

## Measuring The Ascending Trend For Sustainable Entrepreneurship: A Bibliometric Analysis

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**Abstract:** Entrepreneurship refers to initiating, organizing, and managing an innovative business to make a profit, while overcoming the financial threat. Sustainable entrepreneurship has attracted significant scholarly attention over the last decade, which states that there is an opportunity for generating new products, using new techniques that significantly reduce their social and environmental impacts. This study outlines the following research challenges and areas for future study, and provides bibliometric analyses for sustainable entrepreneurship. The data show that, notably, in the last two years, the quantity of publications and citations that get published has steadily increased. Bibliometric performance indicators identify the most productive and significant journals, countries, organizations, and individuals. This study tries to identify the essential publications in the field; the most frequently cited works, the top authors, and the top participating nations. The data were obtained from the Scopus database. Country and co-authorship network maps were designed using the VOS viewer program. This work advances our understanding of sustainable entrepreneurship and bibliometric methods, providing a more complete and trustworthy picture of this field.

**Keywords:** entrepreneurship, sustainable entrepreneurship, bibliometric analysis  
**JEL Classification:** L26, L31, M21, Q01, Q56, F63, I25.

## Introduction

A business enterprise, despite all its risks, must be created, organized, and managed to make it profitable:- this is called entrepreneurship. Creating new enterprises is a top goal for entrepreneurship (Abbasi et al., 2011; De Clercq et al., 2007; Ozkazanc-Pan, 2009). In economics, entrepreneurship that uses land, labor, natural resources, and capital can be profitable (Windapo, 2018). The entrepreneurial vision is characterized by experimentation and taking risks. It is a crucial element of a nation's capacity to prosper in a constantly evolving market, and it is becoming more competitive on a global scale (Nkongolo-Bakenda et al., 2006). Sustainability is the capacity to support or maintain a process consistently across time (Bota-Avram, 2022; Frangopol & Soliman, 2016; Windapo, 2018). Sustainability in business and policy strives to stop the loss of natural or physical resources so they can be used indefinitely (Djupdal & Westhead, 2015; Soto-Acosta et al., 2016). Sustainability includes economic, environmental, and social concepts (Anand et al., 2021).

Sustainable entrepreneurship is a cutting-edge research area incorporating the triple bottom line of economy, environment, and society. It is an economic activity that blends entrepreneurial activities with environmental and social sustainability (Frangopol & Soliman, 2016). Since entrepreneurship is the foundation of economies, researchers are constantly looking for ways to encourage it (Bota-Avram, 2022; Carl Folke, Thomas Hahn, Johan Rockstrom, 2009; Frangopol & Soliman, 2016; Mei et al., n.d.; Schaltegger & Wagner, 2011; Winn et al., 2011). Furthermore, sustainable entrepreneurship has been a research area of interest as people's understanding of the significance of social and environmental sustainability has grown (Schaltegger & Wagner, 2011; Terán-Yépez et al., 2020).

Entrepreneurship is considered, investigated, and is used to allow self-employment, which will result in financial rewards or as one of the means of establishing workplaces (B. Cohen & Winn, 2007; Emami & Khajeheian, 2018; Klewitz & Hansen, 2014; Raman et al., 2022; Satalkina, 2020). In simple words, entrepreneurship comes within the gamut of stimulating economic growth, showing the issues concerning society and the environmental things that are ignored (Greco & De Jong, 2017; Konys, 2019; Wu & Wu, 2008). The appearance of sustainable development, and the increasing emphasis on environmental issues by governments, non-governmental organizations (NGOs), scholars, and corporation's leads to some academics contention. Sustainable entrepreneurship must depend on more than just getting money (Dean & McMullen, 2007; Katsikis & Kyrgidou, 2007; Klewitz & Hansen, 2014; Raman et al., 2022; Tehseen & Ramayah, 2015). Furthermore, some academics believe entrepreneurship can push economic sectors toward long-term development (B. Cohen & Winn, 2007).

In the past ten years, it has been observed that social inequality and environmental destruction are problems that can only be solved with the help of business (Al Mamun

et al., 2016; Muñoz & Cohen, 2018). This drew the interest of academics that have connections with traditional enterprises, communities, and the environment, to develop a new form of entrepreneurial behaviour called sustainable entrepreneurship (Omar, 2021; Pierce et al., 2017; Taatila, 2010). As per the study, Shepherd and Patzelt (2011) stated that sustainable entrepreneurship aims to protect social, economic, and environmental structures. Furthermore, he said that to obtain more financial gains, one cannot damage society (Hanohov & Baldacchino, 2018; Shepherd et al., 2013; Shepherd & Patzelt, 2011). To ensure the welfare of future generations, sustainable entrepreneurship has been observed as an idea that reconstructs the development of economic, environmental, and social values (Bec et al., 2018; Escamilla-Fajardo et al., 2021).

As a result, some scholars started to focus more on the relationship between entrepreneurship and sustainable development, which gave rise to the idea of sustainable entrepreneurship, also known as sustainopreneurship (Terán-Yépez et al., 2020). The basis for sustainable entrepreneurship is the triple bottom line (TBL), which consists of three elements: the environment, which takes into account long-term protection and the reduction of adverse effects; social, which considers clients, stakeholders, partners, workers, and the center of the population; and the economy, which is dependent on economic performance (Belz & Binder, 2017; Bocken, 2015; Criado-Gomis et al., 2017; Frangopol et al., 2017).

To protect the environment and other resources, many businesses, along with the government, have made commitments (Doran & Larsen, 2016). However, few investors are interested in "green investments" or sustainable investments (Gulati & Weiler, 2021). Sustainable entrepreneurship is a viable solution rather than a significant contributor, to social inequality and environmental destruction (Al Mamun et al., 2016; Muñoz & Cohen, 2018). This simple truth caught the attention of scholars, who created a new form of economic venture called sustainable entrepreneurship. It can be sustained entrepreneurship by trying to connect with society, or it can be environmental, or even traditional entrepreneurship (Klewitz & Hansen, 2014; Konys, 2019; Schaltegger & Wagner, 2011; Terán-Yépez et al., 2020).

Theoretically, scholars have been paying more attention to sustainable entrepreneurship, which has resulted in the appearance of the unique topic in academic journals like the Journal of Business Venturing, Greener Management International Journal, Sustainability, and International Journal of Entrepreneurial Behaviour & Research (Afifi et al., 2016; da Silva Veiga et al., 2017).

The Journal of Organizational Change Management published the first article on sustainable entrepreneurship that is suitable for examining the evolution of this field of study. That article recognized the critical group of actors, such as country, association, and author to evaluate the past and offer potential directions for future research (Fran-

gopol et al., 2017). Over the past 10 years, academics, professionals, and organizations have given sustainable entrepreneurship a lot of attention. To the best of our knowledge, the previously released assessments have yet to comprehensively analyze the critical contributions or the primary research issues, or develop the research themes, which would have resulted in more clarity in this domain. This study performed a bibliometric analysis to close this knowledge gap.

By adopting this broad viewpoint and responding to various requests for more research into the subject areas, this paper seeks to systematize the scientific output on multiple domains. In this manner, it provides academics with a comprehensive assessment of the disjointed literature published up to this point and suggests potential directions for future research. In addition, policymakers and practitioners may discover a helpful starting point for encouraging the growth of entrepreneurial sustainability. In keeping with this, a bibliometric analysis with the following research questions has been performed:

1. Which subject area, publications, authors, countries, and articles have the most impact?
2. What is the recent rising research trend in sustainable entrepreneurship which might not yet have been explored in the various domains of study?
3. Which subjects regarding sustainable entrepreneurship have received the most research, and have been investigated most often?
4. How is information about sustainable entrepreneurship organized?

This study makes the following contributions: It provides a complete assessment of the literature on sustainable entrepreneurship research over the past 20+ years, together with the fundamental statistical indicators. We emphasize the most influential authors, papers, institutes, countries, and frequently cited publications. Additionally, by combining specific science mapping techniques, such as co-authorship analysis, and co-citation analysis and with the enhanced bibliometric method, a complete visual demonstration of the academic information relating to sustainable entrepreneurship can be obtained, such as the networks and clustering visualization.

## Research Methodology

The purpose of this research is to trace the domain of sustainable entrepreneurship. The study provides data about the most influential publications, institutions, citation titles, nations, and publishers. For this bibliometric analysis, its research results can be a strong foundation for locating meaningful contributions in this sector, and trying to detect recent developments and recommendations for future research. In this research, a sample of

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701 articles from Scopus between the years 2000 to 2022 was analysed. This research aims to provide an in-depth review of the existing published articles, by conducting a thorough bibliometric analysis of the research into sustainable entrepreneurship using a bibliometric software tool, such as VOSviewer.

**Database And Method**

We used the Scopus database to give a thorough map of sustainable entrepreneurship which is reliable due to the current advancements in bibliometric research. Investigating existing and new research trends in sustainable entrepreneurship is the primary goal of this review, which also identifies potential future research areas. The Scopus database was considered because it generates papers of the premium quality and is a trustworthy resource for indexing prestigious journals (Klewitz & Hansen, 2014; Terán-Yépez et al., 2020). Furthermore, the database was chosen because it has a significantly greater number of high-quality journals listed. As other researchers have noted, the accurateness of the search criteria for gathering information from the database has a significant impact on the trustworthiness of bibliometric research (Bota-Avram, 2022; Konys, 2019; Meerow & Newell, 2015; Most et al., 2018; Skute et al., 2017; Terán-Yépez et al., 2020).

The Scopus database was utilized to find publications about "Sustainable Entrepreneurship," "Sustainable Business Performance," "Sustainable Performance," and "Sustainable Business" that were published between 2000 and 2022. To guarantee the completeness of this search, these keywords were mentioned in the article, including titles, abstracts, and keywords. Only the articles that were present in the English language were considered, and the final sample articles were collected in comma-separated values (CSV) file formats for the bibliometric analysis software.

**Table 1.** Research Framework

|                           |   |
|---------------------------|---|
| Step No 1: Field of study | "Sustainable Entrepreneurship"  |
| Step No 2: Database       | "Scopus Database"   |
| Step No 3: Research work  | Article title, Abstract, Keywords   |
|                           | "Sustainable Entrepreneurship," "Sustainable Development," "Business Development" |
|                           | Result Filtration = 701   |
|                           | Between the Years 2000 to 2022  |

|                       |                                  |                                   |
|-----------------------|----------------------------------|-----------------------------------|
| Step No 4: Analysis   | <b>Bibliometric Analysis</b>     | <b>Visualization (VOS viewer)</b> |
|                       | Subject area                     | Co-authorship network mapping     |
|                       | Journal with maximum publication | Country-wise network mapping      |
|                       | Year wise publication            |                                   |
|                       | Most cited papers                |                                   |
|                       | Most prolific authors            |                                   |
|                       | Most prolific countries          |                                   |
| Step No 5: Conclusion | Analysis                         |                                   |

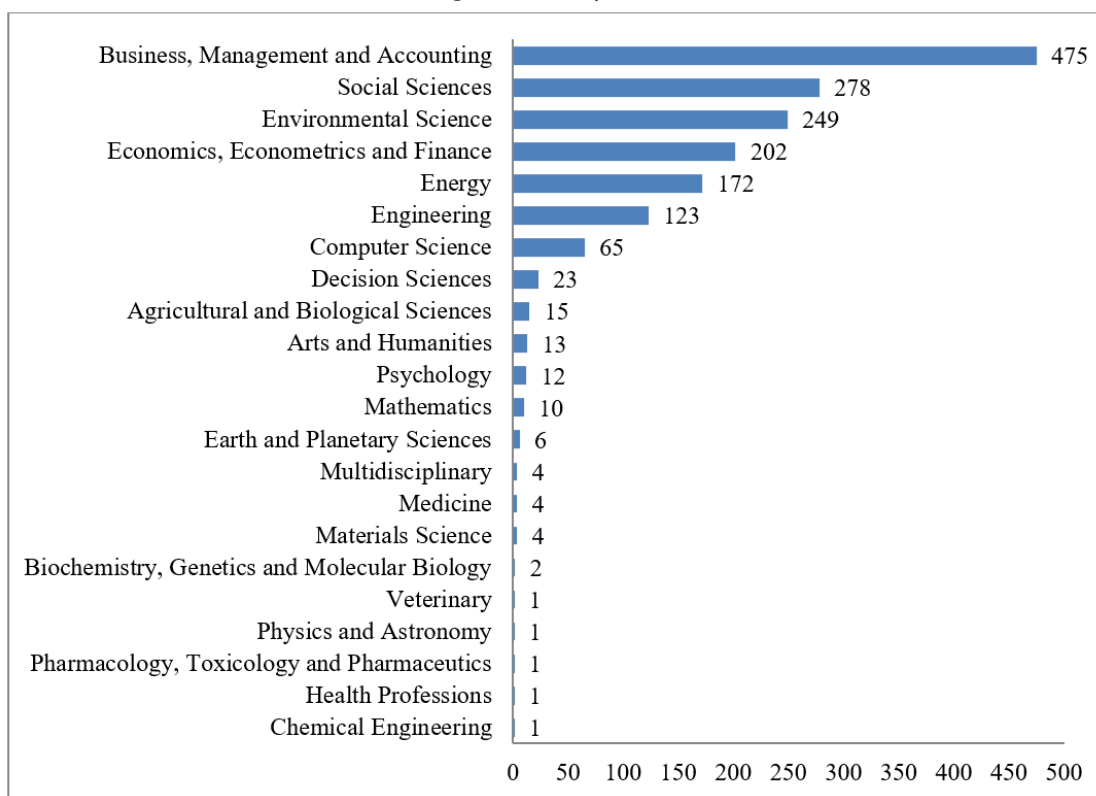
During the search, it was observed that there were 701 articles on sustainable entrepreneurship. Further, to confirm the title, abstract, and keywords, each title was read by the authors. The categorization of the articles was provided based on the year-wise publication, subject area, most creative authors, journals with maximum publications, and most creative countries and most cited studies.

## Results And Findings

### *Subject Area*

From the overall publication on sustainable entrepreneurship, the most articles 475 were written about the subject area of business, management, and accounting. One of the articles on this subject had the most citation 845; this was titled "Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions," which was published in the Journal of Business Strategy and the Environment. Subject areas such as social science and environment science had 278 and 249 studies, respectively. There were 202 studies on economics, econometrics, and finance, along with 172 studies into energy. Fewer studies have been done in the fields of engineering and computer science, with 123 and 65, respectively. Only one study per subject were published in veterinary, physics and astronomy, pharmacology, toxicology and pharmaceuticals, health professions, and chemical engineering.

**Figure 1.** Subject Area



(Source: Scopus Data Base)

### ***Journals With Maximum Publications***

The studies published on sustainable entrepreneurship belong to a variety of journals. The below-mentioned table shows the top 20 journals. These journals published the largest number of studies on sustainable entrepreneurship. Sustainability Switzerland published 91 articles. The Journal of Cleaner Production had 50 studies, and Business Strategy and the Environment published 30 studies. Furthermore, the journals such as the International Journal of Entrepreneurial Behaviour Research and Business Venturing have published 18 and 11 studies, respectively.

**Table 2.** Journals With Maximum Publications

| <b>Journal Name</b>   | <b>Number of studies</b> |
|---|--------------------------|
| Sustainability Switzerland                                      | 91                       |
| Journal Of Cleaner Production                                   | 50                       |
| Business Strategy And The Environment                           | 30                       |
| International Journal Of Entrepreneurial Behaviour And Research | 18                       |
| Journal Of Business Venturing                                   | 11                       |
| International Journal Of Entrepreneurial Venturing              | 9                        |

|  |   |
|--|---|
| Organization And Environment   | 8 |
| Small Business Economics   | 8 |
| Entrepreneurship And Sustainability Issues                               | 7 |
| International Journal Of Entrepreneurship And Small Business             | 7 |
| World Review Of Entrepreneurship Management And Sustainable Development  | 7 |
| Journal Of Business Ethics   | 6 |
| Administrative Sciences  | 5 |
| Emerald Emerging Markets Case Studies                                    | 5 |
| Environment Development And Sustainability                               | 5 |
| International Entrepreneurship And Management Journal                    | 5 |
| International Journal Of Management Education                            | 5 |
| Studies On Entrepreneurship Structural Change And Industrial Dynamics    | 5 |
| World Journal Of Entrepreneurship Management And Sustainable Development | 5 |
| British Food Journal   | 4 |

(Source: Scopus Data Base)

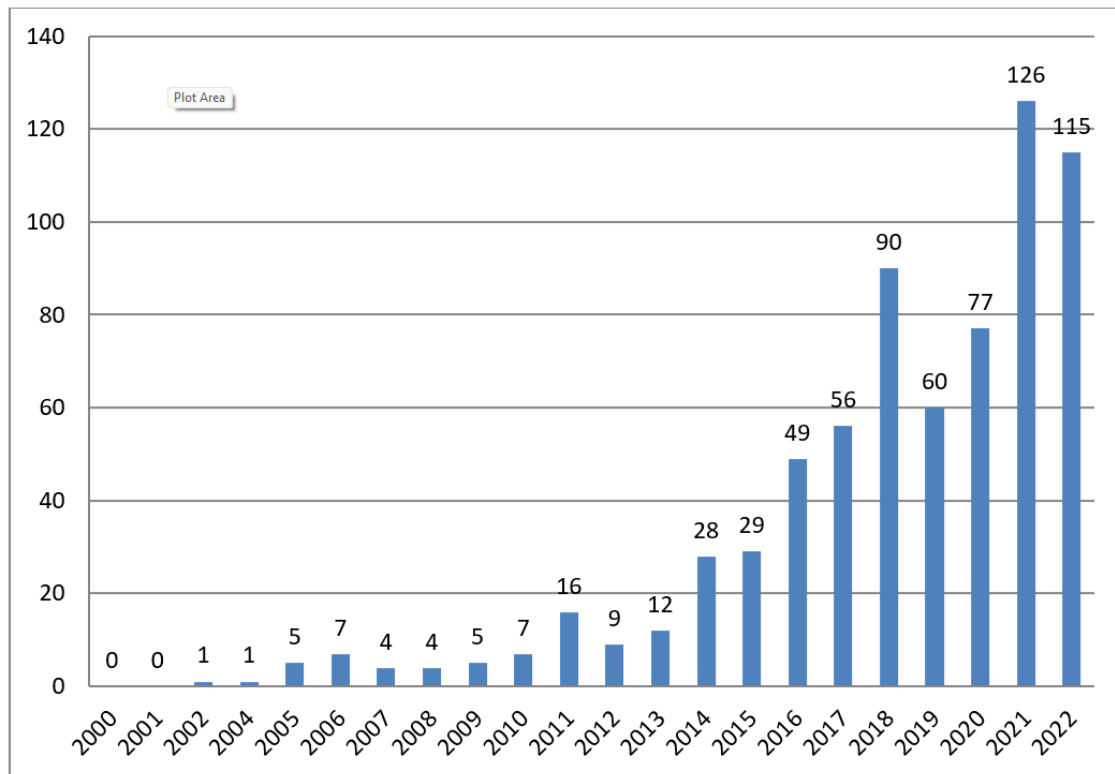
### **Year Wise Publication**

The number of studies published from 2000 to 2022 is shown in this table. There was evidence that the number of surveys on sustainable entrepreneurship has grown over time. From 2000 to 2013, the number of published studies was significantly reduced. The research series increased from 28 to 77 between 2014 and 2020, implying a significant increase in researchers' interests. Furthermore, the most prominent research has been published in the past five years. From 2019 to 2022, the number of studies increased from 60 to 115.

The maximum number of studies was published in 2021 (126 studies), which showed that the attention of research into the field has grown tremendously in recent times. In 2022, research done by Sadiq M. had the overall highest number of citations for that year; this was published in the China Finance Review International Journal. That same year, the second-highest number of citations was 25 for study by O'Neil, which was published in the Journal of Business Venturing.



**Figure 2.** Year-Wise Publications



(Source: Scopus Data Base)

### ***Most Cited Paper***

As per the data from Scopus, the 20 most cited studies are presented. It was noted that the most cited paper with 829 citations, was written by Schaltegger S. In his article, the author developed a new concept for sustainable entrepreneurship and its innovation (Schaltegger, Lüdeke-Freund, et al., 2016; Schaltegger & Wagner, 2011). The concept was built with sustainable entrepreneurship that could be widened by incorporating social entrepreneurship, which refers to using the entrepreneurial approach to accomplish social goals and changing market conditions related to sustainability's innovation. Furthermore, the concept could be used as a reference by managers who want to adopt sustainability's innovation and foster sustainable entrepreneurship (Johnson & Schaltegger, 2020; Schaltegger et al., 2018; Schaltegger, Hansen, et al., 2016; Schaltegger, Lüdeke-Freund, et al., 2016; Schaltegger & Wagner, 2011).

Another frequently cited paper was by Dean T.J., and; McMullen J.S. Their article showed how entrepreneurship could make it possible to address issues through the global socioeconomic system's relationship with the environment. While entrepreneurial literature maintains that market failure generates possibilities, environmental economics claims that market failure results in ecological degradation (Dean & McMullen, 2007; Mc-

mullen & Warnick, 2016; Winn et al., 2011).

The third most cited paper is by Cohen B. and, Winn M.I. According to their study, there were four market inadequacies: inefficient firms, asymmetric information, a faulty cost structure, and uncertainty. The study contributes to environmental degradation even while supplying enormous opportunities for the creation of cutting-edge innovations and business strategies (B. Cohen et al., 2008; P. R. Cohen & Levesque, 1990; Enoch, 2006; Frangopol et al., 2017; Mikami & Hinshaw, 2006; Winn et al., 2011).

**Table 3.** Most Cited Studies

| Sr No. | Authors  | Title   | Year | Cited by |
|--------|--|---|------|----------|
| 1      | Schaltegger, S., Wagner, M.                      | Sustainable entrepreneurship and sustainability innovation: Categories and interactions   | 2011 | 829      |
| 2      | Cohen, B., Winn, M.I.                            | Market imperfections, opportunity and sustainable entrepreneurship  | 2007 | 775      |
| 3      | Dean, T.J., McMullen, J.S.                       | Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action                              | 2007 | 775      |
| 4      | Hockerts, K., WÅstenhagen, R.                    | Greening Goliaths versus emerging Davids - Theorizing about the role of incumbents and new entrants in sustainable entrepreneurship             | 2010 | 649      |
| 5      | Klewitz, J., Hansen, E.G.                        | Sustainability-oriented innovation of SMEs: A systematic review   | 2014 | 640      |
| 6      | Shepherd, D.A., Patzelt, H.                      | The New Field of Sustainable Entrepreneurship: Studying Entrepreneurial Action Linking "What Is to Be Sustained" With "What Is to Be Developed" | 2011 | 518      |
| 7      | Schaltegger, S., Hansen, E.G., LÅdeke-Freund, F. | Business Models for Sustainability: Origins, Present Research, and Future Avenues   | 2016 | 467      |
| 8      | Kuckertz, A., Wagner, M.                         | The influence of sustainability orientation on entrepreneurial intentions - Investigating the role of business experience                       | 2010 | 378      |
| 9      | Schaltegger, S., LÅdeke-Freund, F., Hansen, E.G. | Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation                  | 2016 | 312      |
| 10     | Pacheco, D.F., Dean, T.J., Payne, D.S.           | Escaping the green prison: Entrepreneurship and the creation of opportunities for sustainable development                                       | 2010 | 290      |
| 11     | Young, W., Tilley, F.                            | Can businesses move beyond efficiency? The shift toward effectiveness and equity in the corporate sustainability debate                         | 2006 | 247      |
| 12     | Lans, T., Blok, V., Wesslink, R.                 | Learning apart and together: Towards an integrated competence framework for sustainable entrepreneurship in higher education                    | 2014 | 227      |
| 13     | Belz, F.M., Binder, J.K.                         | Sustainable Entrepreneurship: A Convergent Process Model  | 2017 | 222      |
| 14     | Gast, J., Gundolf, K., Cesinger, B.              | Doing business in a green way: A systematic review of the ecological sustainability entrepreneurship literature and future research directions  | 2017 | 211      |
| 15     | Shepherd, D.A., Patzelt, H., Baron, R.A.         | "I care about nature, but. disengaging values in assessing opportunities that cause harm  | 2013 | 178      |
| 16     | Lordkipanidze, M., Brezet, H., Backman, M.       | The entrepreneurship factor in sustainable tourism development  | 2005 | 169      |
| 17     | Cohen, B., Smith, B., Mitchell, R.               | Toward a sustainable conceptualization of dependent variables in entrepreneurship research  | 2008 | 162      |
| 18     | Gibbs, D.  | Sustainability entrepreneurs, ecopreneurs, and the development of a sustainable economy   | 2006 | 157      |
| 19     | MuÅoz, P., Cohen, B.                             | Sustainable Entrepreneurship Research: Taking Stock and looking ahead   | 2018 | 153      |
| 20     | Bocken, N.M.P.                                   | Sustainable venture capital - Catalyst for sustainable start-up success?  | 2015 | 144      |

(Source: Scopus Data Base)

The fourth most cited paper was by Klewitz J. This paper evaluated the diverse image that research has created over the last 20 years, with an emphasis on innovative activities, including various kinds of sustainability-oriented innovations and strategic sustainability behavior of SMEs, using an interdisciplinary, systematic review that was undertaken between 1987 and 2010. The author visited significant research databases and conducted a bibliographic and thematic analysis of 84 essential journal articles. The author claims that the initial strategic behaviour of SMEs toward sustainability ranges from resistance to anticipatory, reactive, and innovation-based activity to sustainability-rooted conduct.

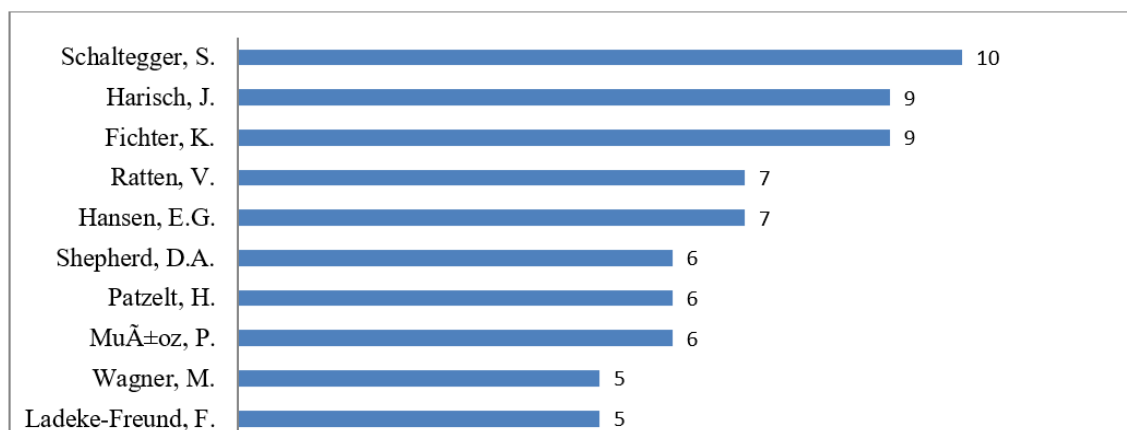
It also identified practices for organizational, process, and product innovation. Third, the results demonstrated that research was still primarily focused on eco-innovation as opposed to triple-bottom-line innovation (economic, social, and environmental dimensions), or SOIs of SMEs (Klewitz & Hansen, 2014; Schaltegger, Hansen, et al., 2016; Schaltegger, Lüdeke-Freund, et al., 2016).

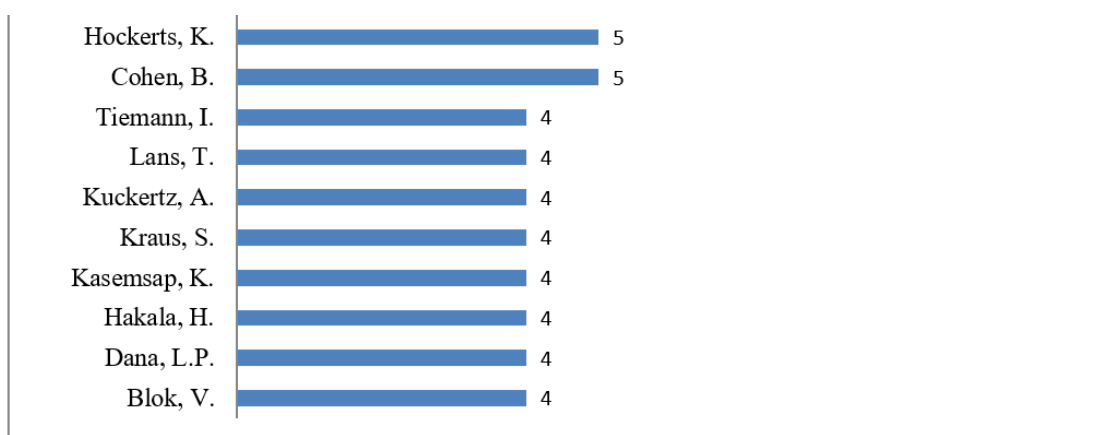
**Most Prolific Authors**

The study lists the 20 most creative authors. It has been observed that the most prolific author on sustainable entrepreneurship is Schaltegger, S, who has produced 10 research papers. The most cited paper by this author has 845 citations and was published in the Business Strategy and Environment Journal in 2011 (Schaltegger & Wagner, 2011). Another frequently cited paper has 488 citations and was published in the Organization and Environment Journal in 2016 (Frangopol & Soliman, 2016).

The third most cited paper by this author, which has been cited 324 times, was published in the Organization and Environment Journal in 2016. The next most prolific authors were Fichter,K, and Horsch. J with nine research papers each. Their most cited article was published in 2020 in the Journal of Cleaner Production (Breuer et al., 2018; Fichter & Tiemann, 2018).

**Figure 3. Most Prolific Authors**





(Source: Scopus Data Base)

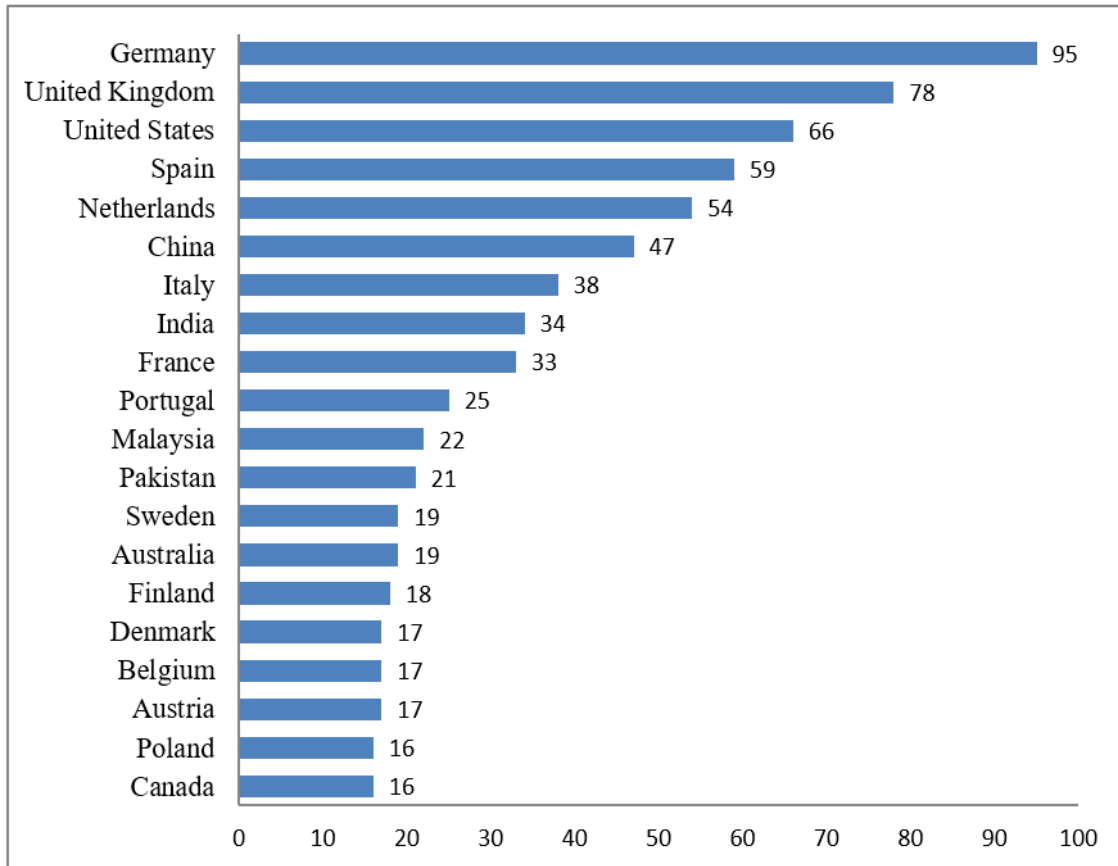
### ***Most Prolific Countries***

Germany (95), the United Kingdom (78), and the United States (66) were the top three countries with the highest number of articles publications about sustainable entrepreneurship. These countries have significantly contributed to the research output in the field, indicating their strong interest and engagement in sustainable entrepreneurship research. The data showed a substantial presence of European countries among the top contributors. Spain (59), the Netherlands (54), Italy (38), and France (33) were among the top countries, demonstrating Europe's commitment to sustainable entrepreneurship and its active involvement in research and publications related to the topic.

Asian countries, such as India (34), China (47), Malaysia (22), and Pakistan (21), have also made noteworthy contributions to the field. The study indicated the growing interest and involvement by Asian researchers in sustainable entrepreneurship research, reflecting the region's increasing focus on sustainability and entrepreneurship.

The data highlighted the dominance of European countries featuring among the top contributors. This further underscored the significance of sustainable entrepreneurship in European countries and the region's leadership in generating research into the topic. Several European countries, such as Austria, Belgium, Denmark, and Finland, have a similar number of publications (between 17 and 18); this suggests potential collaboration and knowledge exchange regarding sustainable entrepreneurship among these European nations.

**Figure 4.** Most Prolific Countries



(Source: Scopus Data Base)

### ***Affiliations Of The Authors***

The following table shows the affiliations of the authors. The maximum number of authors were affiliated with the Leuphana University of Lueneburg with 21 authors, which showed why authors from Germany, have done more studies into sustainable entrepreneurship. Furthermore, universities such as the Technical University of Munich and the University of Oldenburg have 12 and 11, respectively. Ten authors were from the University of Oldenburg and the University of Beira Interior. Most of the studies have been done in German, Portuguese, Finnish, and Spanish institutions. Most studies in Germany were carried out in institutions based outside Berlin.

**Table 4.** Affiliations of the authors

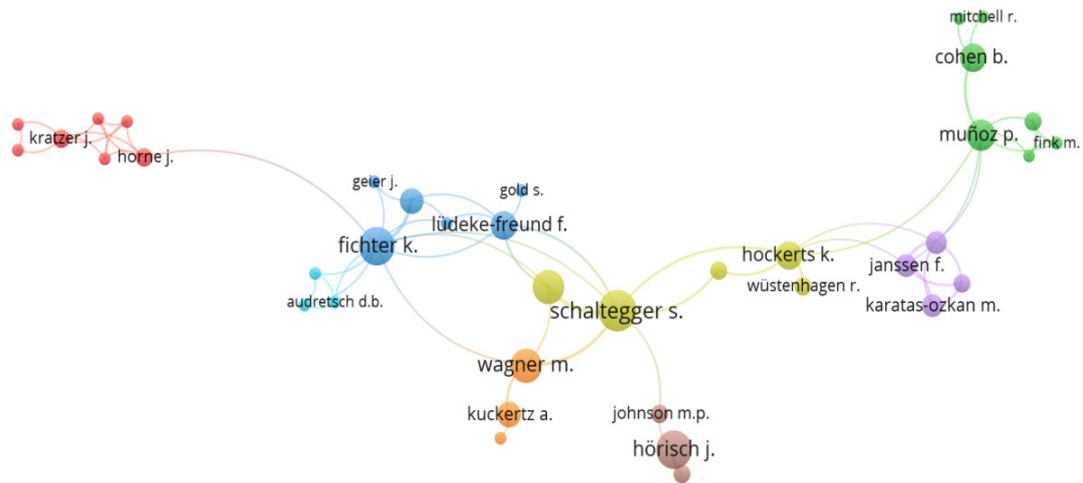
| Sr. No. | Affiliations   | Country Name | No of Articles |
|---------|--|--------------|----------------|
| 1       | Leuphana University of Lueneburg                       | Germany      | 21             |
| 2       | Technical University of Munich                         | Germany      | 12             |
| 3       | University of Oldenburg                                | Germany      | 11             |
| 4       | University Beira Interior                              | Portugal     | 10             |
| 5       | LUT University   | Finland      | 10             |
| 6       | Technische Universitat Berlin                          | Berlin       | 9              |
| 7       | University de Valencia                                 | Spain        | 8              |
| 8       | Wageningen University & Research                       | Netherlands  | 8              |
| 9       | Vrije University Amsterdam                             | Netherlands  | 8              |
| 10      | University Politacnica de Valancia                     | Spain        | 8              |
| 11      | University Utrecht                                     | Netherlands  | 7              |
| 12      | Universidad de Almera                                  | Spain        | 7              |
| 13      | Copenhagen Business School                             | Denmark      | 7              |
| 14      | Borderstep Institute for Innovation and Sustainability | Germany      | 6              |
| 15      | La Trobe University                                    | Australia    | 6              |
| 16      | Cz stochowa University Of Technology                   | Poland       | 6              |
| 17      | Julius-Maximilians-University Warzburg                 | Germany      | 6              |
| 18      | University of Hamburg                                  | Germany      | 6              |
| 19      | Grenoble Ecole de Management                           | France       | 6              |
| 20      | University of Liverpool Management School              | England      | 6              |

(Source: Scopus Data Base)

### ***Co-Authorship Network Mapping***

The co-authorship connectivity map created by the VOS viewer software is shown here. The image is composed of large and small circles linked by several lines. Authors who have already collaborated with other authors are shown by bigger circles and labels. Furthermore, the figure demonstrates the names of the authors who have collaborated the most with other authors in the data set. Eight clusters were formed in the database. Clusters 1 and 2 each have seven authors. In addition, the other clusters have five or six, or three authors.

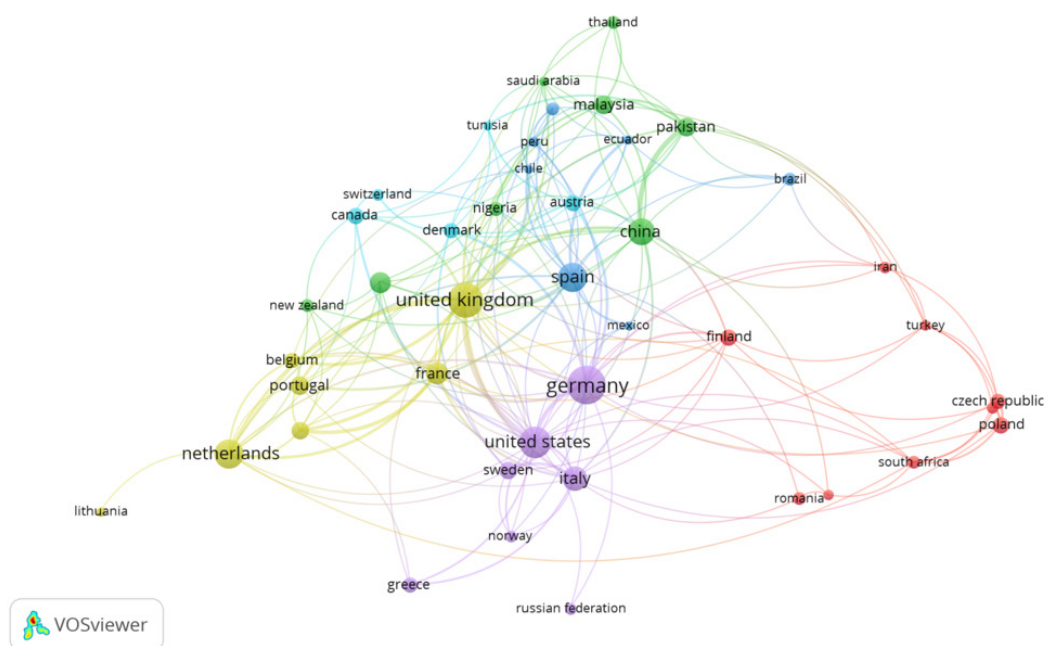
**Figure 5.** The obtaining fintech dataset process



(Source: VOS viewer)

### ***Country Wise Network Mapping***

The figure shows the country-wise detailed network map created with the VOS viewer software. The authors from different countries who have co-authored with other authors are assigned circles and labels. The figure shows the names of the country, which had the greatest number of authors in the data set. In the database, 11 clusters were formed. Clusters 1 and 2 consist of 10 countries each. Furthermore, the other clusters have nine or seven, or eight countries.

**Figure 6.** Country Wise Network Mapping

(Source: VOS viewer)

## Results And Findings

Sustainable entrepreneurship research encompasses numerous academic topics, including entrepreneurship, the environment, international business, and international management, and has been published in more than 100 journals. This article demonstrates that, even though researchers interested in sustainable management and entrepreneurship gave this field its start, sustainable entrepreneurship is currently a mainstream research area that attracts scholars from a wide range of academic fields (Klewitz & Hansen, 2014; Konyas, 2019; Terán-Yépez et al., 2020b). Contributions have been made by various nations' educational institutions, and interest in sustainable entrepreneurship is also visible in the geographic and interdisciplinary diversity.

The significance of this research helps to understand the value of sustainable entrepreneurship. The first research question aimed to identify the subject areas, publications, authors, countries, and articles that have had the most significant impact on sustainable entrepreneurship based on the data extracted from Scopus between 2000 and 2022. Through our bibliometric analysis, we identified the most influential subject areas: business, management, accounting, social sciences, environment science, economics, econometrics and finance, engineering, and computer science. These findings indicate the multidisciplinary nature of sustainable entrepreneurship and its intersection with the various domains. The



study had identified reputable journals and conference proceedings that are published in scopus database. The results enable researchers and practitioners to access critical sources for comprehensive and impactful studies.

Furthermore, we pinpointed prolific authors such as Schaltegger, Cohen, Dean, and Hockerts, who have contributed significantly to the literature on sustainable entrepreneurship. Recognizing these influential authors can aid in identifying potential collaborators and mentors, facilitating knowledge transfer, and promoting interdisciplinary research. Geographically, our study revealed the countries that have actively contributed to sustainable entrepreneurship research, such as Germany, the United Kingdom, the United States, Spain and the Netherlands. This information is valuable for policymakers and funding agencies seeking to support and foster research efforts in specific regions. Additionally, we determined the articles with the highest citation counts, indicating their widespread influence on the academic community. These highly cited articles serve as essential references for researchers and provide critical insights into the foundational concepts and ideas for sustainable entrepreneurship.

The second research question delved into identifying recent emerging trends in research into sustainable entrepreneurship that have not yet been explored extensively in previous studies. By analyzing the publication trends over time, we detected novel themes and areas of interest that gained momentum in the later years of our study period (from 2018 to 2022). These emerging trends include but are not limited to circular economy business models, green technology entrepreneurship, sustainable supply chain management, and the role of sustainable entrepreneurship in addressing social inequalities. These nascent research areas offer promising avenues for future investigation and policy intervention as they reflect contemporary concerns and challenges related to sustainable development and entrepreneurship. Scholars and practitioners can effectively leverage these insights to address pressing environmental and social issues.

The third research question sought to identify the subjects that have received the most research attention and investigation into sustainable entrepreneurship. Our bibliometric analysis identified vital themes such as business, management, accounting, social sciences, environment science, economics, econometrics and finance, engineering, and computer science journals that have been extensively studied and the results published. These subjects include sustainable business models, corporate social responsibility, eco-innovation, green marketing, and social entrepreneurship for sustainability. return on assets in the sample period, but the lag of FIN was a negative sign.

The final research question explored how information about sustainable entrepreneurship organized in the academic literature. Our bibliometric analysis revealed common patterns and structures in the literature, such as frequently cited references, networks of co-cited articles and authors, and clusters of related keywords. Understanding the organization of information on sustainable entrepreneurship can assist researchers in navigating the vast body of literature, identifying influential works, and tracking the flow of ideas and research collaborations over time.

This knowledge promotes a more efficient and comprehensive exploration of the existing literature and facilitates the integration of various perspectives in future studies. A thorough understanding of global research into sustainable entrepreneurship and its distribution across subject fields, publications, nations, institutions, and authors is also available to junior and senior researchers. It is significant because it clarifies how corporations and academic researchers continuously expand their knowledge. Finally, this study may be helpful to academics who are already researching this subject, because it makes several recommendations for new areas of investigation.

## **Conclusion**

In conclusion, a bibliometric study on sustainable entrepreneurship provides a comprehensive and up-to-date analysis of the scholarly output in this emerging field. By examining the data extracted from Scopus from 2000 to 2022, we have addressed four research questions that shed light on various aspects of sustainable entrepreneurship. Our study's multidimensional approach to exploring sustainable entrepreneurship research is significant. Unlike previous bibliometric studies, which often focused on either entrepreneurship or sustainability in isolation, we concentrated specifically on the intersection of both fields. This unique perspective allows us to uncover distinct trends, themes, and collaborations characteristic of sustainable entrepreneurship.

The study's objectives are to represent the state of the sustainable entrepreneurship discipline, identify important themes, and identify future research challenges using bibliometric analysis. This work has added to the knowledge about sustainable entrepreneurship and enhanced earlier literature studies. Diverse subject areas have access to sustainable entrepreneurship-specific literature.

However, Scopus was chosen over the other primary database because it contains nearly 84% of the articles in WoS and has more indexed journals than WoS (Klewitz & Hansen, 2014; Terán-Yépez et al., 2020). By choosing Scopus, the chance of missing documents during the search is decreased. Since the investigators determined study periods, the study periods used in the strategic diagrams may also influence the outcomes.

Choosing keywords that can directly influence the study's findings is one of its limitations, as with other bibliometric analyses. However, as we have demonstrated, sustainable entrepreneurship is recognized as a distinct concept that distinguishes it from related ideas. The idea of sustainable entrepreneurship has evolved in recent years to the point that several terms are associated. Choosing one database over another can also lead to limitations because the samples may vary.

This study observes the maximum number of studies related to sustainable entrepreneurship is in Business, Management, and Accounting, with 475 studies. An ultimate paper on sustainable entrepreneurship was published in 2021 with 134 publications. Most of the articles are posted by German authors, resulting in 88 documents in Scopus. The most prolific writers include Schaltegger, Lens, Parayannis, Muoz, and Cohen (Johnson & Schaltegger, 2020; Schaltegger, Hansen, et al., 2016; Schaltegger, Lüdeke-Freund, et al., 2016; Schaltegger & Wagner, 2011). Cohen, Schaltegger, and Wagner are the authors who have contributed the most to the growth of sustainable entrepreneurship research.

The three primary contributing nations are firstly Germany; secondly, the United Kingdom, and thirdly the United States, with a high range of clusters of a growing universal collaboration related to sustainable entrepreneurship research. The study concludes that sustainable entrepreneurship research is a growing trend because the number of publications and citations has increased exponentially over the past ten years. The rise of professional journals, the publication of special issues in very well journal articles, the existing demand for more research, and the increasing significance accorded by different factors such as companies and education institutions are just a few reasons for the enhanced interest in sustainable entrepreneurship.

The study will be beneficial to Managers and entrepreneurs. The comprehensive review of stakeholders, including the author, institution, and country, is constantly increasing to use the management lessons from this study. This review makes it simple to find references that will help them better understand sustainable entrepreneurship. Managers may also gain an idea of managerial interest. For example, they can learn how agents attempt to assist businesses by understanding various phenomena linked to sustainable entrepreneurship.

Managers might observe, for instance, that studies are being conducted to determine why workers' cognitive validity influences how attractive sustainable enterprises are to customers and how sustainable businesses might draw managerial talent. Furthermore, those who see that research is now being performed to understand better the founders of sustainable firms can use this research and how these practices ensure a sustainable entrepreneurial orientation in their businesses. These research findings sought to comprehend how numerous sectors of the economy enforce the transformation from a traditional

to a sustainable business model.

Future research agendas for new and experienced researchers in this field should include a more detailed analysis of the relationship between corporate social responsibility and environmental performance in sustainable development, green human resource management practices, and the advantages of ecological performance for businesses. Another critical area for future research is the industry and innovative technology. In addition, economic and social outcomes and other topics like developing nations and different chances or opportunities for young people are known. However, other subjects, such as sustainable management and business, human resources, etc., require additional research.

Furthermore, it would be beneficial to expand the database coverage and consider a broader range of literature sources in future studies to ensure a more comprehensive analysis. Additionally, exploring the perspectives of practitioners and policymakers through surveys or interviews could provide further insights into the practical implications of sustainable entrepreneurship research. Our bibliometric study is a valuable foundation for scholars and practitioners seeking to advance knowledge and foster sustainable entrepreneurship to address global challenges and promote a more sustainable future.

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