead	2015	<i>International Small Business Journal: Researching Entrepreneurship</i>
Ferdousi	2015	<i>Development Studies Research</i>
Hapenciuc	2015	<i>Amfiteatru Economic</i>
Hörisch	2015	<i>Journal of Cleaner Production</i>
Jamil, Ismail, Mahmood, Khan, Siddique	2015	<i>Jurnal Teknologi</i>
Kibler, Fink, Lang, Muñoz	2015	<i>Journal of Business Venturing Insights</i>
Maas	2015	<i>International Journal of Business and Globalisation</i>
Mayangsari, Novani, Hermawan	2015	<i>International Journal of Entrepreneurship and Small Business</i>
Pinkse, Groot	2015	<i>Entrepreneurship: Theory and Practice</i>
Rosmiza, Davies, Rosniza Aznie, Jabil, Mazdi, Wan Toren, Che Rosmawati	2015	<i>Mediterranean Journal of Social Sciences</i>
Roy, Guha	2015	<i>Journal of Food Science and Technology</i>
Sáenz-Segura, Schipper, Miranda, Chaves	2015	<i>Journal on Chain and Network Science</i>
Schaefer	2015	<i>Organization and Environment</i>
Silajdić, Kurtagić, Vučijak	2015	<i>Journal of Cleaner Production</i>
Tennant	2015	<i>Local Economy</i>
Uddin, Hindu, Alsaqour, Shah, Abubakar, Saba	2015	<i>Applied Mathematics and Information Sciences</i>
Wijnker, Van Kasteren, Romijn	2015	<i>Sustainability (Switzerland)</i>
Aghelie	2016	<i>Indian Journal of Science and Technology</i>
Bank, Kanda	2016	<i>Industry and Higher Education</i>
Choongo	2016	<i>Sustainability (Switzerland)</i>
de Lange	2016	<i>Journal of Cleaner Production</i>
Grindsted.	2016	<i>Journal of Cleaner Production</i>
Hooi, Ahmad, Amran, Rahman	2016	<i>Management Research Review</i>
Hosseininia, Ramezani	2016	<i>Sustainability (Switzerland)</i>
Klapper, Farber	2016	<i>International Journal of Management Education</i>
Larsson	2016	<i>Sustainability (Switzerland)</i>
Obrecht	2016	<i>International Journal of Entrepreneurship and Small Business</i>
Orsiolli, Morais-Da-Silva, De-Carli, Virtuoso, Preto, Gimenez.	2016	<i>Espacios</i>
Ruiz-Ruano, Puga.	2016	<i>Psychology</i>
Sardianou, Kostakis, Mitoula, Gkaragkani, Lalioti, Theodoropoulou	2016	<i>Environment, Development and Sustainability</i>
Schaltegger	2016	<i>Organization and Environment</i>
Scott, Govender, van der Merwe	2016	<i>Informing Science</i>
Soto-Acosta, Cismaru, Vătmănescu, Ciochină	2016	<i>Sustainability (Switzerland)</i>
Steinz	2016	<i>Business Strategy and the Environment</i>
Vatamanescu, Pinzaru, Andrei, Zbucnea	2016	<i>Transformations in Business and Economics</i>
Anderson, Lomba, Orajaka, Numfor, Saha, Janko, Johnson, Podmore, Larsen	2017	<i>IEEE Electrification Magazine</i>
Belz, Binder.	2017	<i>Business Strategy and the Environment</i>
Carayannis, Grigoroudis, Del Giudice, Della Peruta, Sindakis	2017	<i>Journal of Knowledge Management</i>
Castellano, Khelladi, Menvielle	2017	<i>International Journal of Entrepreneurship and Small Business</i>
Ceptureanu, Ceptureanu, Orzan, Bordean, Radulescu	2017	<i>Sustainability (Switzerland)</i>
Cherchem	2017	<i>Journal of Family Business Strategy</i>
Criado-Gomis	2017	<i>Sustainability (Switzerland)</i>
de Lange	2017	<i>Journal of Cleaner Production</i>
Dickel	2017	<i>Corporate Governance (Bingley)</i>
DiVito, Bohnsack	2017	<i>Journal of Business Venturing</i>
Fernandes, Veiga, Peris-Ortiz, Rueda-Armengot	2017	<i>International Journal of Social Ecology and Sustainable Development</i>
Gasbarro, Annunziata, Rizzi, Frey	2017	<i>Organization and Environment</i>
Hernández-Perlines, Rung-Hoch	2017	<i>Sustainability (Switzerland)</i>
Jabeen, Faisal, Katsioloudes	2017	<i>Journal of Small Business and Enterprise Development</i>
Jahanshahi, Brem, Bhattacharjee	2017	<i>Sustainability (Switzerland)</i>
Jayaratne, Mort, D'Souza	2017	<i>Australasian Marketing Journal</i>
Juma, James, Kwesiga	2017	<i>Journal of Small Business and Entrepreneurship</i>
Kee	2017	<i>International Journal of Entrepreneurship and Small Business</i>
Klewitz	2017	<i>Innovation</i>
Koe, Krishnan, Alias, Othman, Ridzuan	2017	<i>Advanced Science Letters</i>
Kraus	2017	<i>Sustainability (Switzerland)</i>
Laguna, Durán-Romero	2017	<i>International Journal of Social Ecology and Sustainable Development</i>
Muñoz, Cohen	2017	<i>Journal of Business Venturing Insights</i>
Outsios, Farooqi	2017	<i>Gender in Management</i>
Pierce, Ricciardi, Zardini	2017	<i>Sustainability (Switzerland)</i>
Poldner, Dentoni, Ivanova	2017	<i>Journal of Cleaner Production</i>
Poldner, Shrivastava, Branzei	2017	<i>Business and Society</i>
Ramos-González, Rubio-Andrés, Sastre-Castillo	2017	<i>Sustainability (Switzerland)</i>
Ratten, Dana	2017	<i>International Journal of Social Ecology and Sustainable Development</i>
Ruijs, van Egmond.	2017	<i>Ecosystem Services</i>
Stubbs	2017	<i>Business Strategy and the Environment</i>
Swanson, DeVereaux	2017	<i>Annals of Tourism Research</i>
Tvaronavičienė, Gatautis.	2017	<i>Economics and Sociology</i>
Vial	2017	<i>Global Business and Organizational Excellence</i>
Zacarias, Aguinaga, Lagunas	2017	<i>International Journal of Trade and Global Markets</i>
Zamfir, Mocanu, Grigorescu	2017	<i>Sustainability (Switzerland)</i>

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Authors	Year	Journal
Zolfaghari-Ejlal-Manesh, Rialp-Criado	2017	<i>Competitiveness Review</i>
Anbarasan, Sushil	2018	<i>Business Strategy and the Environment</i>
Bergset	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Bhardwaj	2018	<i>Journal of Enterprising Communities</i>
Bischoff, Volkmann	2018	<i>International Journal of Entrepreneurial Venturing</i>
Breuer Fichter, Lüdeke Freund, Tiemann	2018	<i>International Journal of Entrepreneurial Venturing</i>
Chen, Chen, Chen, Xie	2018	<i>Journal of Cleaner Production</i>
Chirinos Araque, Meriño Cordoba, Martinez De Meriño, Perez Peralta	2018	<i>Espacios</i>
Criado-Gomis	2018	<i>International Entrepreneurship and Management Journal</i>
Dai, Xue, Jiang, Zhang, Zhang	2018	<i>Sustainability (Switzerland)</i>
Davies, Chambers	2018	<i>Journal of Cleaner Production</i>
Dutta, Banerjee	2018	<i>Journal of Rural Studies</i>
Emami, Khajeheian	2018	<i>Sustainability (Switzerland)</i>
Fellnhöfer	2018	<i>Journal of Cleaner Production</i>
Fichter, Tiemann	2018	<i>Journal of Cleaner Production</i>
Fischer, Mauer, Brettel	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Gasbarro Rizzi, Frey	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Hahn, Spieth, Ince	2018	<i>Journal of Cleaner Production</i>
Hanohov, Baldacchino	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Hernández-Perlines, Cisneros.	2018	<i>Sustainability (Switzerland)</i>
Hörisch	2018	<i>Journal of Cleaner Production</i>
Ibrahim, Shuib, Ramachandran, Afandi	2018	<i>International Journal of Business and Society</i>
Ivanova, Latyshov	2018	<i>Entrepreneurship and Sustainability Issues</i>
Jerónimo Silvestre, Antunes, Leal Filho	2018	<i>Technological and Economic Development of Economy</i>
Johnsen, Olaison, Sørensen	2018	<i>Organization Studies</i>
Kiselitsa, Shilova, Liman, Naumenko	2018	<i>Entrepreneurship and Sustainability Issues</i>
Kraus	2018	<i>Sustainability (Switzerland)</i>
Kucharčíková	2018	<i>Sustainability (Switzerland)</i>
Kuril	2018	<i>Entrepreneurship and Sustainability Issues</i>
Lertwattanaruk, Sua-iam, Makul	2018	<i>Journal of Cleaner Production</i>
Marques, Gerry, Marques	2018	<i>European Planning Studies</i>
Meek, Sullivan	2018	<i>Journal of Developmental Entrepreneurship</i>
Muñoz	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Muñoz, Cacciotti, Cohen	2018	<i>Journal of Business Venturing</i>
Muñoz, Cohen	2018	<i>Business Strategy and the Environment</i>
Muñoz, Cohen	2018	<i>Journal of Small Business Management</i>
Mupfasoni	2018	<i>Journal of Small Business and Enterprise Development</i>
Nayak, Das, Kumar-Panigrahi	2018	<i>International Journal of Mechanical Engineering and Technology</i>
Neumeyer, Santos	2018	<i>Journal of Cleaner Production</i>
Nikolaou	2018	<i>Journal of Entrepreneurship</i>
Nikolaou	2018	<i>Management of Environmental Quality: An International Journal</i>
Padhi, Senapati, Priyabadini, Pradhan	2018	<i>International Journal of Mechanical Engineering and Technology</i>
Ploum, Blok, Lans, Omta	2018	<i>Organization and Environment</i>
Ploum, Blok, Lans, Omta	2018	<i>Journal of Cleaner Production</i>
Pohludka, Stverkova, Ślusarczyk	2018	<i>Sustainability (Switzerland)</i>
Porter, Orams, Lück	2018	<i>Tourism Planning and Development</i>
Ragulina, Semenova, Zueva, Kletsikova, Belkina	2018	<i>Entrepreneurship and Sustainability Issues</i>
Ratten	2018	<i>International Journal of Sociology and Social Policy</i>
Richardson	2018	<i>Strategic Change</i>
Roh, Choi	2018	<i>Asia Life Sciences</i>
Sarango-Lalangui	2018	<i>Sustainability (Switzerland)</i>
Schaltegger	2018	<i>International Journal of Entrepreneurial Venturing</i>
Soo Sung, Park.	2018	<i>Sustainability (Switzerland)</i>
St-Jean, Labelle	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Theodoraki, Messeghem, Rice	2018	<i>Small Business Economics</i>
Thompson	2018	<i>Sustainability (Switzerland)</i>
Thompson, Eijkemans	2018	<i>Sustainability (Switzerland)</i>
Tiemann, Fichter, Geier	2018	<i>International Journal of Entrepreneurial Venturing</i>
Tomy, Pardede	2018	<i>Sustainability (Switzerland)</i>
Triantafyllidou, Tsias	2018	<i>Journal for International Business and Entrepreneurship Development</i>
Tur-Porcar, Roig-Tierno, Mestre	2018	<i>Sustainability (Switzerland)</i>
Tvaronavičienė	2018	<i>Polish Journal of Management Studies</i>
Urbaniec	2018	<i>Polish Journal of Environmental Studies</i>
Vaicekauskaitė, Valackienė	2018	<i>Journal of Teacher Education for Sustainability</i>
Vargas Martínez, Bahena Álvarez, Cordón Pozo	2018	<i>Innovar</i>
Vlasov, Bonnedahl, Vincze	2018	<i>Journal of Enterprising Communities</i>
Vuorio, Puimalainen, Fellnhöfer	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Wahga, Blundel, Schaefer	2018	<i>International Journal of Entrepreneurial Behaviour and Research</i>
Yan, Gu, Liang, Zhao, Lu	2018	<i>Sustainability (Switzerland)</i>
York	2018	<i>International Journal of Entrepreneurial Venturing</i>
Zamora-Boza	2018	<i>Espacios</i>
Zeng	2018	<i>International Entrepreneurship and Management Journal</i>

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