

Article

# The Development of Sustainable Entrepreneurship Research Field

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**Abstract:** Sustainable entrepreneurship has received substantial recognition from academics and practitioners in the last decade, with a noticeable and rapidly increases of publications on the topic. Through bibliometric techniques and tools, this study allows mapping the main academic literature on sustainable entrepreneurship and analyzes the most substantial contributions to the advances of research in this field. The chronological analysis of literature from the Web of Science-Social Sciences Citation Index (WoS-SSCI) database—until January 2018—provides new insights not previously reviewed, such as the journals, authors and articles more influential so far. As a result, 282 articles were retrieved, which were published in 140 journals and written by 663 authors affiliated to 413 institutions, from 50 countries. The analysis allowed identifying publication evolution over time, and provides clues about the opportunities for future research.

**Keywords:** sustainable entrepreneurship; sustainability; sustainable opportunities; social entrepreneurship; environmental entrepreneurship

## 1. Introduction

Historically, an enterprise's success was explained almost exclusively based on its economic performance. The purpose of entrepreneurship research was to generate economic gains or, in some cases, to create employment sources. Those were the factors that traditionally would determine the entrepreneurship contribution to the territories development [1,2]. Therefore, value creation was commonly measured in economic-financial terms, by indicators such as sales, profit or returns on investment (ROI), and it was always exclusively understood as the maximization of individual profit [3]. In other words, entrepreneurship was committed to economic development and wealth generation [4,5] meanwhile, environmental and social issues were mostly avoided.

The issues related to the environmental and social role that enterprises play are not recent and have been the subject of discussion since the last century. For example, many scientists insist on the idea that the planet can not physically sustains for much longer the impact of current economic activity [6] However, over the last decade, the wish to understand the real impact and value of companies on society has grown exponentially. Indeed some authors talk about an economic paradigm shift [7]. The traditional understanding of value creation merely in terms of economic profit has extended to cover non-economic gains [8].

Following this path, an increasing number of researchers have started paying attention to the connection between sustainable development and entrepreneurship [9–11]. Sustainable entrepreneurship is nowadays a mainstream that began with sustainable management and entrepreneurial initiative and, in recent years, has received the attention of researchers from many

different academic backgrounds and perspectives [12,13]. The present research aims to bring light to the topic of sustainable entrepreneurship by understanding which is the most influential academic literature so far, where has been published and by whom. This knowledge enables new academics to have a lively and clear description of the relevant literature in this research field and to identify the international journals more sensitive with this topic. In order to achieve these objectives the article is structured as followed. The next theoretical section discusses about the concept of sustainable entrepreneurship. Then, in section three, it is explained the methodology applied to search the literature and to make the analysis. Section 4 presents the results and finally, in the Section 5, the authors discuss the results, suggest certain limitations and present the conclusions.

## 2. Sustainable Entrepreneurship Definition

Initially the research on sustainable entrepreneurship was basically focus on the entrepreneurial activity and its relationship with environmental problems and solutions [14]. Gradually the term was evolving to a broader approach closer to the idea discussed by Elkington, in 1997, the triple bottom line perspective [15]. As it was stated in the introduction, companies needed to be aware of their activity impact from an environmental and social point of view, not only using economic glasses. For this reason, it is evident that sustainable entrepreneurship has received much attention from different research domains, such as social entrepreneurship and environmental management research, which leads to a wide range of definitions too.

In general terms, there are two key perspectives on sustainable entrepreneurship. On the one hand, there are those academics that believe that any entrepreneurial activity must be subordinated to the relationship between sustainable entrepreneurship and the triple bottom line. Their researches are mainly published in sustainable management journals [16]. They concluded, “innovators and entrepreneurs will consider sustainable development as one of the greatest business opportunities in the history of trade” [17] (p. 25). These authors stress the link between sustainable development and entrepreneurship, pointing out that companies sustainability is attested by the main activities performed in their environments, impact evaluation, goal achievement, transparent communication of results, and that they must be oriented to the satisfaction of the people vital needs by applying the concept of creative destruction [18], as precondition and driving force in the transition to a more sustainable entrepreneurial ecosystem.

Therefore new ventures are key transformer of a sustainable economy, and their capacity to innovate can introduce more environmental and social solutions [19]. Sustainable entrepreneurship is able to generate employment, enhances products and processes, and sets up new companies and changes people’s lives. It is not only about the exploration of opportunities and market threatens, but also about consciously analyzing the social, economic and environmental impact that corporations’ performance is having on territories. Between the typology of the companies, it is important to highlight the role that, in general, small and medium sized enterprises play in the percentage of employment in most countries around the world [20]. The individual impact generated by SMEs is relatively small, but their collective impact is substantial and indispensable for most of the regions. Frequently SMEs represents around 95% and due to their more limited resources, their understanding of sustainable practices may differ from large enterprises [21].

On the other hand, there are those academics that support the concept of triple bottom line with a perspective of entrepreneurial processes [22,23] and emphasize the relationship that must exist between individuals and opportunities. Accordingly entrepreneurs are absolutely aware of the impact that their companies directly or indirectly have on the environment [24]. Based on this idea, sustainable entrepreneurship is defined as “*the examination of how opportunities will bring into existence future goods and services as discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences*” [9] (p. 58). This approach understands that the sustainable development is the most important source of business opportunities in the long term and where the potential entrepreneur can find durable business models.

A common characteristic is the attention to the different phases of entrepreneurial opportunity: discovery, creation, evaluation, and exploitation [22,25,26]. Hence, these definitions of sustainable entrepreneurship use a process approach instead of focusing on the individual entrepreneur, emphasizing an action-oriented perspective [27]. Furthermore they assume a certain type of consequences from entrepreneurial activity. These impacts are exposed either in general terms, like “... transformation of a sector towards an environmentally and socially more sustainable state” [25] (p. 482); or specifying certain outcomes, such as “... preservation of nature, life support, and community” [26] (p. 58). The Appendix A shows the main definitions of sustainable entrepreneurship published in the most influential scientific journals that address this topic.

In the last four years we found three interesting literature reviews that help to understand the increase importance of this topic during the last decade. Specifically the two latest were published in the two more prolific journals in this topic, Journal of Cleaner Production and Sustainability. The article “Sustainable Entrepreneurship: A Current Review of Literature”, by [28], evidences the increasing interest that sustainable entrepreneurship has gained and how it has become an influential concept in entrepreneurship despite of it is still a controversial and ambiguous concept. On their behalf, the authors of the article “Sustainable Entrepreneurship Orientation: A Reflection on Status-Quo Research on Factors Facilitating Responsible Managerial Practices” [29], identify three relevant levels in the successful implementation of sustainable management practices: individual, organizational and contextual. Some interesting conclusion of this paper point out that, on the individual level, entrepreneurs tend to derive their purpose of acting in a more sustainable way based on personal values and traits. On the organizational level, internal corporate culture and resources reconfiguration are critical determinants to embrace a sustainable orientation. Lastly, on the contextual level, researchers focus on how entrepreneurs can help society and the environment by means of sustainable entrepreneurship. Finally, in their article “Doing business in a green way: A systematic review of the ecological sustainability entrepreneurship literature and future research directions”, [30] suggest that sustainable entrepreneurship research should focus on understanding the qualitative and quantitative dimensions of networks and how they mitigate the financial and market challenges. This knowledge would help to understand the best practices of the new sustainable ecological enterprises and the main challenges that established SMEs have to face.

### 3. Materials and Methods

A bibliometric study uses data and bibliographic indicators in order to both outline the scientific production development [31] and to analyze the relevant literature from a specific field [32]. The whole field of bibliometric includes quantitative aspects and models of scientific communication, storage, dissemination, and data retrieval [33]. Hence, bibliometric studies have been also applied to measure the impact of published works, counting the number of citations found in different areas of knowledge [34]. Besides, a bibliometric study provides essential information to the analysis of quantitative data from the selected works [35], which allow identifying the characteristics of the current research on a subject, past trends and future directions/possibilities. In order to achieve the purpose to bring light to the topic of sustainable entrepreneurship, the research questions for this review are:

- How is characterized the chronological development of the topic (publications over time)?
- What are the most relevant journals on the topic (by two indicators: the number of papers published on sustainable entrepreneurship and the number of citations)?
- What are the most influential authors on the topic (by two indicators: the number of papers published on sustainable entrepreneurship and the number of citations by papers)?
- What are the most relevant articles on the topic?

To carry out the present study, procedures and techniques similar to those used in other bibliometric studies and systematic reviews of literature were adopted [36]. Two phases were defined: (2.1) Literature Search and (2.2) Analysis of literature.

### 3.1. Phase 1: Literature Search

The articles search was performed on WoS-SSCI database, and all the available and complete years until the time of the investigation were considered: from 1956 to 2018. WoS-SSCI is one of the most complete scientific information databases available online; it is composed by magazines/journals reviewed by recognized researchers from the international scientific community, focused on scientific and academic production related to applied social sciences and contains indicators such as citation frequency [36,37].

To conduct the search for literature on sustainable entrepreneurship, indexed in WoS-SSCI database, keywords were identified to allow retrieving related articles. The search for keywords is a useful procedure to ensure the objectivity and replicability of the process of recollection and localization of documents for bibliographic reviews. Initially, the WoS-SSCI list of subject terms (thesaurus) was consulted in order to identify synonyms related to the research. Titles, abstracts, keywords and citations [9,19,22] among others, were also consulted [25,26,29]. Fifty keywords that can be used as research terms were listed by using these procedures (including variations such as plural, singular and others) [38,39]. Among these words are: sustainable: “sustainable entrepreneurship” (or “sustainability entrepreneurship”), “sustainable entrepreneurial opportunity/ies”, “sustainable opportunity (or “sustainable opportunities”), among others, such as, “ecological sustainability entrepreneurship”-“green”, “sustainable”, “ecological”, “environmental”, “entrepreneur\*” (including entrepreneur, entrepreneurial, entrepreneurship), “ecopreneur\*” (ecopreneur, ecopreneurial, ecopreneurship), “enviropreneur\*” “social/environmental/economic entrepreneurship”, (enviropreneur, enviropreneurial, enviropreneurship)-“conventional entrepreneurship”, “economic goals; social goals; ecological goals” among others (see Figure 1).



**Figure 1.** Keywords of sustainable entrepreneurship research field.

In order to know if an article would fall under the scope of the present bibliographic study, each word was individually searched on WoS-SSCI database and every result of the search—titles, summaries—was observed. After these first procedures, the main keywords used as search terms was “sustainable entrepreneurship” (or “sustainability entrepreneurship”) to derive similar works. These terms were searched under Topic (title, summary and/or keywords from literature indexed in WoS-SSCI). Only articles (or reviews) in English and the research areas: business, economics, environmental sciences, ecology, science, technology engineering, public administration, social sciences, were included.

Considering that the discussion of the differences between the terms “sustainable entrepreneurship” and “sustainability entrepreneurship” is not the purpose of this work, some criteria for inclusion and exclusion of articles were adopted. The inclusion criteria for selection of articles were: (1) articles from journals reviewed by peers; (2) business economics or environmental sciences ecology or science technology, other topics on engineering or public administration or social sciences); (3) every single article published between 1992 and 2018; (4) conceptual articles; (5) empirical studies. We decided the exclusion of (1) articles that did not come from journals reviewed by peers; (2) articles that were not related to entrepreneurship; (3) articles that were not related to sustainability.

From these procedures were found 282 publications in 29 January 2018 (date that should be considered as a reference for accounting of the citation frequencies where mentioned). Therefore, the search for literature that has been performed is restricted to scientific literature on sustainable entrepreneurship, without considering its differences or similarities with other terms.

### 3.2. Phase 2: Analysis of the Literature

From the 282 articles previously identified, we sought to identify papers that could be considered relevant on the topic sustainable entrepreneurship. In order to achieve it, two groups of articles were created following two paths. Initially, articles were selected articles based on the indicator of scientific impact based on an analysis of the citations received by articles. Thus, the group 1 allows identifying articles that have been cited by other works on the sustainable entrepreneurship research field. These works—identified by the number of citations—can be seen as “central” articles and relevant to be examined by researchers who are not familiar with the subject and, moreover, serve as initial literature for review of a new topic associated with the topic researched [40]. Considering the criterion of counting citations allows retrieving studies that have been cited by others over the years, means that the older the date of publication of an article is, the more likely it is to accumulate citations when compared with a recently published article. To deal with this bias and identify relevant articles published in recent years group 2 was formed. The main criteria used to select the articles in each of the groups are described below:

**Group 1**—At first, all works were listed in descending order, according to the citation frequency. The bibliometric indicator GCS (Global Citation Score), which shows the number of times the article is cited in the SSCI (Social Science Citation Index) database, was used. The first 47 articles were selected considering the average of 25 citations. After reading titles and abstracts from these 47 articles we select those that sustainable entrepreneurship is the central theme. The group was reduced to 13 articles, which were read and reviewed.

**Group 2**—Most recent articles: initially were selected articles published in the last years: 2015 and 2018 (a total of 147 articles). Since they were recent works, where the number of citations are neither significant nor can be used to select relevant articles on a subject [30], the selection criterion was based on the publication in high impact journals (based on the number of citations). The list of journals used as a reference to carry out this selection is shown in the result section. A total of 39 articles were selected.

A total of 52 articles from groups 1 and 2 were identified. The main results are presented and discussed in the next section.

## 4. Results

282 articles on sustainable entrepreneurship were retrieved after a search on Web of Science—Social Sciences Citation Index (WoS-SSCI) database. These articles were published in 140 journals and written by 663 authors from 413 institutions in 50 different countries. We also observed that these 282 articles used 15,945 bibliographic references, an average of 56.54 references per article. Table 1 shows an overview of general results (bibliographic data) obtained in the research.

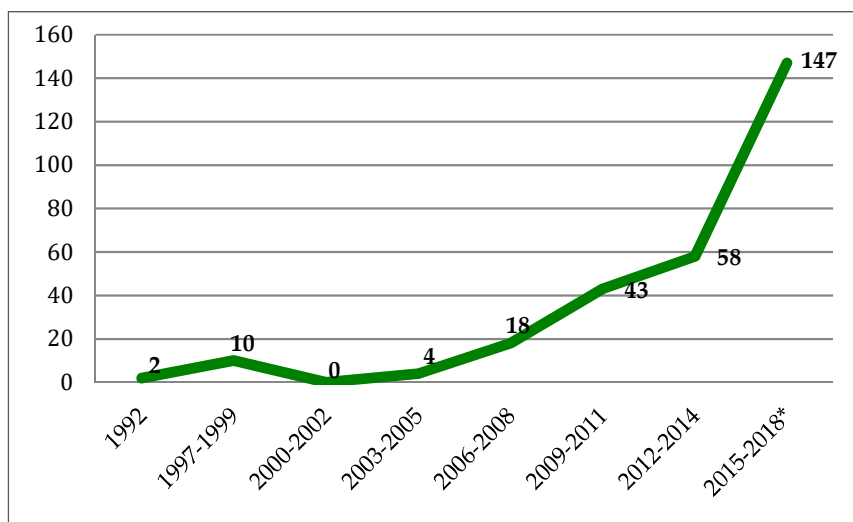


**Table 1.** General results: Publications on sustainable entrepreneurship.

Elements	Quantity
Articles	282
Journals	140
Authors	663
Institutions (author affiliation)	413
Countries	50
References	15945

Note: Value estimated based on data until 29 January 2018. Source: Social Science Citation Index-SSCI/Web of Science.

With regard to the distribution of publications over time (Figure 2), we verified that, during the period available in the database (from 1992 to 2017, extended to 29 January 2018), the first two works on sustainable entrepreneurship were published in 1992, 10 works from 1997 to 1999, works from 2000 to 2002 -which seems odd-, 4 works from 2003 to 2005, 18 works from 2006 to 2008, 43 works from 2009 to 2011, 58 works from 2012 to 2014. Finally, 147 works have been published from 2015 until 29 January 2018.



**Figure 2.** Chronologic distribution of publications on sustainable entrepreneurship. Note: Value estimated based on data until 29 January 2018. Source: Social Science Citation Index-SSCI/Web of Science

Among the 140 journals containing works on sustainable entrepreneurship, we sought to identify the most relevant for this research. Both the number of articles published in each journal and the number of citations were considered as indicators. Table 2 shows the list of the main journals according to the number of articles on sustainable entrepreneurship. It also shows the citation frequency for these journals, measured by TGCS (Total Global Citation Score), which means the number of times the journal is cited in the SSCI (Social Science Citation Index) from the published articles on the subject. These journals (Table 2) have published 109 articles on sustainable entrepreneurship, which represents the 39% of the total. The four journals with the highest number of published articles, over 10 works each, are Journal of Cleaner Production, an international journal, with 23 articles; Sustainability, with 22 articles; Business Strategy and The Environment, with 11 articles; and Journal of Business Venturing, with 10 articles. These results allow us to infer that the editorial line of these journals reflects an interest in this specific topic and, otherwise, researchers recognize these journals as relevant channels to communicate their findings in the research field.

In order to identify the journals with the highest impact, the 140 journals were listed in descending order, in accordance to the citation frequency by TGCS (Total Global Citation Score). A total 7172 citations (from the 282 articles in the 140 journals) in the SSCI database was identified, an average of 25 citations received per journal. It suggests that sustainable entrepreneurship researchers often use articles that have been published in these journals when quoting documents on this topic (Table 3). Altogether, the papers of these journals were cited 4962 times, which represents the 69% of the 7172 citations. Tables 2 and 3 shows that Journal of Cleaner Production has the highest number of publications on the topic (23 articles), and 223 citations. The journal Sustainability, which comes in second place in the ranking (22 articles) comes in tenth place among the journals with the highest impact (33 citations). Meanwhile, three journals with 11, 10 and 8 articles each (see Table 3) are among the most cited when it comes to sustainable entrepreneurship. They are Business Strategy and The Environment, Journal of Business Venturing, Journal of Business Ethics, Journal of Management Studies, Journal of Organizational Change Management, Organization & Environment, total 54 articles and 1996 citations. Finally, journals with five articles, Small Business Economics and Sustainable Development, have 88 citations together.

**Table 2.** Most important journals on sustainable entrepreneurship sorted by citation frequency.

Journals	Quantity of Articles	Citations *
Journal of Cleaner Production	23	223
Sustainability	22	33
Business Strategy and The Environment	11	307
Journal of Business Venturing	10	925
Journal of Business Ethics	9	213
Journal of Management Studies	8	79
Journal of Organizational Change Management	8	363
Organization & Environment	8	109
Small Business Economics	5	37
Sustainable Development	5	51
Total (specific)	109	2340
Percentage of total **	39%	33%

Note: \* (29 January 2018) by TGCS—Total Global Citation Score. \*\* Total: 282 articles and 7172 citations. Source: Data collected from Social Sciences Citation Index—SSCI/Web of Science.

**Table 3.** Top 10 journals sorted by citation frequency in the collection on sustainable entrepreneurship.

Journals	Quantity of Articles	Citations *
Strategic Management Journal	2	2055
Journal of Business Venturing	10	925
Journal of Marketing	1	365
Journal of Organizational Change Management	8	363
Business Strategy and The Environment	11	307
Journal of Cleaner Production	23	223
Journal of Business Ethics	9	213
Journal of Management	2	200
Journal of the Academy of Marketing Science	2	184
Academy of Management Perspectives	1	127
Total	69	4962
Percentage of total **	24%	69%

Note: \* (29 January 2018) by TGCS—Total Global Citation Score. \*\* Total: 282 articles and 7172 citations. Source: Data collected from Social Sciences Citation Index—SSCI/Web of Science.

Table 4 lists the authors with the highest number of publications on sustainable entrepreneurship. Their works represent the 6% of the total number of articles that have been identified in this study (17 of 282). These authors are affiliated to institutions from different countries, such as United States, Canada, Germany and Rumania. The list of all the represented countries does not include any South American country. In general, the 3% of institutions represented by the authors, with works,

which have been reviewed in this study, are located in the United States (38%), Canada (19%), Germany, Rumania and New Zealand (43%). The countries where the institutions with the most prolific authors are located (Table 5) may be diverse, but it is not in the case of authors with the highest citation frequency: The 10 most cited authors are researchers affiliated to institutions located in the United States, with exception of four authors: Wagner M (University of Wuerzburg, Germany), Schaltegger S (University of Lueneburg, Germany) and Cohen B & Winn MI (University of Victoria, Canada).

**Table 4.** Authors with the largest amount of publications on sustainable entrepreneurship.

Authors	Quantity of Articles *	Institutions (Author's Affiliation)	Country
Shepherd, D.	4	Baylor University	USA
Shrivastava, P.	4	Concordia University	Canada
York, J.	4	University of Virginia	USA
Patzelt, H.	3	Technical University of Munich	Germany
Vatamanescu, E.	3	Bucharest University	Rumania
Walton, S.	3	University of Otago	New Zealand

Note: (\*) 29 January 2018. Source: Data collected from Social Sciences Citation Index–SSCI/Web of Science.

**Table 5.** Most cited authors on sustainable entrepreneurship journals.

Authors	Quantity of Articles	Citations *	Institutions (Author's Affiliation)	Country
Menon, A.	2	730	Colorado State University	USA
Dean, T.	2	289	University of Colorado	USA
Wagner, M.	2	281	University of Wuerzburg	Germany
McMullen, J.	2	236	Indiana University	USA
Cohen, B.	2	221	University of Victoria	Canada
Winn, M.	1	219	University of Victoria	Canada
Schaltegger, S.	2	207	University of Lueneburg	Germany
York, J.	4	199	University of Virginia	USA
Ireland, R.	1	190	Baylor University	USA
Ketchen, D.	1	190	Auburn University	USA

Note: (\*) 29 January 2018. Source: Data collected from Social Sciences Citation Index–SSCI/Web of Science.

Table 5 also shows authors (Winn M, Ireland, R and Ketchen, D) who have published 1 article (219 citations). The author York, J. have published 4 articles and Menon, A; Dean, T; Wagner, M., McMullen, J., Cohen, B. and Schaltegger, S. have published 2 articles each. Both Menon, A. and Dean, T. are among the authors with an average of 2 articles on the topic (Table 5) and most cited authors that have been included in the collection analyzed in Table 5 are the main authors of the highly cited papers. These authors have accumulated 2762 citations on sustainable entrepreneurship.

Bibliometric study shows a chronological list of publications on sustainable entrepreneurship a multitude of definitions, terminologies such as: Ecopreneurship, Environmental Entrepreneurship, Sustainable Development Entrepreneurship, Sustainable Entrepreneurs and Green Entrepreneurship has been used up interchangeably in the documents reviewed during the investigation [41–43]. On the other hand, we must express that each terminology is linked to ecological entrepreneurship that seeks to understand how business action can help preserve the natural environment [44,45]. In the last decade, sustainable entrepreneurship has been promoted in the most important journals of sustainable management with substantive and quality research that address regional and international experiences. Sustainable entrepreneurship became popular in the field of business initiatives and caused the interest from the economic, political, social media and naturally of the academic with social and environmental focus.

Furthermore, research in sustainable entrepreneurship involves the social, economic and environmental environment, but emphasizes the development of non-economic gains for individuals and societies [46]. It also includes aspects of corporate social responsibility (CSR), which refers to



actions to promote social goods, beyond the interest of the company [47]. By businesses to be profitable at the same time, they must have sustainable objectives focused on reducing climate change, preserving the ecosystem, counteracting environmental degradation, deforestation and above all, improving good agricultural practices, drinking water and the environment.

Finally, research on sustainable entrepreneurship is considered a unique perspective that combines the creation of economic, social and environmental value, with a general concern for the welfare of future generations. Many researchers watch an entrepreneurial activity as sustainable when integrating holistic economic, social and environmental goals that persist over time and generate wealth over time for an organization to consider it self a sustainable development company [10,48,49].

The papers included in Table 6 are the most cited articles on sustainable entrepreneurship, which were identified from the indicator GCS (Global Citation Score)—number of times the paper is cited in the SSCI (Social Science Citation Index) database. After the analysis performed on 13 articles, which are among the most cited, several relevant aspects, that have been discussed in the literature and can help to understand the topic of sustainable entrepreneurship, were identified. In general, some documents provide an explicit definition of sustainable entrepreneurship. Following a chronological order we'll begin our analysis with the author [50], who introduces the terms "environmental concerns" and their effect on the corporate competitive landscape, by incorporating market size variables (sales) and environmental awareness, with his article "Enviropreneurial marketing strategy: The emergence of corporate environmentalism as market strategy". Later on, [17] in his article "Global sustainability and the creative destruction of industries", focus on "how creative destruction happens", which was not competitive in the XIX siecle, fostered by sustainability, can increase corporate gains. Afterward, there are authors such as [22], in his article titled "Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action" explained how entrepreneurship can help resolve the environmental problems of global socio-economic systems and suggested that environmental market failures represent opportunities for achieving profitability.

Another author [9], in his article titled "Market imperfections, opportunity and sustainable entrepreneurship" analyses the relationship between market imperfections and entrepreneurial opportunities and between organizations and natural environment. He concludes that identification and exploitation of market imperfections in the natural environment enables the attainment of entrepreneurial rents and, simultaneously, of more sustainable markets. Afterward, in his article [41] "Ecopreneurship—a new approach to managing the triple bottom line" identifies a strong link between entrepreneurial initiative and environment. He concludes that entrepreneur's style allows the achievement of environmental, social and economic goals. Furthermore, in his article "Green Management Matters Regardless", the author [51] states that from a moral or normative perspective the obligation for green management is absolute. Also, in his article [52] "The Concept of Opportunity in Entrepreneurship Research: Past Accomplishments and Future Challenges", he put emphasis on the comprehension of the nature of opportunities, its causes, effects and processes in order to reach sustainability [25], in his article "Greening Goliaths versus emerging Davids—Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship", suggests that an ambidextrous innovation policy that can simultaneously pursue incremental and disruptive innovation is needed in order to achieve sustainability.

In this article "The entrepreneur-environment nexus: Uncertainty, innovation, and allocation" [53] also concludes that environmental issues clearly represent the kind of opportunity that entrepreneurs can take to orient themselves to sustainability and that environmental entrepreneurship is more effective for the new profit seeking companies. In addition, in his article [54] "The influence of sustainability orientation on entrepreneurial intentions—Investigating the role of business experience", stated that, the individual sustainability orientation of entrepreneurs could contribute to the understanding of both entrepreneurial intentions and the impact of entrepreneurial experience. Moreover, [19] in his article Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions claims that the degree of environmental or social responsibility orientation in the

company is assessed on the basis of environmental and social goals and policies, the organization of environmental and social management and the communication of environmental and social issues. Along with this line of thought, [46], in his article “The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking. “What Is to Be Sustained” With “What Is to Be Developed”, claims that Sustainable entrepreneurship 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 construed as a whole. Finally, [55] in his article “Sustainability-oriented innovation of SMEs: a systematic review” concludes that proactive behaviors result in greater sustainability-oriented innovation capabilities and, therefore, in a better interaction with stakeholders, which increases innovation capabilities and improves organizational dynamics.

**Table 6.** Most cited articles on sustainable entrepreneurship.

Authors	Article Title	Journal	Citations *
Menon, A.	Enviropreneurial marketing strategy: The emergence of corporate environmentalism as market strategy	Journal of Marketing	365
Dean, T.	Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action	Journal of Business Venturing	224
Cohen, B.	Market imperfections, opportunity and sustainable entrepreneurship	Journal of Business Venturing	219
Schaltegger, S.	Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions	Business Strategy and the Environment	197
Short, J.	The Concept of Opportunity in Entrepreneurship Research: Past Accomplishments and Future Challenges	Journal of Management	190
Hockerts, K.	Greening Goliaths versus emerging Davids: Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship	Journal of Business Venturing	147
Alfred, A.	Green Management Matters Regardless	Academy of Management Perspectives	127
Hart, S.	Global sustainability and the creative destruction of industries	Sloan Management Review	114
Klewitz, J.	Sustainability-oriented innovation of SMEs: a systematic review	Journal of Cleaner Production	105
York, J.	The entrepreneur–environment nexus: Uncertainty, innovation and allocation.	Journal of Business Venturing	95
Shepherd, D.	The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking What Is to Be Sustained With What Is to Be Developed	Entrepreneurship Theory and Practice	92
Kuckertz, A.	The influence of sustainability orientation on entrepreneurial intentions: Investigating the role of business experience	Journal of Business Venturing	84
Dixon, S.	Ecopreneurship: a new approach to managing the triple bottom line	Journal of Organizational Change Management	71

Note: (\*) 29 January 2018. Source: Data collected from Social Sciences Citation Index—SSCI/Web of Science.

Table 7 lists the 39 articles that were classified during the period of 2015–2018. These articles help to understand which are the advancements in sustainable entrepreneurship research. Literature searches were performed in order to know which are the types of research, gaps, future lines of research and the most recent and relevant aspects of the topic addressed in this bibliometric study.

An approach to sustainable entrepreneurship relies on three specific analytical dimensions [55]: (1) the purpose of the initiative; (2) its form of organization and ownership; and (3) its embeddedness into local community or social movements. Besides, [30] refers to the fragmented and inconsistent findings in the field of sustainable entrepreneurship and the variety of terms used in it, such as ecopreneurship, environmental entrepreneurship, environment and green entrepreneurial spirit. Also, [56] claims that translating a sustainability message into a tangible product involves the support of three techniques: preservation, transformation and adding novelty. Other authors [44] [57–60] refer to the key findings that the triple bottom line of ecological, social and economic goals is integrated sequentially, not simultaneously, that is to say, sustainable entrepreneurs must: (1) be motivated by identities based on both commercial and ecological logics; (2) prioritize commercial and/or ecological goals; and (3) approach stakeholders in a broadly inclusive, exclusive, or co-created manner in order to acquire financial resources through crowdfunding, because sustainable entrepreneurs do not seem to be ready to respond to the challenges or to take any risks by investing in green business, but also that the government and educational institutions do not recognize their own role and the need of supporting the development of green entrepreneurship.

However, ref. [61] claims that future studies should further connect sustainable and institutional entrepreneurship research, and take group and individual factors into account when explaining how sustainable entrepreneurs engage in institutional change. Thus, the green entrepreneurial spirit is a personal drive, a mission, a location and a future orientation in terms of sustainability. Sustainable entrepreneurs create new symbols, construct new measures, build consensus, and forge new relations to alter or create new institutions. In addition, entrepreneurial collaboration has three feedback effects: it creates accessible modes, diversity of scope, and an increased scale of institutional change strategies. Finally, sustainable entrepreneurs that act by themselves intend to engage in institutional change strategies to increase the adaptability to complaints by using their interpersonal nets.

**Table 7.** Recent articles selected in the collection on sustainable entrepreneurship.

Authors	Article Title	Journal
Kraus, S.	Sustainable Entrepreneurship Orientation: A Reflection on Status-Quo Research on Factors Facilitating Responsible Managerial Practices	Sustainability
Fellnhöfer, K.	Drivers of innovation success in sustainable businesses	Journal of Cleaner Production
Kraus, S.	Configurational paths to social performance in SMEs: The interplay of innovation, sustainability, resources and achievement motivation	Sustainability
Ceptureanu, E.	Empirical Study on Sustainable Opportunities Recognition. A Polyvinyl Chloride (PVC) Joinery Industry Analysis Using Augmented Sustainable Development Process Model	Sustainability
Zhang, J.	Eco-innovation and business performance: the moderating effects of environmental orientation and resource commitment in green-oriented SMEs.	R and D Management
Hsu, C.	Identifying key performance factors for sustainability development of SMEs—integrating QFD and fuzzy MADM methods	Journal of Cleaner Production
Criado-Gomis, A.	Sustainable Entrepreneurial Orientation: A Business Strategic Approach for Sustainable Development	Sustainability
Ramos-González, M.	Building corporate reputation through sustainable entrepreneurship: The mediating effect of ethical behavior	Sustainability
Peñalvo-López, E.	A methodology for analyzing sustainability in energy scenarios	Sustainability

**Table 7.** Recent articles selected in the collection on sustainable entrepreneurship.

Authors	Article Title	Journal
Afshar Jahanshahi, A.	Who takes more sustainability-oriented entrepreneurial actions? The role of entrepreneurs' values, beliefs and orientations	Sustainability
Iyer, E.	The Intersection of Sustainability, Marketing, and Public Policy: Introduction to the Special Section on Sustainability	Journal of Public Policy & Marketing
Li, Y.	The study on ecological sustainable development in Chengdu	Physics and Chemistry of the Earth
De Lange, D.	Start-up sustainability: An insurmountable cost or a life-giving investment?	Journal of Cleaner Production
Hernández-Perlines, F.	Sustainable entrepreneurial orientation in family firms	Sustainability
Ceptureanu, S.I.	Toward a Romanian NPOs sustainability model: Determinants of sustainability	Sustainability
Gasbarro, F.	The Interplay Between Sustainable Entrepreneurs and Public Authorities: Evidence From Sustainable Energy Transitions	Organization and Environment
Magnani, N.	Ecopreneurs rural development and alternative socio-technical arrangements for community renewable energy	Journal of Rural Studies
DiVito, L.	Entrepreneurial orientation and its effect on sustainability decision tradeoffs: The case of sustainable fashion firms	Journal of Business Venturing
Provasnek, A.	Sustainable Corporate Entrepreneurship: Performance and Strategies Toward Innovation	Business Strategy and the Environment
Corbett, J.	Environmental Entrepreneurship and Interorganizational Arrangements: A Model of Social-benefit Market Creation	Strategic Entrepreneurship Journal
Stubbs, W.	Sustainable Entrepreneurship and B Corps	Business Strategy and the Environment
Leonidou, L.	Internal Drivers and Performance Consequences of Small Firm Green Business Strategy: The Moderating Role of External Forces	Journal of Business Ethics
Santini, C.	Ecopreneurship and Ecopreneurs: Limits, trends and characteristics	Sustainability
Sarkar, S.	Sustainability-driven innovation at the bottom: Insights from grassroots ecopreneurs	Technological Forecasting and Social Change
Lapinskienė, G.	Testing environmental Kuznets curve hypothesis: the role of enterprise's sustainability and other factors on GHG in European countries	Journal of Business Economics and Management
Poldner, K.	Embodied Multi-Discursivity: An Aesthetic Process Approach to Sustainable Entrepreneurship	Business and Society
De Lange, D.	Increasing sustainable tourism through social entrepreneurship	Internat. Journal of Contemporary Hospitality Management
Poldner, K.	Aesthetic mediation of creativity, sustainability and the organization	Journal of Cleaner Production
Klewitz, J.	Grazing, exploring and networking for sustainability-oriented innovations in learning-action networks: an SME perspective	Innovation
Swanson, K.	A theoretical framework for sustaining culture: Culturally sustainable entrepreneurship	Annals of Tourism Research
Hörisch, J.	What influences environmental entrepreneurship? A multilevel analysis of the determinants of entrepreneurs' environmental orientation	Small Business Economics

**Table 7.** Recent articles selected in the collection on sustainable entrepreneurship.

Authors	Article Title	Journal
Gast, J.	Doing business in a green way: A systematic review of the ecological sustainability entrepreneurship literature and future research directions	Journal of Cleaner Production
Belz, F.	Sustainable Entrepreneurship: A Convergent Process Model	Business Strategy and the Environment
Calic, G.	Kicking Off Social Entrepreneurship: How A Sustainability Orientation Influences Crowdfunding Success	Journal of Management Studies
O'Neill, K.	Rethinking green entrepreneurship—Fluid narratives of the green economy	Environment and Planning A
York, J.	Exploring Environmental Entrepreneurship: Identity Coupling, Venture Goals, and Stakeholder Incentives	Journal of Management Studies
Waldron, T.	How Social Entrepreneurs Facilitate the Adoption of New Industry Practices	Journal of Management Studies
Hunt, R.	Intergenerational Fairness and the Crowding Out Effects of Well-Intended Environmental Policies	Journal of Management Studies
Steinz, H.	How to Green the red Dragon: A Start-ups' Little Helper for Sustainable Development in China	Business Strategy and the Environment

## 5. Discussion

The flood of literature on sustainability is among the main findings of this bibliometric study on sustainable entrepreneurship. The first articles appear at the beginning of the 90s, after 2006 the number of articles on this topic increases significantly. The data reflects that this growth has not stopped and that the topic of sustainable entrepreneurship is still a developing stream of research. Hence, the existence of a diversity of definitions to describe it is not surprising.

A remarkable result of bibliometrics is that the articles that were published in impacting journals found a common ground on how to define sustainable entrepreneurship and terms related to environment, such as: "green", "sustainable", "ecological", "environmental", "entrepreneurial" "ecopreneur\*" "ecopreneur" "enviropreneur\*" "Environmental Entrepreneurship" "Ecological Goals" "Economic Entrepreneurs", etc. Hence, this study reveals the importance of equilibrating the economic, social and ecological achievements in sustainable organizations, by making use of the source and the creation of sustainable entrepreneurial opportunities.

When aiming to really understand the research field and be able to provide theoretical and practical contributions, quality scientific research requires the access to knowledge accumulated in previous studies on the specific topic. Thus, this study contributes to developing the entrepreneurship research by performing a bibliometric review of scientific literature with the help of one of the most recognized databases, Web of Science-Social Sciences Citation Index. Besides, the present work can be a guide for future researchers, especially for those who are not familiar with sustainable entrepreneurship.

By providing the chronological distribution of publications, this work allows the systematic review of scientific literature on the topic over time. The first two works that were retrieved from the database were published in 1992, and from 1997 to 1999 10 works were published. From 2000 until now 282 documents on sustainable entrepreneurship have been published, which confirms, what other researchers pointed out, that collaboration within the sustainable entrepreneurship context is a relatively new concept that has attracted the scientific community's interest after 2005. The increasing interest and relevance is proved by the significant rise in the number of publications from the year 2006 until now (considering the final date, 29 January, when this work was finished).

The present bibliometric study also allows the identification of the most prominent journals and works in the research field of sustainable entrepreneurship. Two lists of journals were provided:



(i) Journals with the highest number of articles and (ii) the most cited journals (high impact journals). The results reflect that most articles were published in *Journal of Cleaner Production*, *Sustainability*, *Business Strategy* and the *Environment Journal of Business Venturing*. Articles that stand out in the area, documents with a high number of citations and documents that have been published in high impact journals in the last two years are also listed. All the provided lists enable researchers to start up or move forward on their research and get acquainted with the most prominent works in the field, that is to say, those high-impact documents that other researchers have used to support their research.

Different lines of research, that may be useful for future researches on sustainable entrepreneurship, have been identified in the context of our bibliometric review. On the one hand, there is the need for theoretical development. Although there is a big number of conceptual works on sustainable entrepreneurship, there are some authors that still develop theoretical models [13,23] form a framework in order to detect sustainable development opportunities [56]. Current theories and empirical studies suggests a causal model, with the identification of sustainable development opportunities as a variable dependent on environmental and community awareness and the insertion of a moderating variable such as corporate knowledge. Sustainable entrepreneurship must focus on the sustainable systems' features that tend to be complex, disperse, global, uncertain, and interdependent and have long-term horizons. The differential role of large and small companies in the transformation towards sustainable development can't be neglected. That is to say, it is about understanding the nature of opportunities, its causes and effects by means of empirical studies [52].

Other important factors to carry out future researches are motivations for innovation and sustainable entrepreneurship models, which need to be adjusted to the corporate environment [19] through different perspectives, in order to explore variables that focus on nature and lifestyle [23] and that should strengthen the connection between sustainable institutional entrepreneurship research and institutional entrepreneurship research [60]. Besides, the directly proportional relationship between uncertainty and innovation opportunities must be analyzed by performing empirical tests on social entrepreneurship initiatives in the field of sustainable energies [57] and by analyzing how ecologically sustainable entrepreneurs and their companies influences communities and society [30], since social and ecological factors can be a source of business opportunities [44]. This document also provides an exhaustive analysis of the selected works, showing possible gaps and opportunities for new researches on sustainable entrepreneurship. Interested researchers could use the provided information and results to conduct their investigations.

Academics should focus on knowing how sustainable enterprises develop their roadmap to search by social and environmental impacts that materialize through good practices developed in their environments [26]. However, research shows that the literature on practices in sustainable entrepreneurship is a heavy gap for future research, that measurement mechanisms are used in the practices and monitor the change over time, since companies operate in unfavorable environments by affectation of external agents as political and economic factors [62,63]. Challenging tasks by researchers would be to diagnose practices and research because of the complexity of quantifying and the perception of social and environmental impact differences [64]. While it is a challenge, this begins avenues for future research on measuring impact and accountability [65–67].

By advance within the framework of the understanding of sustainable entrepreneurship, future research should focus on how sustainable entrepreneurs interact and form associations with communities of a social nature [68]. When interacting with others, sustainable companies create new identities and cooperate categories [69]. Some companies are formalized through certifications such as: B Corps, Rainforest Alliance or Fairtrade [70]. Finally, it is essential to understand how sustainable enterprises they create value beyond the limits of the enterprises, contributing positively to social and ecological systems.

### Limitations

Bibliographic studies allow retrieving and condensing large amounts of bibliographic information, however, they have some limitations. The limitations of this study are at least related to two issues that are intrinsically connected: (i) the variance in human judgment and (ii) the characteristics of both the database and the citation frequency used in this analysis. The use of just one database, although justified, is a human decision, which shows an obvious scope limitation, due to the fact that it contains just a sample of article. Hence, the reviewed publications represent merely a part of the scientific production on the topic; so general conclusions can't be drawn. Researches that have been published in other databases and languages (Spanish among them) are not represented here. Database properties—indexed journals, citations counting, and indexing references—also affect directly the process of retrieving and selecting publications and, therefore, the results.

As previously described (phase 2: Systematic Analysis), citation frequency was used to select articles relevant to the analysis and research illustration. In order to minimize the bias, this study has only considered articles on the specific topic of sustainable entrepreneurship, considering the whole amount of citations that each article have in WoS-SSCI (a database that contains articles on many different topics and fields). Similarly, citations from the WoS-SSCI (indicator TGCS—Total Global Citation Score) were used to identify and selected journals that focuses on the topic, instead of using Journal Impact Factor (which shows the number of citations found in scientific and social journals [71], regardless of the topic).

Human judgment is required to determine how many articles and journals must be included as data sources in a literature review, it affects the framework and scope of the research. The citation frequency was used as a bibliometric indicator to define a starting point and minimize the subjectivity of the selection and ranking of articles (groups 1 and 2). However human judgment is unavoidable because it determines what is relevant and what is not in the process. It should be mentioned that among the limitations in the use of bibliometric indicators based on citations, it is the fact that the type of predominant references can vary according to the area of knowledge and depends on the way citations are registered in the database [71,72]. These limitations must be taken into account when assessing the results presented in this study.

Some of these limitations are related to the bibliometric method that has been used. The use of citation frequency to select journals and articles does not allow us to understand the context in which the article or the journal was quoted since it can be a sporadic quote (that appears once or twice in the text) or a core citation to the theoretical development. Future researches can include all documents that have been retrieved and analyze their contents in order to understand how the quote was made and which of them are really crucial to the sustainable entrepreneurship research development.

In conclusion, the present literature review on sustainable entrepreneurship allows us to know the history and the current state of the field at international level by using Web of Science—Social Sciences Citation Index (WoS-SSCI) for data retrieval. There is also another limitation derived from the use of just WoS-SSCI. Despite the importance this database has in the scientific community, we suggested future bibliometric studies on the topic considering also other databases, such as Scopus, Google Scholar, Science Direct, EBSCO and Scielo. New revisions of the scientific production on sustainable entrepreneurship could be done through, for example, journal rankings and others specialized publications, such as academic books.

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## Appendix A

In addition to this definition, Table A1 presents other definitions of sustainable entrepreneurship found in works with a high influence in the field (at the time of this work, all the articles had received more than 200 citations).

**Table A1.** A literature review of the sustainable entrepreneurship definition.

Definitions and Key Aspects	Reference
“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”.	[9] (p. 35)
“The process of discovering, evaluating, and exploiting economic opportunities those are present in market failures which detract from sustainability, including those that are environmentally relevant”.	[22] (p. 58)
“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”.	[25] (p. 482)
“We view sustainable entrepreneurship as the discovery, creation, evaluation, and exploitation of opportunities to create future goods and services that is consistent with sustainable development goals”.	[26] (p. 58)
A focus “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”.	[73] (p. 142)
“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”.	[38] (p. 226)

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