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Funding sustainable entrepreneurship: a hybrid systematic literature review and bibliometric analysis

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Abstract

Purpose – This literature review paper focuses on funding sustainable entrepreneurship. This paper aims to analyse the main trends in the intersection of these two fields, the current focus of the literature and synthesises the main findings.

Design/methodology/approach – The analysis consists of bibliometric literature research and relevant peer-reviewed literature content analysis based on a corpus of 74 papers. The analysis aims to understand how sustainable entrepreneurs can fund their ventures and the main funding sources that could be used. The study also presents the challenges and the strategies to fund sustainable ventures.

Findings – The findings show that the literature in the field is still nascent, even though scholars have shown a growing interest in it in the past five years. The focus of the literature is quite diverse between macro- and micro-level analysis and there are some rising topics such as alternative finance like crowdfunding.

Originality/value – Based on the content analysis, the paper synthesises the main trends of the literature and identifies some potential research gaps, such as post-funding empirical research and the efficiency of regulations supporting the emergence of sustainable entrepreneurship.

Keywords Bibliometric analysis, Finance, Funding, Sustainable entrepreneurship, Systematic literature review

Paper type Literature review

1. Introduction

Amidst the growing concerns about the planet's well-being, its environment and the need for inclusive economic growth, sustainability is emerging as necessary and strategic for businesses to guide them towards environmentally conscious practices, long-term value creation and responsibility in social issues. Today's world can be characterised by the echoes of climate change, social inequality and environmental degradation, reverberating the call for sustainability even more. It is a call that businesses can no longer ignore, not only for ethical reasons or regulatory obligations but also because it is increasingly seen as a strategic imperative for maintaining competitiveness and economic survival. As a result, sustainable entrepreneurship is receiving growing attention globally. It has been recognised that sustainability can bring many advantages to companies (Camilleri *et al.*, 2023). Sustainability in business lies not only in its

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potential to benefit our planet but also in its capacity to drive innovation and create economic value. Yet, navigating the complex terrain of sustainable entrepreneurship, especially when it comes to securing funding, remains a challenge. Several studies have shown that sustainability can create value and enhance financial performance. For example, [Lo and Sheu \(2007\)](#) demonstrated that companies with significant adoption of sustainable practices have been recognised as having a higher market value in the US stock market ([Lo and Sheu, 2007](#)). However, other studies have challenged this statement. A study led by [Qiu et al. \(2016\)](#) has shown no evident correlation between companies' environmental disclosures and profitability. It concluded that companies with more resources tend to engage more with environmental and social disclosures, leading them to positive benefits ([Qiu et al., 2016](#)).

The existing literature ([Yoon and Tello, 2009](#)) has defined sustainable entrepreneurship as those entrepreneurial activities that bring economic, ecological and social benefits, thus contributing to the triple-bottom-line concept. As social and environmental problems are complex, sustainable entrepreneurs will be able to address these complexities, demonstrate the effectiveness of their solutions and establish the legitimacy of their approach as a solution. Several problems can be resolved by entrepreneurs worldwide, including waste management, pollution and mitigating the effects of climate change, to name a few ([York and Venkataraman, 2010](#)). It is also important to note that sustainable innovation and entrepreneurship are also defined as the creation of services and products that address the needs of individuals and organisations while respecting natural resources and their capacity to return to life ([Tello and Yoon, 2008](#)). The early literature on sustainable entrepreneurship was focused on defining the field by distinguishing it from other forms of entrepreneurship, such as social entrepreneurship and high-growth entrepreneurship. The scholars then emphasised understanding sustainable entrepreneurship's unique components, notably the triple-bottom-line approach that balances economic, social and environmental goals ([Anand et al., 2021](#)). Other similar constructs have also emerged, such as green entrepreneurship or green start-ups ([Bendig et al., 2022](#)), which are defined as forming socially responsible enterprises with the mission of improving the environment based on sustainable development goals (SDGs) ([Bobkova et al., 2020](#)). Another similar construct is ecological entrepreneurship or ecopreneurs who engage in innovation processes that are socially inclusive towards local communities, addressing the community's specific needs and resources ([Juma et al., 2022](#)). Despite these relatively distinctive definitions, some scholars still use these terms interchangeably, which is why this study focuses on sustainable entrepreneurship as defined above, with the goal of reflecting upon this growing and emerging field of research.

In recent years, several review articles on sustainable entrepreneurship have been published, and one of the frequent criticisms of this concept has been that sustainable entrepreneurs are unable to secure funding as a result ([Bobkova et al., 2020](#); [Kahupi et al., 2021](#); [Li et al., 2020](#); [Mansouri and Momtaz, 2022](#); [Predkiewicz and Kalinowska-Beszczyńska, 2021](#)). For example, [Anand et al. \(2021\)](#) published a bibliometric review to research the main trends in the sustainable entrepreneurship field. Their conclusions organised the field into internal factors, analysing the main motivations of sustainable entrepreneurs and external factors to analyse the context ([Anand et al., 2021](#)). From this literature review, it emerged that sustainable entrepreneurs' main sources of motivation are a mix of opportunities recognition such as market gap identification, a desire for autonomy, and necessities like earning a living and adhering to green values. They are also motivated by complex factors, including the desire to enhance social and economic well-being, preserve community and cultural integrity and address environmental degradation. Externally, they are influenced by regulatory and policy environments, market and customer demands, resource availability and constraints and social and community factors, all of which shape

their sustainable practices and innovations (Anand *et al.*, 2021). Other related review articles looked at environmental entrepreneurship (Piwovar-Sulej *et al.*, 2021) and some have focused on a specific topic, such as crowdfunding and sustainability (Böckel *et al.*, 2021). Another related review, yet focused on social entrepreneurship and opportunities for external financing at three levels: individual, organisational and institutional, was published by Schätzlein *et al.* (2023). While existing research has explored the impact of sustainable practices on corporate performance, a critical gap lies in understanding the diverse funding sources and mechanisms available to sustainable entrepreneurs and how these mechanisms are navigated in different economic contexts. Furthermore, practitioners need to clearly understand the types of funding that exist and the strategies firms use to achieve sustainability. To date, the collection of previous empirical findings and best practices in securing funding for sustainable entrepreneurship has been rather limited and lacks a complex picture of the options, which is why the body of knowledge and business practice should be extended for the holistic overview of the possibilities to finance sustainable entrepreneurial efforts.

Therefore, this study brings novel insights by systematically reviewing the literature from the corpus of papers on the spectrum of funding sources for sustainable entrepreneurship, their characteristics and the unique challenges they present. The paper combines a bibliometric analysis and a systematic literature review to synthesise a wide range of literature. This review challenges existing assumptions and advances scholarly understanding of how sustainable entrepreneurship is financed. As part of a systematic literature review, this paper aims to examine the body of literature to answer the following question: *How can sustainable entrepreneurs fund their ventures?* This research question can be broken down into the following (sub) questions:

- Q1. What are the main trends and gaps in the literature on sustainable entrepreneurship funding?
- Q2. What are the different forms of funding that are available for sustainable ventures and what are their characteristics?
- Q3. What are the main challenges that sustainable entrepreneurs face in order to finance their sustainable ventures?
- Q4. What strategies and approaches do sustainable entrepreneurs use in order to overcome these challenges and secure funding to succeed?

This research has a particular significance for other stakeholders, including scholars in the fields of sustainable entrepreneurship and entrepreneurship funding; policymakers who can leverage insights to frame supportive policies; investors who may understand emerging trends and opportunities; and entrepreneurs who stand to gain from understanding the sources of funding and strategies to secure funding for their ventures. This research addresses the urgent need to develop sustainable business models and fund their growth to tackle global environmental challenges and social inequities. Understanding the funding mechanisms can empower businesses to contribute to SDGs more effectively.

2. Methodology

This paper follows the principles of the systematic literature review, which attempts to study a corpus of scholarly literature to synthesise its content, develop insights and critically reflect the current state of the literature in the field. This systematic literature review follows the guidelines developed by Tranfield *et al.* (2003), which are based on six main steps: the

identification of the research, the definition of inclusion and/or exclusion criteria, the selection of the publications, assessment of the publications quality and the extraction of the data and the analysis of the data (Tranfield *et al.*, 2003).

The authors of this paper applied a hybrid systematic literature review protocol and a bibliometric analysis, also following the recommendations from the methodological article of Kraus *et al.* (2022). Following that, this paper is a systematic literature review focusing on a hybrid domain in the crossing between sustainable entrepreneurship and entrepreneurship funding literature. To grasp the trends in the literature and also synthesise its insights, a bibliometric analysis is followed by content analysis. The scholars used a few bibliometric techniques, such as the keywords co-occurrence and the co-authorship analysis, to identify the main trends in the literature following some best practices described in a methodological paper by Donthu *et al.* (2021).

2.1 Identification of the relevant literature

The methodology used for the systematic literature review on the funding of sustainable entrepreneurship was comprehensive and thorough. The research team diligently searched for all the papers published between 2000 and 2023, ensuring that the most recent findings were included in the search. Web of Science (WoS) and SCOPUS databases were extensively explored to ensure comprehensive coverage of the research landscape. The research focused on a wide range of combinations to capture the diverse aspects of sustainable entrepreneurship funding. The selection process follows the best practices of conducting a systematic literature search, described by Kraus *et al.* (2022) and Donthu *et al.* (2021), illustrated in Figure 1, and it took place in May 2023. The keywords in the databases research used included sustainable entrepreneur*, fund*, finance, venture capital (VC), investing, investment, business angel and crowdfunding. This extensive search strategy ensured that no relevant papers were overlooked.

The initial search yielded a total of 179 papers found on the WoS, whereas SCOPUS provided 85 papers. Details are provided in Figure 2. However, to ensure the quality and relevance of the final selection, strict exclusion criteria were applied, as well as the inclusion of the keyword *Sustainable Entrepreneurship*. Non-articles and non-English papers were removed from the analysis, resulting in a refined pool of 152 papers from the WoS and 63 papers from SCOPUS.

Keywords

Sustainable entrepreneur*, Fund*, Finance, Venture capital, Investing, Investment, Business angel, Crowdfunding

Inclusion criteria

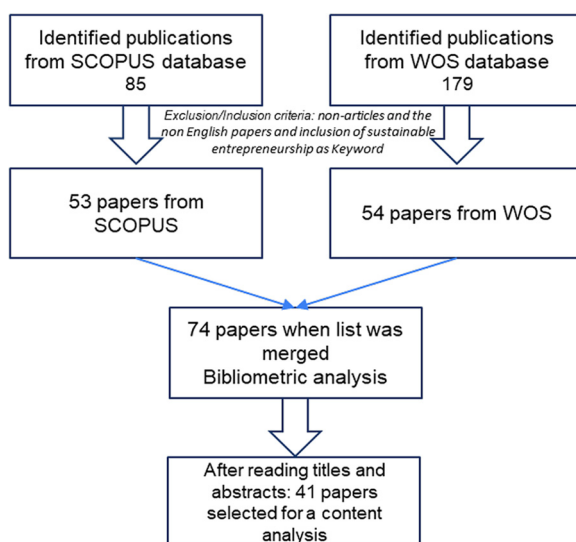
Time Frame	Publications from 2000 to 2023
Language	Only English-language articles
Type of Publication	Peer-reviewed journal articles
Relevance	Papers explicitly discussing sustainable entrepreneurship and funding
Database Coverage	Papers indexed in Web of Science and SCOPUS
Content Focus	Studies focusing on financial mechanisms, challenges, and strategies related to sustainable entrepreneurship

Exclusion criteria

Non-relevant Content	Papers not focused on sustainable entrepreneurship and funding or addressing unrelated topics
Non-Article Publications	Conference papers, book chapters, dissertations, and editorials
Duplicate Publications	Removal of duplicates identified across databases
Non-English Language	Exclusion of non-English articles
Quality Assessment	Papers failing to meet relevance and rigor based on initial screening of titles and abstracts

Sources: Authors' own work, inspired by Kraus *et al.* (2022) and Donthu *et al.* (2021)

Figure 1. Data selection methodology



Sources: Authors' own work, inspired by Kraus *et al.* (2022) and Donthu *et al.* (2021)

Figure 2. Overview of the sample selection process and methodology

To further narrow down the selection, the author team meticulously read the titles and abstracts of each paper. This careful evaluation process led to the identification of 54 relevant papers on the WoS and 53 relevant papers indexed in the SCOPUS database. The merging of these papers resulted in a final set of 74 papers that formed the basis of the bibliometric analysis. To merge the papers from the databases, the researchers exported the results from SCOPUS and WOS into a reference manager file (.RIS), used Zotero Software to merge the two publications lists and finally imported the file into VOSViewer for the bibliometric analysis.

2.2 Content analysis

The bibliometric analysis delved into the rich content of the selected papers. Every title and abstract were thoroughly examined, leading to the selection of 41 papers that were the most appropriate for the research topic and the research questions. These papers were then selected for detailed content analysis. This analysis involved the extraction of key concepts, themes and topics from each paper. The content analysis results provided valuable insights and patterns that shed light on the research topic of sustainable entrepreneurship funding. The content analysis in this systematic literature review involves a systematic and replicable methodology for absorbing a large volume of data from the literature into fewer content categories based on explicit coding rules. Initial codes were derived from the literature review and further refined through a pilot test involving a small subset of papers. This iterative process ensured the coding scheme captured all relevant aspects of sustainable entrepreneurship funding. The data was categorised into major themes such as funding sources (with codes such as VC, crowdfunding, corporate venture capital [CVC] or public grants), challenges (investor awareness, regulatory barriers or access to traditional finance)

and strategies (impact measurement, leveraging sustainable consumers, green signalling or collaborations) with specific codes under each category.

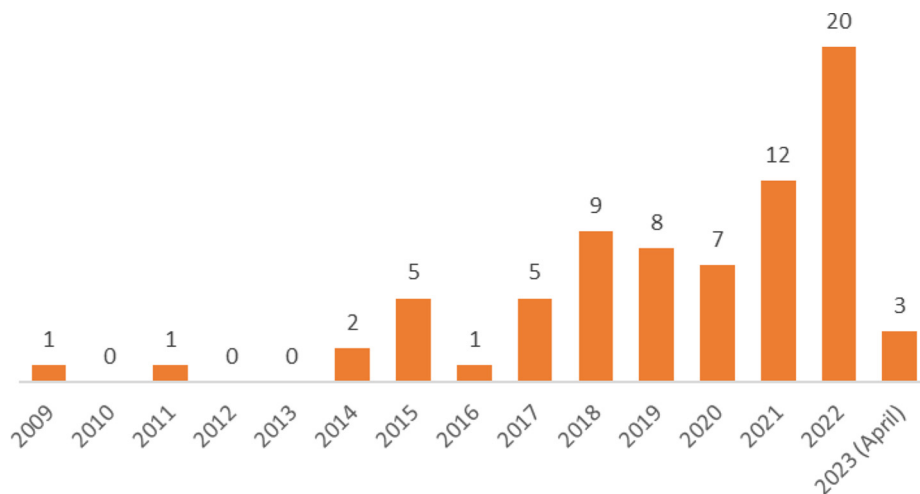
The methodology followed in this paper used a systematic way to select the relevant literature to analyse the state of the field. Through the strict database research and inclusion/exclusion criteria, this paper looked at the publications that can be used to look at the research question. The detailed content analysis ensured that the insights collected from the 41 papers represented the most relevant contributions to the cross-fields of sustainable entrepreneurship and entrepreneurship funding.

3. Findings

This part of the article introduces findings from the bibliometric analysis (Section 3.1) and the key findings from the selected studies (Section 3.2), which, integrated together, serve as a baseline for answering the stated research questions and formulating the study conclusions.

3.1 Bibliometric results

The bibliometric analysis was based on a sample of 74 publications. These publications were searched in the period from 2000 to April 2023, as already noted in the previous section. However, the first article about sustainable entrepreneurship and funding was published in 2009. The nascent nature of the sustainable entrepreneurship research field can explain this. The first phase focused on foundational papers capturing the construct of sustainable entrepreneurship from 2000 to 2007. This phase was followed by seminal research focusing on the sustainable entrepreneurship process (Anand *et al.*, 2021). The studies on funding sustainable entrepreneurship belong to the second phase, as the first article on this topic was published in 2009. After that, only a few articles were published, one in 2011 and two in 2014. This shows that the research on the intersection between sustainable entrepreneurship and funding is still in its early stages. The number of papers has gradually started to increase since 2015. As shown in Figure 3, the literature has gained momentum in recent years and



Source: Authors' own work

Figure 3. Number of publications per year from SCOPUS and Web of Science databases

2022 has shown a record of 20 papers published. This growth of the field has been noticed in a few literature reviews in the field (Piwowar-Sulej *et al.*, 2021; Böckel *et al.*, 2021). It shows an increased interest in the field and the emergence of new trends such as impact investing or crowdfunding. It can also be explained by relatively new and growing journals such as the *Journal of Cleaner Production* and *Sustainability*, which has published a cumulative 27 articles since 2018.

We can also easily trace the leading journals in this field from this nascent literature. Two journals are clearly dominant in this field, as shown in Table 1, which are journals with a strong orientation towards sustainability: *Journal of Cleaner Production* and *Sustainability*. The analysis also shows that the rest of the publications are spread across many journals (36 journals), publishing one or two articles. It is also worth noticing that the top-ranked management journals are scarcely present in this list. For example, the *Journal of Small Business Management* (two publications) or the *Journal of Business Venturing* (one publication).

While we can find some leading journals in this field, it is more difficult to identify leading authors. The scholars used a co-authorship analysis to analyse the links between authors in the literature to understand the most active authors in the field and if there are clusters and the formation of groups. Unfortunately, the analysis provided in Figure 4 was not conclusive. Only six authors published more than two articles and only two groups of co-authors were identified. Deborah De Lange and Jacob Hörisch are the main published authors, with three articles each. Ioannis Nikolaou and Kyriaki Tasopoulou and Clyde Eiríkur Hull and Millette Sherwyn were the two co-authorships. Both pairs have published two articles in this field. Discovering a limited number of authors who have co-authored only a few papers together can indicate that the corpus of papers represents an emerging area of research where the research community is still growing, and there is still a gap in the co-authorship networks that needs time to develop. With time, as more researchers enter the field, we can expect to see more collaborative links.

The SLR also looked at the main focus of the research in the field. Table 2 shows the overview of the focus of the papers and the percentage of the corpus of the volume of the studied literature. Table 2 informs readers that the main focus of the research was on ecosystem development, which represented 16 publications or 21.6% of the articles. The second most popular focus is crowdfunding as a source of funding for sustainable entrepreneurship. Overall, we can see that the majority of the research is dedicated to a macro analysis with a focus on ecosystems (16 articles), policy aspects (nine articles) and sectoral analysis (three articles). There is a clear trend in research that is looking at how

Table 1. Top journals by number of publications

Journal name	No. of publications
<i>Journal of Cleaner Production</i>	18
<i>Sustainability</i>	14
<i>Entrepreneurship and Sustainability Issues</i>	2
<i>International Entrepreneurship and Management Journal</i>	2
<i>Journal of Small Business Management</i>	2
<i>Small Business Economics</i>	2
<i>International Journal of Entrepreneurial Behavior & Research</i>	2
Others (one publication)	31

Source: Authors' own work



Source: Authors' own elaboration in VOSViewer software

Figure 4. Visual map of co-authorship in the literature

sustainable entrepreneurship can be a change agent in the economy and create a dynamic. Scholars are looking at evidence in various ways the ecosystems evolve in Europe (Flygansvær *et al.*, 2019; Malega *et al.*, 2021; Manesh and Rialp-Criado, 2017; Mlaskawa, 2022; Outsios and Farooqi, 2017; Silajdzic *et al.*, 2015) and Asia mainly (Ferdousi and Mahmud, 2019; Haldar, 2021; Rosmiza *et al.*, 2015; Saghaian *et al.*, 2022;

Table 2. Focus of the publications in number of articles and percentage share

The focus of the article	No. of publications	Relative proportion (%)
Ecosystem development	16	21.6
Crowdfunding	10	13.5
Policy	9	12.2
Venture capital	5	6.8
Success/challenges factors	5	6.8
Sustainable entrepreneurship model	5	6.8
Corporates	4	5.4
Gender	3	4.1
Impact measurement	3	4.1
Sectoral analysis	3	4.1
Microfinance	2	2.7
Others	9	12.2

Source: Authors' own elaboration in VOSViewer software

[Shukla et al., 2023](#)). The scholars are studying the economic development factors, the ecosystemic gaps, the entrepreneurial dynamic and the role incentives play. The variety of empirical research on the development of sustainable entrepreneurship ecosystems shows how the construct has gained interest and relevance internationally in the past few years. The funding types are also an important focus, with a dominance of crowdfunding (10 articles), VC (five articles), corporates (four articles) and microfinance (two articles). Another category of focus is micro-analysis, including the success and challenges factors for sustainable entrepreneurship funding (five articles) and the model of sustainable entrepreneurship (five articles). Finally, some articles focus on transversal areas like gender (three articles) and impact measurement (three articles).

The analysis also looked at the main areas of research based on keyword analysis. Using the VOSViewer software, the authors could identify the main sub-areas of the literature. A keyword co-occurrence analysis was done to understand the literature's main trends. In [Figure 5](#), a visual map was produced using VOSViewer that helps to define four groups and sub-areas. The first group (Creation, Knowledge, Performance, Orientation, Entrepreneurship, Sustainable entrepreneurship, Innovation, Green and Technology) can be called and interpreted as Sustainable Technological innovation. The key theme here is the involvement of technology and innovation to improve the performance of entrepreneurial efforts towards sustainability. The second group (VC, Investments, Impact, Entrepreneur, Business, Decision-Making) can be interpreted as VC and Investment Decision-Making. This group is centred around the investment aspect of entrepreneurship. It also highlights the importance of the impact generated from these investment decisions. The third group (Green Entrepreneurship, Green Economy, Barriers, Field, Finance) can be called the Challenges in Green Entrepreneurship. The keywords in this group suggest another sub-field of green entrepreneurship as a part of the sustainable entrepreneurship field. This group is focused on the challenges and barriers to the development of a green economy, with finance being a central piece in it. The fourth group (Energy, Ventures, Determinants, Crowdfunding, Crowd, Crowdsourcing, Sustainability, Sustainable Development and Investment) is between crowdfunding and sustainability. A strong emphasis on the crowd suggests an increasing interest in alternative financing for sustainable entrepreneurship.

business incubators or other similar support entities, known within the concept of entrepreneurial infrastructure (Dvouletý *et al.*, 2018; Dvouletý, 2023). The subsequent phase of funding introduces the engagement of business angels, who contribute financially and bring considerable business acumen. Corporations can also be instrumental in this seed stage, primarily through their corporate social responsibility (CSR) initiatives or competitive schemes designed to promote entrepreneurship. Commercial banks may offer financial support as the entity transitions into a revenue-generation phase. However, their propensity to engage is often limited due to the perceived risk associated with nascent business ventures. Venture capitalists may enter the financial equation upon validation of the enterprise's business model and its emergence as a fledgling start-up. In fact, the majority of the funding sources for sustainable entrepreneurship are venture capital, accounting for about 70%, according to Zhang *et al.* (2021). Despite the continued perception of risk, these investors provide capital and offer valuable expertise and connections within their networks (Bocken, 2015). Venture capitalists participate in the start-up's journey, assisting in their maturation process until a point of exit is reached. This exit is commonly achieved through an initial public offering, the involvement of private equity funds or the engagement of institutional investors (Bocken, 2015; Derdabi and Dvouletý, 2024).

As we can see, these funding sources can be perceived as similar to general entrepreneurship. However, sustainable entrepreneurs often rely on alternative funding sources such as crowdfunding, impact investing and grants. These sources are more aligned with the long-term and multidimensional goals of sustainable ventures, providing necessary capital without the immediate pressure for high financial returns. Engagements through CSR initiatives and green investment funds are crucial for sustainable entrepreneurship. Corporations interested in enhancing their sustainability profiles might invest in sustainable startups through their corporate venture arms, providing both capital and strategic support.

3.2.2 Rising interest in crowdfunding. Crowdfunding is increasingly seen as an innovative solution for the capital shortfalls often experienced by sustainable entrepreneurs (Horisch, 2015; Böckel *et al.*, 2021; Tenner and Horisch, 2021; Yacoub *et al.*, 2022). Its growth as a financial tool is significant, with a global volume of US\$90bn in 2020 (Böckel *et al.*, 2021). Crowdfunding of sustainable entrepreneurship is perceived as between financing and charitable giving, and it attracts non-professional investors not necessarily motivated by financial gains (Dinh and Wehner, 2022). However, existing literature provides a limited analysis of the intersection between crowdfunding and sustainability.

Entrepreneurs often face challenges securing traditional financing for sustainability projects due to their extended objectives beyond profit. The efficacy of crowdfunding for these projects is variable, with many campaigns failing to meet funding goals (Pabst *et al.*, 2021). To mitigate such issues, investors often use quality markers, such as third-party seals, as indicators of project worthiness.

The literature raises the importance of alignment between a project's quality seal and its inherent attributes. Discrepancies can deter potential investors. In addition to capital acquisition, crowdfunding also serves to legitimise corporate activities, enhance marketing efforts and test market viability. Studies have shown that public opinion and the brand effect can have a key role in influencing the demand for sustainable products and the success of crowdfunding campaigns (Chen *et al.*, 2018). Reward-based crowdfunding, as seen on platforms like Kickstarter, offers an alternative to traditional financing for sustainability entrepreneurs (Böckel *et al.*, 2021). The perceived value of a project's social or environmental mission can positively impact funding success (Bento *et al.*, 2019). However, sustainable entrepreneurs must balance philanthropic promises and commitments for long-term success.

3.2.3 Corporate venture capital. Among the funding sources, the studied literature shows a clear dominance of venture capital and the literature has highlighted it clearly. However, the

literature has also focused on a more specific type of VC, which is corporate venture capital. In fact, some of the challenges faced by sustainable entrepreneurs are not challenges for larger companies, especially regarding the time needed to return on the investment, as needed for a cleantech start-up. Indeed, to cross the “valley of death”, it takes a relatively long time to go from R&D to commercialisation (Michelfelder *et al.*, 2022). We can see that this long-term approach can prevent traditional VCs from investing in a cleantech start-up. Corporations can help to solve this problem as their motivations are not only for financial returns when investing in sustainable ventures (Hegeman and Sorheim, 2021).

CVC investments can also bring much value to start-ups and corporates. The literature shows that corporate investors interested in the sustainable sector have a differential legitimising effect on sustainable entrepreneurship (de Lange and Valliere, 2020; Bendig *et al.*, 2022). The literature reveals that green CVC investments significantly positively affect green innovation output, empirically evidenced by increased green patent applications (Bendig *et al.*, 2022). This finding illuminates the strategic benefits incumbent firms can derive from green start-ups’ investments in pursuing dual environmental and economic objectives. The companies can build knowledge and gain market insights by investing in green startups. The research led by Bendig *et al.* (2022) empirically shows that through CVC, incumbent firms – typically mature organisations with established market presence – can acquire the diverse knowledge base requisite for fostering radical green innovations (Bendig *et al.*, 2022). The research thus extends prior knowledge on the co-evolutionary dynamics of incumbents and startups in the sustainable transformation of markets, highlighting CVC as a pivotal instrument enabling incumbents to acclimate to high green technologies, thereby catalysing market transformation. Empirical research widens the purview of CVC literature by including all types of business organisations – including small and medium enterprises (SMEs) – that invest in cleantech startups. This approach contrasts with the conventional focus on large firms and CVC units, thereby addressing SMEs’ previously overlooked yet active role in sustainable entrepreneurship (Hegeman and Sorheim, 2021). An enumeration of motivations prompting companies to invest in cleantech startups has been identified. It found that large CVC investors are predominantly propelled by the strategic value inherent in the green opportunities offered by startups. Conversely, SMEs, though often less cognizant of the green profile, maintain investments in cleantech startups (Hegeman and Sorheim, 2021).

3.2.4 Challenges in securing funding for sustainable entrepreneurs. Scholars have extensively researched the challenges sustainable entrepreneurs face when acquiring funding for their ventures. Even though sustainable entrepreneurship holds an enormous potential to solve social and environmental issues, it is frequently hindered that entrepreneurs face significant funding challenges. The challenge for sustainable entrepreneurs can be even higher due to the multistakeholder nature of their business models (de Lange and Valliere, 2020). A primary challenge that sustainable entrepreneurs face is that they cannot access traditional financial institutions for credit (Tenner and Horisch, 2021). Lenders and banks are generally unwilling to provide financing for sustainable ventures, especially for smaller firms (Aristei and Gallo, 2021), because they perceive them as riskier or less profitable than conventional businesses. These lenders may overlook the short-term financial returns of sustainable entrepreneurship due to the potential long-term benefits and positive societal impact (Bendig *et al.*, 2022; Bocken, 2015; Zurkinden and Baldegger, 2023). The main challenges for sustainable entrepreneurs in raising funds include the dominance of “quick-win investment formats” (Bocken, 2015). Due to this, sustainable entrepreneurs struggle to obtain the capital they need to start or expand their businesses.

A significant obstacle to sustainable entrepreneurship funding is investors’ lack of awareness and understanding (Nikolaou *et al.*, 2018; Trautwein, 2021). A lack of knowledge

and understanding of sustainable business models and practices makes it difficult for sustainable entrepreneurs to attract funding and reach a critical mass of supporters (Pabst *et al.*, 2021). In some cases, investors are sceptical or reluctant to support sustainable entrepreneurship due to a lack of familiarity with the environmental and social aspects (Bocken, 2015; Mansouri and Momtaz, 2022). An empirical study on 80 investment decisions from traditional VCs has shown that sustainability is not yet integrated into their investment decisions (Wohler and Haase, 2022). In addition, measuring the impact of sustainable businesses presents a unique challenge that can impede the funding process. It can be challenging, especially for non-specialised investors, to evaluate sustainable ventures. Unlike traditional ventures primarily focusing on financial metrics, sustainable entrepreneurs must also demonstrate their social and environmental impact (Predkiewicz and Kalinowska-Beszczynska, 2021; Trautwein, 2021). The difficulty in measuring impact creates uncertainty for investors and makes it harder for sustainable entrepreneurs to attract funding based on the potential positive outcomes of their ventures (Mansouri and Momtaz, 2022).

Regulatory barriers further compound the funding challenges faced by sustainable entrepreneurs (Nikolaou *et al.*, 2018). Policies and regulations may inadvertently hinder the flow of capital by restricting funding options or creating additional hurdles for sustainable ventures (Böckel *et al.*, 2021). It has been shown that investors can be deterred by unstable governmental regulations related to sustainability investment, which have not necessarily been translated into financial returns (Hegeman and Sorheim, 2021). Addressing regulatory barriers and creating an enabling environment for sustainable entrepreneurship is crucial to fostering the flow of funds into this sector.

Moreover, sustainable entrepreneurship often requires substantial financial resources due to the high costs associated with developing sustainable technologies and implementing environmentally friendly practices (de Lange, 2017; Haldar, 2021; Kahupi *et al.*, 2021). Capital-intensive initiatives, such as cleantech projects, necessitate significant upfront investments. However, accessing such capital can be challenging for sustainable entrepreneurs, particularly those in the early stages of venture development. In the case of cleantech, the long development time required for R&D activities before commercialisation presents a high risk for investors and makes it hard for entrepreneurs to cross the “valley of death” before starting to generate revenue (Michelfelder *et al.*, 2022). Perceptions of lower profitability are also a significant hurdle in securing funding for sustainable entrepreneurs (Kahupi *et al.*, 2021; Tenner and Horisch, 2021). Some investors may believe that sustainable businesses are inherently less profitable than traditional ventures. They also perceive them as riskier. This misperception that sustainable products are more costly is highly debated. A study highlights that the main barrier to sustainability is not the cost but rather the human’s tendency to resist change until the problems become critical (Kahupi *et al.*, 2021). Overcoming this bias and demonstrating sustainable ventures’ financial viability and profitability is crucial to attracting funding from a broader range of investors.

From the literature review, we can, therefore, highlight some key differences between sustainable entrepreneurship funding and regular entrepreneurship. Sustainable entrepreneurship often faces higher perceived risks compared to regular entrepreneurship. This is primarily due to longer return on investment periods, unproven markets and nascent technologies that are commonly associated with sustainability-focused ventures. Investors may be wary of committing funds to these projects due to the uncertainty and potential for delayed profitability. One of the significant challenges in funding sustainable entrepreneurship is the difficulty in quantifying social and environmental impacts. Unlike financial metrics, which are straightforward to measure and communicate, the social and environmental benefits of sustainable ventures can be more subjective and harder to capture,

making it challenging to attract investors who require clear, measurable outcomes. Sustainable entrepreneurs must navigate a complex landscape of sustainability regulations and policies. These can include environmental standards, social responsibility guidelines and other regulatory requirements that add layers of complexity and potential costs, thereby posing additional hurdles to securing funding.

3.2.5 Strategies for acquiring funding for sustainable entrepreneurs. The literature shows some strategies that increase the chances for sustainable entrepreneurs to access funding. These strategies focus on building collaborations, impact measurement, seeking specialised sustainable investors and leveraging sustainable consumers. The construction of strategic alliances with other organisations facilitates access to collaborative funding opportunities and shared resources, empowering sustainable entrepreneurs to capitalise on mutual strengths and extensive networks (Haldar, 2021; Millette *et al.*, 2020). These affiliations with like-minded sustainable businesses and organisations generate opportunities for combined funding endeavours, resource amalgamation and enhanced visibility, thereby establishing a robust platform for sustainability ventures. By exploring and using these ecosystems, sustainable entrepreneurship can find which types of investors, including CVC, are best positioned to assist them to scale (de Lange and Valliere, 2020). Affiliations with like-minded organisations can accumulate social capital. A study by de Lange (2017) has shown how cleantech clusters can create an investment dynamic for its members. Similar empirical research has shown how clusters managed to create a dynamic to boost environmental innovation and investors' attention (Olteanu and Fichter, 2022). The power of collaborations and partnerships has also been recognised among investors (Sunny and Shu, 2019). Indeed, to mitigate the perceived lower returns and risk, investors can syndicate with other investment partners and join in the investment rounds of sustainable startups (de Lange, 2019). Sustainable entrepreneurs could benefit from seeking multiple funding sources through syndication and collaboration with multiple investors (Zhang *et al.*, 2021).

A niche segment of investors inclined towards green startups can be attracted by accentuating the environmental, social and governance (ESG) attributes of a venture and amplifying green signals to stakeholders (Bergset, 2018; Mansouri and Momtaz, 2022). However, this green signalling sent to investors needs to be clearly proven. Emphasising ESG criteria is a key strategy for sustainable entrepreneurs to attract specialised investors and differentiate them from regular entrepreneurs. By highlighting their commitment to sustainability, these ventures can appeal to investors who prioritise ESG factors. Sustainable entrepreneurs need to justify how they build a competitive advantage and trust in their model with the funders (Kahupi *et al.*, 2021). The research shows mainly two types of competitive advantage: resource and institutional-like tax incentives (Nikolaou *et al.*, 2018). The advantage can be built through technology or by managerial process and decrease operational and production costs (Nikolaou *et al.*, 2018). Furthermore, a tangible demonstration of the venture's value proposition through social and environmental impact reporting can lure investors who prioritise sustainability and measurable outcomes (Cai *et al.*, 2022). Simultaneously, sustainable entrepreneurs can exploit social media and diverse marketing channels to generate public interest (Pabst *et al.*, 2021), attract potential investors and effectively communicate their mission and efficiency practices (Aristei and Gallo, 2021). Leveraging community support through social media and crowdfunding platforms is another strategy used by sustainable entrepreneurs. This approach provides funding, builds a loyal customer base that is invested in the venture's mission and differentiates the business from regular entrepreneurs. This interest can be capitalised upon by harnessing crowdfunding platforms, which enable the procurement of funds from a vast pool of individual contributors with a vested interest in supporting sustainable projects.

Furthermore, sustainable entrepreneurs can access tailored funding and additional resources that align with the requirements of sustainable ventures by pursuing specialised funding programs, such as public grants (Belz and Binder, 2017; Schätzlein *et al.*, 2023) and entrepreneurial infrastructure supportive programmes, e.g. incubation and acceleration programmes (Deyanova *et al.*, 2022) or contests specifically designed to support creation of new sustainable ventures (Dvouletý, 2023). This funding strategy appeals to a segment of investors who prioritise social and environmental impact alongside financial returns, achieved by meticulously articulating their ventures' social and environmental benefits (Tenner and Horisch, 2021). Finally, alternative financing models such as ethical banking and sustainable VC can assist entrepreneurs in aligning their funding sources with their sustainable ethos and leverage government initiatives and programs that provide funding or incentives to environmentally friendly and socially responsible businesses.

4. Discussion

This paper shows the various types of funding sources available for sustainable entrepreneurs. The systematic literature review highlights a growing interest from scholars in this field, even though there is room for more research to support its development. The challenges and opportunities highlighted in this paper show the importance of building trust and competitive advantage to attract the attention of investors and financial institutions.

Our comprehensive literature review and bibliometric analysis answered the research questions. This investigation enabled us to pinpoint a diverse array of funding sources and mechanisms pivotal for sustainable entrepreneurship. A notable trend emerged in the literature, emphasising the significance of impact-driven VC funds alongside a burgeoning interest in corporate VCs. In addition, previous researchers have shown a keen interest in the rise of alternative financing methods like crowdfunding.

In this study, these financing instruments were described. However, it is noteworthy that our findings reveal a conspicuous lack of evidence concerning certain funding sources, such as angel investment and the relationship between climate and carbon finance and sustainable entrepreneurship. This research also comprehensively synthesised the challenges inherent in securing funding, particularly from traditional financial institutions. The literature offers a detailed summary and presents evidence from various contexts, elucidating the myriad factors that influence entrepreneurs' access to finance. Finally, the literature delineates various strategies sustainable entrepreneurs can employ to attract capital. A key finding relates to the signalling theory, highlighting that entrepreneurs need to effectively communicate their competitive advantage and sustainability impact. Such clarity is essential for sending a "green signal" to impact-focused investors, thereby enhancing their prospects for securing funding.

4.1 *New investment approach*

The sustainable entrepreneurship literature focuses on the necessity of building networks and involving investors in this investment approach, which is grounded in networks. The literature suggests that investing in ecosystems is necessary for sustainable entrepreneurship. The surrounding ecosystem and the network effects are highly relevant for the viability and success of entrepreneurship, especially for sustainable entrepreneurship (Haldar, 2021; Trautwein, 2021; Olteanu and Fichter, 2022; Wurth *et al.*, 2022). Indeed, the literature suggests that policymakers and investors should strongly focus on building and strengthening the environment that supports sustainable entrepreneurs. It highlights the importance of exploring sustainable entrepreneurs' attributes, challenges and opportunities to provide policy suggestions for promoting sustainability-oriented production and consumption (Haldar, 2021). The existing research suggests that some of the core issues need to be addressed, such as changing the

investors' motivations to invest in sustainable ventures, which can have tremendous long-term benefits to the ventures and to society (de Lange, 2017). Traditional investors such as banks, institutional investors and policymakers are crucial in mobilising funds and allocating them to long-term environmental projects (Aristei and Gallo, 2021).

In this sense, the literature also emphasises that sustainable entrepreneurship relates to collaborations and the engagement of stakeholders. Embedding the concept of stakeholder theory (Bergset and Fichter, 2015) is vital to understanding that investing in a sustainable venture alone is not enough, but building an enabling environment is vital for sustainable entrepreneurship to thrive. A specific funding instrument that has emerged as a critical element in the funding of sustainable entrepreneurship is crowdfunding. It is perceived as an alternative source of capital as it engages consumers heavily in supporting sustainable alternatives (Böckel *et al.*, 2021). However, there is a need for further research in crowdfunding, especially to examine the effectiveness of this funding instrument and the success rates of crowdfunding campaigns (Bento *et al.*, 2019; dos Santos Felipe *et al.*, 2022).

4.2 Sustainable transition

Sustainable entrepreneurship is regarded as a critical element in the United Nations' SDGs, focusing on the importance of focusing on environmental, social and economic sustainability. In that sense, sustainable entrepreneurship is perceived as a contributor to the green transition and policymakers should support its development. Indeed, by exploring new opportunities, the development and funding of innovative business practices can boost the greening of the economy (Bergset and Fichter, 2015; Nikolaou *et al.*, 2018; Pangarso *et al.*, 2022).

By understanding the motivations of entrepreneurs and investors, policymakers should develop targeted policies to attract the right investors and create a thriving environment for the development of sustainable ventures. For example, it has been shown that governmental incentives are a potential driver for sustainable entrepreneurship development (Nikolaou *et al.*, 2018). Policymakers must understand the different investors in sustainable startups and what motivates them to invest (Hegeman and Sorheim, 2021) when preparing a compelling mix of public policies. Governments have a key role in developing sustainable entrepreneurship by facilitating contracts with green entrepreneurs, enforcing environmental standards and enabling dedicated financial instruments (Demirel *et al.*, 2019). Implementing environmental taxes to channel "green investments" could also enhance sustainable entrepreneurship (Bobkova *et al.*, 2020). A study based in Estonia has shown that favouring taxation for green products and services was the main driver and perceived opportunity for the green transition (Kekkonen *et al.*, 2023). However, a crucial part of each implemented policy action must also be a proper evaluation of effects and cost-effectiveness (OECD, 2023).

Furthermore, there is a need for a consensus on the definitions in the field (Bergset, 2018). A lack of clarity and consensus can lead to confusion in the definitions of sustainable entrepreneurship, cleantech entrepreneurship, social entrepreneurship, green entrepreneurship, green sectors or green jobs. A consensus would help to hinder effective policy-making and research in the field. The establishment of a common understanding would strengthen the promotion of sustainable entrepreneurship.

4.3 Limitations

This systematic literature review and bibliometric analysis studied a corpus of papers on the fields of sustainable entrepreneurship and entrepreneurship funding. However, it faced some limitations that need to be communicated. The first limitation that needs to be acknowledged is the selection bias. Even though the scholars tried to broaden the research as much as possible, there was an exclusion of non-English papers or papers from less accessible

journals not indexed in the SCOPUS and WoS databases. Also, as the study selection process is based on inclusion and exclusion criteria, this can introduce subjectivity. As the field of sustainable entrepreneurship is relatively recent, scholars name it in various ways. In some papers, the construct is called green entrepreneurship; in others, it is called environmental entrepreneurship or ecopreneurship. However, after reviewing the literature, the authors observe a clear dynamic converging towards sustainable entrepreneurship, hence the choice to focus this paper on it. The third limitation is the choice of software. As the scholars used VOSViewer to conduct the bibliometric analysis and the database was a merger of SCOPUS and WOS, it did not allow the use of techniques such as the co-citations analysis. The fourth limitation is that as the field is still emerging, we could not identify clear leading authors or co-authorship networks that probably still have not formed yet.

4.4 Future research avenues

This systematic literature review has shown some essential gaps that would benefit from further research to grow the field onward. One of the main weaknesses of this field has been highlighted, which is that it lacks theory. There is a relatively low number of studies applying theory and the theories currently come mostly from neighbouring fields. This is another sign that the field is still in its early stages (Böckel *et al.*, 2021). However, for the growth of the field, the emergence of specific theories would be beneficial.

While the literature mentions various funding sources for sustainable entrepreneurship, some sources would benefit from more extensive research, such as angel investors, grants or the links between carbon markets and sustainable entrepreneurship. Future research could also address innovation in the finance sector, such as blockchain and its implication for sustainable entrepreneurship. Further research could also investigate the effectiveness of crowdfunding initiatives, verify their environmental impact and determine the success of the funded projects (Horisch, 2015). Furthermore, based on the systematic literature review conducted on crowdfunding led by Bökel (2021), as there are various forms of crowdfunding, the field is dominated by reward-based crowdfunding, whereas lending-based crowdfunding remains under-researched. This literature review also points out that even though crowdfunding shows some potential impact on sustainable development, this impact still needs to be empirically grounded (Böckel *et al.*, 2021). The field would also benefit from empirical research on the successful funding instruments in under-researched regions, especially outside of North America and Europe. The gap in research in the post-funding stages for sustainable entrepreneurship (Bergset, 2018; Mansouri and Momtaz, 2022) would benefit from a longitudinal empirical study to analyse the impact of funding.

Finally, the literature around policies would also be worth exploring. Various theories and empirical-based taxonomies exist to differentiate sustainable startups, but they do not provide a sufficient base for policy decisions (Olteanu and Fichter, 2022). In this manner, we bring attention to the case studies of successful sustainable entrepreneurs and their collections, as Derdabi and Dvoutely (2024) recommended. More research would be needed to understand the effectiveness of policies and the role of investors in different contexts and different economies. We have seen that there was a large diversity of evidence coming from various regions, mainly from European (Malega *et al.*, 2021; Manesh and Rialp-Criado, 2017; Mlaskawa, 2022; Outsios and Farooqi, 2017; Firmansyah *et al.*, 2024) and Asian economies (Bhatnagar *et al.*, 2022; Ferdousi and Mahmud, 2019; Haldar, 2021; Saghaian *et al.*, 2022). A comparative study of ecosystem dynamics showing how sustainable entrepreneurship evolves and its role in economic development would bring more perspective and understanding to what extent sustainable entrepreneurs can be agents of change and bring economic, environmental and social benefits in their context. Addressing

this gap would help practitioners and researchers develop evidence-informed strategies and programmes to promote sustainable entrepreneurship, the growth of sustainable ventures and achieving SDGs. We also need evidence on the systemic-level role of sustainable entrepreneurs to understand how they interact with other types of organisations and stakeholders through their triple effects: economic, social and environmental (Anand *et al.*, 2021). Understanding the systematic-level impact can show the amplifying effect the investment on sustainable entrepreneurship can have.

5. Conclusion

This review of the literature provides an important analysis of the current state of research in this area. The conducted systematic literature review has shown that even if the intersection of sustainable entrepreneurship and entrepreneurship funding is quite in its early phase, it has gained a growing interest from scholars in the past few years. The bibliometric analysis has demonstrated a variety of foci of the literature, going from macro analysis and ecosystem or policy analysis to the different financial instruments used in sustainable entrepreneurship. Also, much of the literature focused on the success and the challenge factors of funding sustainable entrepreneurship. This paper analysed the main sources of funding and highlighted the main sources, such as VC. The literature also showed a growing interest in crowdfunding and CVC. The research also analysed the main challenges and strategies that can be used to fund sustainable enterprises.

Finally, the study highlights some potential for future research. As the literature is still in the early phase, more empirical research could benefit from showing the effectiveness of some funding instruments, the post-funding impacts of sustainable enterprises and the effectiveness of policies. There is also a need for empirical research from emerging economies as most research focuses on North America and Europe. Finally, more research could also benefit from the emergence of new instruments, such as blockchain technologies or funding social entrepreneurship through the carbon markets.

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