

Approaching the role of innovation, education and multiplicity of context in sustainable and female entrepreneurship

Aproximación al rol de la innovación, la educación y la multiplicidad del contexto en el emprendimiento sostenible y femenino

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Abstract

Objective: This study provides detailed analyses of the theory of female entrepreneurship and the theory of sustainable entrepreneurship. These analyses focus on the concepts both separately and in conjunction. The study aims to uncover the linkages and the principal factors between the two terms such as innovation and education.

Methodology: First, a literature review is provided. Then, we conduct a descriptive and co-occurrence analysis of the intersection between female and sustainable entrepreneurship concepts.

Results: Our research sheds light on the link between women entrepreneurship and sustainable entrepreneurship and identifies the key constructs that influence this correlation. Innovation and education are outlined as crucial terms. Finally, the study confirms the relationship between female entrepreneurship and the Sustainable Development Goals (SDGs).

Limitations: While our study highlights crucial elements, it does not provide visibility to all possible relevant factors affecting female and sustainable entrepreneurship.

Practical implications: Implications for fostering development for female and sustainable entrepreneurship are presented. The study also shows the importance of measuring the impact of women entrepreneurs' sustainable spirit on SDGs 4, 5 and 8.

Keywords: female entrepreneurship; sustainable entrepreneurship; innovation; education; social entrepreneurship.

JEL Codes: L26; Q01.

Resumen

Objetivo: Este estudio busca proporcionar una revisión de la literatura sobre el emprendimiento femenino y emprendimiento sostenible. Nuestro análisis se centra en los conceptos por separado, y posteriormente en conjunto. El estudio tiene como principal objetivo descubrir los vínculos y los factores clave en la intersección entre ambos términos, tales como la innovación y la educación.

Metodología: En primer lugar, se realiza una revisión bibliográfica. A continuación, realizamos un análisis descriptivo y de co-ocurrencia sobre la intersección entre los conceptos de emprendimiento femenino y emprendimiento sostenible.

Resultados: Nuestra investigación arroja luz sobre el vínculo entre el emprendimiento femenino y el emprendimiento sostenible e identifica los constructos clave que influyen en esta correlación. La innovación y la educación se perfilan como términos cruciales. Por último, el estudio confirma la relación entre el emprendimiento femenino y los Objetivos de Desarrollo Sostenible (ODS).

Limitaciones: Aunque nuestro estudio destaca elementos cruciales, no proporciona visibilidad a todos los posibles factores relevantes que afectan al emprendimiento femenino y sostenible.

Implicaciones prácticas: se presentan las implicaciones para el fomento del desarrollo femenino y el emprendimiento sostenible. El estudio también muestra la importancia de medir el impacto del espíritu sostenible de las mujeres emprendedoras específicamente en los ODS 4, 5 y 8.

Palabras clave: emprendimiento femenino; emprendimiento sostenible; innovación; educación; emprendimiento social.

Códigos JEL: L26; Q01.

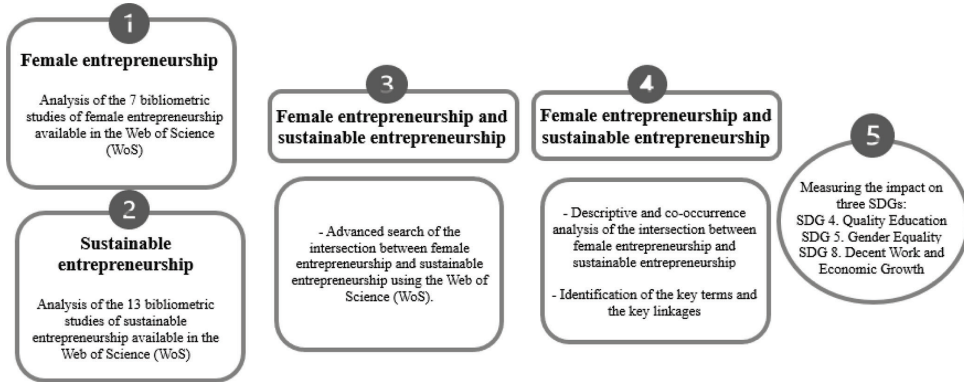
1. Introduction

Previous studies of female entrepreneurship have gradually unearthed a link between being a woman and showing an initiative to lead a sustainable venture. According to Vuorio et al. (2018), economic development and growth are fostered through sustainable entrepreneurship. Shepherd and Patzelt (2011) provided one of the first definitions of sustainable entrepreneurship, conceptualising it as the process of seizing opportunities and implementing ideas to create wealth for companies in a sustainable way, with a positive social and environmental impact. Soltyśik et al. (2019) and Tovmasyan (2022) have since validated this definition, highlighting the importance of further analysis of sustainable entrepreneurship practices. Aggarwal and Johal (2021) added that few researchers have considered sustainability and rural development in the study of female entrepreneurship. In this vein, there is a gap in the literature concerning the impact of gender on sustainable entrepreneurship development (Figuerola-Domecq et al., 2020; Barrachina et al., 2021; Xie & Wu, 2021; Yuniati et al., 2021; Gu & Wang, 2022). Thus, this area offers an excellent opportunity for progress because it has thus far been addressed from a general viewpoint without sharply focusing on deeply exploring the challenges and elements that affect women entrepreneurs (Santos et al., 2018; Nair, 2020; Barrachina et al., 2021) and their sustainable entrepreneurial spirit.

This information highlights the importance of qualitatively studying entrepreneurs who seek to have a sustainable impact. Also, in reference to sustainable entrepreneurship, Ogutu and Kihonge (2016) and Gu and Wang (2022) noted that, by combining it with technology and research, is crucial to foster economic growth.

To fill this gap, the present study offers separate detailed analyses of the theory of female entrepreneurship and the theory of sustainable entrepreneurship. It also examines the links between the two concepts. The structure of the study is shown in Figure 1. The first two steps (Steps 1 and 2) consist of separate reviews of the bibliometric studies within the literature on female entrepreneurship and sustainable entrepreneurship. Then, we set the focus on the intersection between female entrepreneurship and sustainable entrepreneurship is examined (Step 3). Next, descriptive and co-occurrence analysis of this intersection is presented (Step 4). At this stage, key terms and links between female entrepreneurship and sustainable entrepreneurship are defined. Finally, (Step 5) the main trends of this research field are proposed. These trends refer to confirming the practical correlation between women entrepreneurs, sustainable entrepreneurship, and SDGs 4, 5 and 8. They also refer to extending the analysis of the implications of sustainable entrepreneurship spirit for women entrepreneurs (Camargo et al., 2020; Nair, 2020; Barrachina et al., 2021).

Figure 1. Article structure



Source: Own elaboration.

2. Literature review

2.1. Exploring the origins and development of the female entrepreneur's literature

Research on female entrepreneurship must address new topics (Dewitt et al., 2022). In the first phase of the present study, the aim is to explore female entrepreneurship, its evolution and the fundamental terms that influence it. Therefore, a search of bibliometric analyses of female entrepreneurship indexed in the Web of Science (WoS) was conducted by searching for the combination of the keywords “women entrepreneur*”, “female entrepreneur*” AND “bibliometric” in the *Topic* search field. Table 1 shows the seven studies returned by the search. It is noted that there are no WoS-based bibliometric studies for the period 2018 to 2022. This means that even though the articles are published in the WoS (Web of Science), they have used different databases to gather the information.

We begin by highlighting the main search concepts associated with bibliometric analyses within female entrepreneurship field over the last years. Firstly, the study by Deng et al. (2020) provides a bibliometric analysis of research on female entrepreneurship and the family from the period 1975 to 2018. As part of their research, they included the term “mumpreneur”. This term demonstrates the inference of family on the female entrepreneur's development.

Secondly, Moreira et al. (2019) investigated female entrepreneurs' inclination towards internationalization. In contrast, female entrepreneurship was studied in the context of rural environments by Aggarwal and Johal (2021) and Madanaguli et al. (2021). Deng et al. (2020) introduced the concept of the small and medium-sized enterprise (SME) in their bibliometric study. Meanwhile, Madanaguli et al. (2021) examined female entrepreneurship in the context of SMEs in the tourism sector. Finally, Cardella et al. (2020) reinforced the importance of family support and its role in the female entrepreneurship process.

Table 1. Bibliometric analyses of female entrepreneurship

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
A look back over the past 40 years of female entrepreneurship: mapping knowledge networks	Gina Santos, Carla Susana Marques & Joao J. Ferreira	2018	Journal of Scientometrics	23	100	(<i>women entrepreneur*</i>) OR (<i>female entrepreneur*</i>) OR (<i>gender entrepreneur*</i>)	The article aims to provide a solid theoretical basis for a fuller understanding of female entrepreneurship.	Future research should continue to study female entrepreneurship with a focus on innovation and sectors other than those studied so far.
	Joana Moreira, Carla Susana Marques, Alexandra Braga & Vanessa Ratten	2019	Thunderbird International Business Review	26	120	" <i>Women entrepreneur*</i> " OR <i>female entrepreneur*</i> " OR " <i>gender entrepreneur*</i> " AND " <i>internationalist*</i> "	The article aims to review the literature on female entrepreneurship and its connection to the internationalisation process.	Future research should focus on the positive impact of women entrepreneurship on small and large enterprises.
Science mapping: a bibliometric analysis of female entrepreneurship studies	Wei Deng, Qiaozhuan Liang, Jie Li & Wei Wang	2020	Journal of Gender in Management	4	73	" <i>female entrepreneurship*</i> " or " <i>women*entrepreneurship*</i> " or " <i>female entrepreneur*</i> " or " <i>women entrepreneur*</i> " or FIRST (#1) " <i>female- led start-up*</i> " or " <i>women-led startup*</i> " or " <i>female-owned start-up*</i> " or " <i>women-owned star up*</i> " or " <i>female-led enterprise*</i> " or " <i>women-led enterprise*</i> " or " <i>female-owned enterprise*</i> " or " <i>women-owned enterprise*</i> " or " <i>female-led small business*</i> " or " <i>women-led small business*</i> " or " <i>female-owned small business*</i> " or " <i>women-owned small business*</i> " or " <i>female led emerging business*</i> " or " <i>women- led emerging business*</i> " or " <i>female-owned emerging business*</i> " or " <i>women-owned emerging business*</i> " or " <i>female-led new venture*</i> " or " <i>women-led new venture*</i> " or " <i>female-owned new venture*</i> " or " <i>women owned new venture*</i> " or " <i>female-led emerging venture*</i> " or " <i>women-led emerging venture*</i> " or " <i>female-owned emerging venture*</i> " or " <i>female-led SME*</i> " or " <i>female-owned SME*</i> " or " <i>women-led SME*</i> " or " <i>female-owned SME*</i> " or " <i>women- owned SME*</i> " or " <i>female-led high-growth*</i> " or " <i>women- led high-growth*</i> " or " <i>female-owned high- growth*</i> " or " <i>women owned high- growth*</i> " or " <i>female business owner*</i> "	The article aims to conduct an in-depth review of the literature within the field of female entrepreneurship over the period 1975 to 2018.	Future research lines should reinforce the importance of using databases other than WoS and adopting new research perspectives in this field.

(continued)

Table 1. Bibliometric analyses of female entrepreneurship (continued)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Women Entrepreneurship: A Systematic Review to Outline the Boundaries of Scientific Literature	Giuseppina Maria Cardella, Brizeida Raquel Hernandez-Sanchez & Jose Carlos Sanchez-Garcia	2020	Journal of Frontiers in Psychology	16	128	" <i>entrepreneur</i> " AND " <i>women</i> ,"	The article aims to investigate the scientific literature on the relationship between entrepreneurship and women.	Future research lines are as follows: (a) The impact of context and cultural environment on women's business management; (b) Providing value to women's business strategies; (c) The best way to adopt an inclusive perspective and understand female entrepreneurship.
Entrepreneurship and Family Role: A Systematic Review of a Growing Research	Giuseppina Maria Cardella, Brizeida Raquel Hernandez-Sanchez & Jose Carlos Sanchez-Garcia	2020	Journal of Frontiers in Psychology	10	167	" <i>family</i> " role, " <i>family</i> " support, " <i>parent</i> " role, " <i>parent</i> " support, " and " <i>entrepreneur</i> "	The article aims to provide a systematic review of the literature in this field, focusing on the impact of the family on the entrepreneurial process.	Future lines of research should reinforce further analysis into the connection between family support and entrepreneurial development, in different fields and from other approaches.
Rural women entrepreneurship: a systematic literature review and beyond	Aggarwal, Monika, & Ramanujit Kaur Johal	2021	Journal of Science, Technology and Sustainable Development	3	42	" <i>Women Entrepreneurship</i> " OR " <i>Female Entrepreneurs</i> " OR " <i>Women Entrepreneurs</i> " OR " <i>Female Entrepreneurship</i> " AND <i>rural</i>	The article aims to analyse female entrepreneurship in rural areas through a systematic literature review and bibliometric analysis.	Future lines of research should evaluate the importance of focusing on other areas, such as business education, microfinance and information technologies.
Entrepreneurship in rural hospitality and tourism. A systematic literature review of past achievements and future promises	Arun Thirumalesh Madanaguli, Puneet Kaur, Stefano Bresciani & Amandeep Dhir	2021	Journal of Contemporary Hospitality Management	6	178	" <i>farm tourism</i> ," " <i>agro-tourism</i> ," " <i>farm diversification</i> ," " <i>Albergo Diffuso</i> ," " <i>smallcommunity</i> ," " <i>small tourism</i> ," " <i>small hospitality</i> ," " <i>self-employ</i> ," " <i>entrepreneur</i> ," " <i>new venture</i> ," " <i>smallfirm</i> " and " <i>SME</i> ."	The article aims to analyse the evolution of entrepreneurship in the hospitality and tourism sector from a gender perspective.	As a future line of research, it is vital to compare different countries and use reliable scales.

Here, YP = year of publication, TC = total citations and TR = total references.

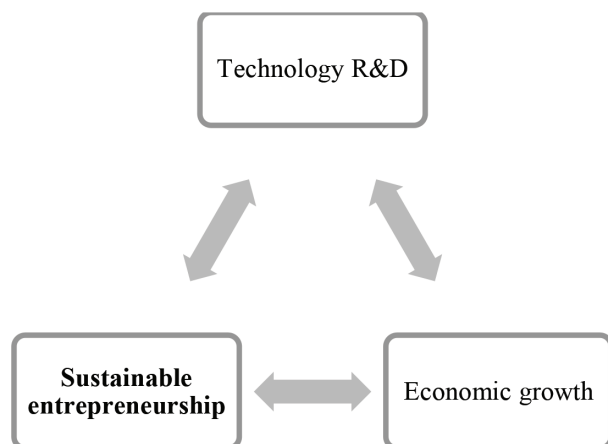
Source: Web of Science Core Collection (2017–2022).

To further understand female entrepreneurship, scholars should analyse the key factors that influence it considering the differences between areas. For example, Yuniati et al. (2021) analysed women's entrepreneurial motivation. In this vein, the creation of sustainable projects was found to be one of the most relevant elements of this motivation. Women view this objective as a positive change not only in business but also in society.

2.2. Analysing the origins and development of the literature on sustainable entrepreneurship

The concept of sustainable entrepreneurship is defined by its impact in three areas: the environment, society and the economy (Belz & Binder, 2017). Some potential and existing entrepreneurs opt for sustainable development (Ousios & Farooqi, 2017). However, others set focus on social entrepreneurship that aims to generate a positive social impact (Mas-Tur, 2022). The difference is therefore that sustainable entrepreneurship has a much broader scope than social entrepreneurship. To understand the disparity between entrepreneurs who are oriented towards sustainable entrepreneurship from those who are not, Gu and Wang (2022) highlighted the relevance of the sustainable entrepreneurship spirit outlined in Figure 2, concluding that the political context influences the creation of entrepreneurial projects with a positive societal impact. Beyond the sustainable motivation of entrepreneurs, the social responsibility of entrepreneurs and their positive impact on society is discovered in the literature (Peake & Eddleston, 2021).

Figure 2. Diagram of the effect of sustainable entrepreneurship



Source: Gu and Wang (2022).

Innovation, skills and creativity play a significant inference in bringing new perspectives on existing models (Karlsson et al., 2021). Furthermore, a recent concept known as open innovation underlines that to generate new knowledge, a relational and collaborative environment is needed (Modaffari et al., 2023).

In 2015, the United Nations (UN) Member States approved 17 Sustainable Development Goals (SDGs) and 169 targets to promote global sustainable development. Universities, companies, and organisations all play a fundamental role in achieving the SDGs. University research and business education are particularly important to achieve the SDGs (Ortiz-de-Urbina-Criado et al., 2022). The goals apply to all perspectives of humanity and the planet.

To explore the origin, evolution and trends of sustainable entrepreneurship, a search of all bibliometric articles indexed in the Web of Science (WoS) was carried out. The keywords “sustainab* entrepreneur*” AND “bibliometric” were used in the *Topic* search field. The search returned 20 articles after filtering for Articles & Review Articles. These articles are summarised in Table 2.

Table 2 shows that the earliest article is from 2018. Hence, research in this field is recent. In addition, the search keywords used in the bibliometric analyses presented in Table 2 reveal key themes in this field. First, there is an association with crucial terms such as ecology and environment. Sustainable entrepreneurship is linked to the terms “ecopreneur”, “enviropreneur”, and “ecological”. Such entrepreneurs are those whose main aim is to have a positive impact on the environment (Sarango-Lalangui et al., 2018; Bezerra et al., 2021; Piwowar-Sulej et al., 2021; Guleria & Kaur, 2021). The term “green” is also important, as well as the triple aim of social, environmental and economic impact (Sarango-Lalangui et al., 2018; González-Serrano et al., 2020; Bezerra et al., 2021; Guleria & Kaur, 2021). Second, these studies highlight the links with political institutions. The strong connection between political institutions and sustainable entrepreneurship affects the growth of sustainable initiatives (Tiberius et al., 2020; Oliveira et al., 2022).

Other relevant concepts include innovation and digitalisation. Moya-Clemente et al. (2021) cited innovation and sustainable innovation as crucial factors. González-Serrano et al. (2020) also developed the concept of innovation applied to entrepreneurship and sustainability. Along these lines, Camargo et al. (2020) introduced the term *digital entrepreneurship*, which focuses on the link between technological development and sustainable entrepreneurship. Zheng et al. (2022) indicated that new technologies and digitalisation help achieve the SDGs by enabling the emergence of techniques such as remotely sensing the state of the Earth’s surface and identifying the factors that negatively affect it.

Finally, another crucial factor is gender inequality. According to Islam and Sharma (2022), to reduce gender inequalities is critical for achieving the SDGs. Islam and Sharma (2022) analysed the patriarchal structure in Bangladesh, where gender inequalities mean that there are differences in the development, initiatives, livelihoods and subsistence of men and women. Moreover, Cardella et al. (2020) found that

Table 2. Bibliometric analyses of sustainable entrepreneurship

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
The Development of Sustainable Entrepreneurship Research Field	Paul Sarango-Lalangui, Jane Lucia Santos & Esther Hormiga	2018	Sustainability	39	73	“sustainable entrepreneurship” (or “sustainability entrepreneurship”), “sustainable entrepreneurial opportunity/ies, “sustainable opportunity (or “sustainable opportunities”), among others, such us, “ecological sustainability entrepreneurship”-“green”, “sustainable”, “ecological”, “environmental”, “entrepreneur*”, (including entrepreneur, entrepreneurial, entrepreneurship), “ecopreneur*” (ecopreneur, ecopreneurial,ecopreneurship), “enviopreneur*” “social/environmental/economic entrepreneurship”, (enviopreneur, enviopreneurial, enviopreneurship)- “conventional entrepreneurship”, “economic goals; social goals; ecological goals”)	The main purpose of the study is to generate a knowledge framework in relation to sustainable entrepreneurship.	Future research should focus on studying sustainable entrepreneurial spirit and exploring how it can be used to target innovation.
Sustainable entrepreneurship: an approach from bibliometric analysis	Ismael Moya-Clemente, Gabriela Ribes- Giner & Joana Carolina Chaves-Vargas	2021	Journal of Business Economics and Management	7	59	(“sustainable entrepreneurship” or Topic: (“sustainability entrepreneurship”) or Topic: (“sustainable venturing”) or Topic: (“sustainable start-up”) or Topic: (“sustainable innovation”) or Topic: (“sustainab* entrepreneur*”)	The main objective is to show the relationship or linkage between the most relevant authors, journals and countries.	Proposed future lines of research include comparing sustainable entrepreneurship in different countries from a practical perspective.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship *(continued)*

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Towards Sustainable Entrepreneurship Holistic Construct	Agnieszka Konyś	2019	Sustainability	2	100	“sustainable entrepreneurship” OR “sustainability entrepreneurship”	The primary purpose of this study is to highlight the connection between sustainable needs and entrepreneurial spirit.	Future research lines should include studying how to improve knowledge transfer from researchers to entrepreneurs and promote research, innovation and competitive advantage in sustainable enterprises.
Sustainable entrepreneurship: mapping of international scientific production between 2009 and 2019	Paloma Bezerra, Sandra Araujo de Souza & Geuda Gonçalves	2021	Journal of Management and Secretarial Studies (GESEC)	0	73	Entrepreneurship. Green Entrepreneurship, Sustainable Entrepreneurship, Ecopreneurship, Environmental entrepreneurship, Social entrepreneurship, Triple Bottom Line, TBL, Social dimension, Economic dimension, Environmental dimension, Sustainability, Sustainable development, Corporate social responsibility, Corporate social-responsibility, Sustainable society.	This study aims to analyse international scientific production in sustainable entrepreneurship from 2009 to 2019.	Research should continue to investigate sustainable entrepreneurship using different methodologies and databases.
Approaches to Entrepreneurship: Bibliometric Study of Scientific Production at Scopus Base	Maria Emilia Camargo, Marina Bezerra da Silva, Angela Isabel dos Santos Dullius, Mariane Camargo Priesnitz, Uliam Hahn Bieglmeyer & Marra Elisete Ventura da Motta	2020	Journal of Innovation and Technology Management (GEINTEC)	0	38	“Sustainable Entrepreneurship” “Social Entrepreneurship” “Cultural Entrepreneurship” “Female Entrepreneurship” “Digital Entrepreneurship”	This study seeks to analyse the concept of entrepreneurship from different approaches from a quantitative perspective.	In future research, it is important to analyse government policies on entrepreneurship.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship (continued)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Sustainable Sport Entrepreneurship and Innovation: A Bibliometric Analysis of This Emerging Field of Research	Maria Huertas Gonzalez-Serrano, Vicente Ano Sanz & Romulo Jacobo Gonzalez-Garcia	2020	Sustainability	12	108	(sustain* OR green) AND (entrepreneur* OR innovat*) AND sport*)	The study aims to establish a focus on a new field of research based on sustainable entrepreneurship and innovation in sports.	Further research is required in the field of sustainable sport entrepreneurship and innovation, and other data sources should be considered.
Sustainable entrepreneurship: Review of its evolution and new trends	Eduardo Teran-Yepez, Gema Maria Marin-Carrillo, Maria del Pilar Casado-Belmonte & Maria de las Mercedes Capobianco-Uriarte	2020	Journal of Cleaner Production	56	91	("sustainab* entrepreneur*" OR sustainopreneurship)	The purpose of the research is to give visibility to bibliometric analysis of the research area of sustainable entrepreneurship.	This study provides a clear analytical framework for future research and highlights the importance of including perspectives from different disciplines, generating synergies and promoting social impact.
Trends and patterns in sustainable entrepreneurship research: A bibliometric review and research agenda	Amitabh Anand, Padmaja Argade, Ralf Barkemeyer & Fanny Salignac	2021	Journal of Business Venturing	13	75	"Sustainable entrepreneur*"	The research aims to combine different bibliometric perspectives to establish strengths and areas for improvement in sustainable entrepreneurship.	A recommended future research line is the study of new associations between social entrepreneurship and entrepreneurial spirit.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship (continued)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Science Mapping of the Knowledge Base on Sustainable Entrepreneurship, 1996-2019	Trin Thananusak	2019	Sustainability	15	32	("sustainable") AND ("entrepreneurship") and the second keyword: ("sustainability") AND ("entrepreneurship")	This study aims to provide a more detailed background on sustainable entrepreneurship to be used as a guide by researchers in the future.	Future studies should adopt a quantitative approach and give visibility to key factors such as how context affects sustainable business development.
Environmental entrepreneurship-Bibliometric and content analysis of the subject literature based on H-Core	Katarzyna Piwowar-Sulej, Malgorzata Krzywonos & Izabela Kwil	2021	Journal of Cleaner Production	8	146	("environmental entrepreneurship" OR "ecopreneurship" OR "sustainable entrepreneurship")	The purpose of the study is to conduct bibliometric analysis to improve knowledge of environmental entrepreneurship using the H-Classics method.	A proposed future research line is to analyse the elements that influence entrepreneurial actions, as well as to consider the dynamism of sustainable and environmental entrepreneurship and adapt studies accordingly.
Social Entrepreneurship Research: Intellectual Structures and Future Perspectives	Maria Giuseppina Cardella, Brizeida Raquel Hernandez-Sanchez, Alcides Almeida Monteiro & Jose Carlos Sanchez-Garcia	2021	Sustainability	2	115	"Social Entrepren *"	The study aims to analyse and delve into social entrepreneurship through bibliometric analysis.	New research techniques should be applied, and a quantitative approach should be adopted.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship (continued)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Past Themes and Tracking Research Trends in Entrepreneurship: A CoWord, Cites and Usage Count Analysis	Luis Javier Cabeza Ramirez, Sandra M. Sanchez- Canizares & Fernando J. Fuentes- Garcia	2019	Sustainability	7	117	“entrepr.”	The purpose of the study is to improve knowledge of entrepreneurship and its evolution.	The use of other databases such as Google Scholar and Scopus is recommended.
Performance Analysis and Science Mapping of Institutional Entrepreneurship Research	Victor Tiberius, Meike Rietz & Ricarda B. Bouncken	2020	Journal of Administrative Sciences	8	121	“institutional entrepreneurship”	The purpose of the study is to provide visibility of the mapping of Institutional Entrepreneurship Research.	In future research, other databases and techniques should be used to enrich this field of study.
Entrepreneurship for the public good: a review, critique, and path forward for social and environmental entrepreneurship research	Siddharth Vedula, Claudia Doblinger, Desiree Pacheco, Jeffrey G. York, Shopie Bacq, Michael V. Russo & Thomas J. Dean	2022	Academy of Management Annals	2	282	n/d	This study aims to review social and environmental entrepreneurship literature to analyse how it affects the public good.	Future research should continue to explore how entrepreneurial spirit affects the public good.
Bibliometric an alysis of ecopreneurship using VOSviewer and RStudio Bibliometrix, 1989-2019	Deepa Guleria & Gurvinder Kaur	2021	Library Hi Tech	2	36	“Ecopreneurship” OR “Environment Entrepreneurship” OR “Green Entrepreneurship” OR “Sustainable Entrepreneurship.”	The main objective is to highlight the relationship between different articles on ecopreneurship/ green entrepreneurship/ sustainable entrepreneurship.	Further research should aim to provide guidance and support in this new field of entrepreneurship.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship (continued)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Academic Collaboration in Entrepreneurship Research from 2009 to 2018: A Multilevel Collaboration Network Analysis	Rui Song, Hao Xu & Li Cai	2019	Sustainability	6	40	Entrepreneur, new venture, emerging venture, founder, spin-off, start-up, and venture capital	The study's main objective is to analyse trends over the last 10 years in the area of entrepreneurship.	Further research should investigate what the positive effects on business decisions are and how to improve them.
Agri-food entrepreneurship. Harvesting, growing and reseeded the orchard through a bibliometric study	Damiano Petrolo, Mohammad Fakhar Manesh, Massimiliano Matteo Pellegrini & Giulia Flamini	2022	Journal of British Food	0	92	"Entrepr*" AND ("agri*" OR "agro*" OR "farm*" OR "food*")	The study aims to examine the literature on entrepreneurship in the agri-food sector over time.	This study highlights the need for further research to strengthen the understanding of country context and its impact.
Building sustainable entrepreneurial ecosystems: A holistic approach	Christina Theodoraki, Leo- Paul Dana & Andrea Caputo	2022	Journal of Business Research	0	115	"entrepreneur* ecosystem**"	This study aims to provide analytical insight and valuable information on entrepreneurship ecosystems.	Future research is proposed to use other studies from a less theoretical perspective.

(continued)

Table 2. Bibliometric analyses of sustainable entrepreneurship (*continued*)

Title	Authors	YP	Journal	TC	TR	Keywords	Purpose	Future research lines
Institutions and Firms Performance: A Bibliometric Analysis and Future Research Avenues	Alexandre Oliveira, Fernando Carvalho & Nuno Rosa Reis	2022	Journal of Publications	0	85	“Institutional-issues” “performance” “Business* Performance*”, “Enterprise* Performance*”, “Firm* Performance*”, “Corporat* Performance*”, “Financial Performance*”, “Profitab*”, “Econom* Performance*”, “Organization* Performance*”, and “Return On*”, “Desregulat*”, “Institution* Context*”, “Institution* Develop*”, “Institution* Environment*”, “Institution* Reform*”, “Institution* Theor*”, “Institution* Transi*”, “Institution* Void*”, “Legal* Institution*”, “Political Institution*”, “Institution* Qualit*”, “Institution*-based view”	This article aims to identify the limitations of research on entrepreneurship, the role of institutions and policies.	Possible paths for future research include sustainability and the impact of policy linkages.
Beyond the “ivory tower”. Comparing academic and nonacademic knowledge on social entrepreneurship	Paola De Bernardi, Alberto Bertello, Canio Forlano & Ludovico Bullini Orlandi	2021	Journal of International Entrepreneurship and Management	1	152	“social entrepreneur*”	The research aims to analyse the concept of social entrepreneurship through bibliometric analysis using Scopus.	Proposed future lines of research include improving studies of social entrepreneurship by adopting new perspectives.

Here, YP = year of publication, TC = total citations and TR = total references.

Source: Web of Science Core Collection (2018–2022).

female entrepreneurship fosters social inclusion and reduces discrimination, especially in developing countries. At this point, we highlight the relevance of consider the different idiosyncrasies of the research areas.

The Global Entrepreneurship Monitor (GEM, 2022) has also confirmed the importance of analysing gender inequalities, and the following SDGs, linked to the area of female entrepreneurship, are cited as necessary: SDG 4: Quality Education, SDG 5: Gender Equality and SDG 8: Decent Work and Economic Growth.

2.3. Are women entrepreneurs developing ties to sustainable entrepreneurial spirit?

The GEM 2021 report (Global Entrepreneurship Monitor, 2021) confirms that women are at the helm of organisations and companies that are committed to sustainability and think about more than just financial profitability in the short-to-medium term. These findings reinforce the importance of continuing to analyse the concepts of female entrepreneurship and sustainable entrepreneurship to understand the intersection between the two more fully. Ribes-Giner et al. (2019) highlighted the necessity of understanding female entrepreneurship in OECD countries from a gender perspective. They reported that countries with a high percentage of female entrepreneurs encourage a balance between people's professional and family life. The same is true of countries that offer a higher level of education. Therefore, research that investigates the causes of these trends and the influencing factors is crucial to understand and promote female entrepreneurship and thus sustainable political, social and economic development.

Recent studies shed light on the link between gender (i.e., being a woman) and the initiative to start sustainable ventures. First, according to Brush et al. (2009), encouraging research on entrepreneurship will provide policymakers with data and tools to support women entrepreneurs by better understanding their needs. The study highlights the importance of emphasising social and environmental impact projects and the differences between men and women. Secondly, Outsios and Farooqi (2017) showed that women have a stronger orientation towards sustainable entrepreneurship than men. In addition, women are better at managing their resources and networks to make their sustainable entrepreneurship initiatives a reality. Ruiz-Palomino et al. (2019) established a link between being a woman and the initiative of creating a social and sustainable entrepreneurial venture supported by the economic, political, and social framework. According to Bansal et al. (2019), women entrepreneurs are better aligned with sustainability and sustainable entrepreneurship than men. Hence, they generate greater value for society. Figueroa-Domecq et al. (2020) argued that further research into the influence of gender on sustainable entrepreneurship is essential because female entrepreneurship is a crucial factor in achieving the SDGs. The development of women entrepreneurship in tourism contributes to achieving SDG 5: Gender Equality and SDG 8: Decent Work and Economic Growth. Therefore, their study shows that sustainable entrepreneurship is linked to gender.

Interestingly, Nair (2020) linked and developed the concepts of female entrepreneurship and sustainable entrepreneurship, also including the concept of innovation. They argued that innovation and collaboration between stakeholders should be explored by benchmarking and moving away from an institutional support focus. Kaciak and Welsh (2020) studied the economic and political country context to analyse how women entrepreneurs develop and understand their link to sustainable economies.

Finally, Tovmasyan (2022) linked sustainable entrepreneurship with female entrepreneurial skills in the tourism sector. Their conclusions highlight the importance of continuing to analyse sustainable entrepreneurship from a gender perspective. Additionally, most authors have noted that female entrepreneurship is a crucial factor to achieve the SDGs.

3. Method

Our study conducts an analysis of bibliometric indicators, comparisons and graphical representations within the intersection between female and sustainable entrepreneurship. This analysis considers the chronology of the data gathered from the WoS Core Collection. VOSviewer was used to explore the relationships between different concepts and to observe the thematic proximity of the articles included in the analysis. VOSviewer enables data analysis at the aggregate level (Van Eck & Waltman, 2010). Its main functionalities include gaining visibility of information niches, detecting the evolution of keywords and identifying the year of publication of key articles (Mas-Verdú et al., 2021). Linking lines show the interactions between papers (Panchenko et al., 2020).

Due to the gap outlined in the introduction, our study proposes the following research question. Table 3 delineates the phases and steps followed to provide an answer to that question:

RQ: What key terms define the crossroads of female and sustainable entrepreneurship?

As shown in Table 3, in the first phase, all bibliometric studies indexed in the WoS Core Collection were searched for the term “female entrepreneurship”. In total, 13 articles published up to May 2022 were reviewed. These studies are detailed in Table 1. The first article was published in March 2018. The most recent article was published in August 2021. All bibliometric studies of sustainable entrepreneurship were then reviewed, also using the WoS. In total, 20 articles published before May 2022 were reviewed. These studies are shown in Table 2. The first article was published in April 2018. The most recent article was published in March 2022.

Table 3. Research phases and steps

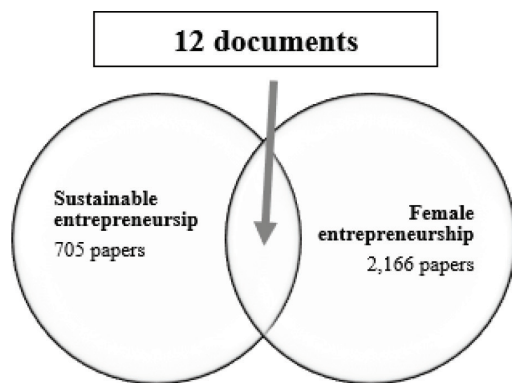
PHASE 1: THEORETICAL FRAMEWORK		PHASE 2: ADVANCED SEARCH AND DATA ANALYSIS	
STEP 1	STEP 2	STEP 3	STEP 4
Review of the bibliometric studies already conducted on female entrepreneurship and sustainable entrepreneurship:	Advanced search	Descriptive technique	Analytical technique
1. Bibliometric studies of female entrepreneurship (Seven research articles shown in Table 1)	Search of the intersection between female and sustainable entrepreneurship using WoS	Research into publications countries, research areas WoS categories and keywords	Most relevant terms and grouping of items into nine clusters using VOSviewer
2. Bibliometric studies of sustainable entrepreneurship (Twenty research articles shown in Table 2)			

Source: Own elaboration.

The second phase (Step 2) consisted of an advanced search between the main concepts analyzed in the Step 1, obtaining 12 documents indexed in the WoS Core Collection database. Two separate searches were conducted. The first search focused on female entrepreneurship. Drawing on the research of Santos et al. (2018), Moreira et al. (2019) and Deng et al. (2020) shown in Table 1, the following keywords (in all search fields) were used in the search: “female entrepreneur*” or “women entrepreneur*” or “gender entrepreneur*”. This search returned 2,166 results after filtering for “Articles”, “Review Articles”, “Notes”, “Books” and “Book Chapters”. The second search focused on the concept of sustainable entrepreneurship. Drawing on the studies of Thananusak (2019), Bezerra et al. (2021) and Terán-Yépez et al. (2020) shown in Table 2, the following keywords (in all search fields) were used in the search: “sustainab* entrepreneur*” or “sustainopreneurship” or “sustainab* start-up” or “responsib* entrepreneur*”. This search returned 705 results after filtering for Articles, Review Articles, Notes, Books and Book Chapters. As introduced before, using the advanced search option offered by the WoS, both searches were combined. This combined search focused on the intersection between these two areas. As shown in Figure 3, the search returned 12 articles for the period 1999 to 2022.

In the Step 3, different descriptive indicators were analysed. Finally, in the Step 4, co-occurrence analysis was carried out in VOSviewer using these 12 articles. This procedure revealed nine clusters of factors capable of accelerating or slowing down the female and sustainable entrepreneurial process. It also highlighted correlations between the clusters, shedding light to our research question.

Figure 3. Advanced search with a focus on the intersection between research fields



Source: Own elaboration.

4. Data analysis

4.1. Descriptive analysis within the tie between female and sustainable entrepreneurship

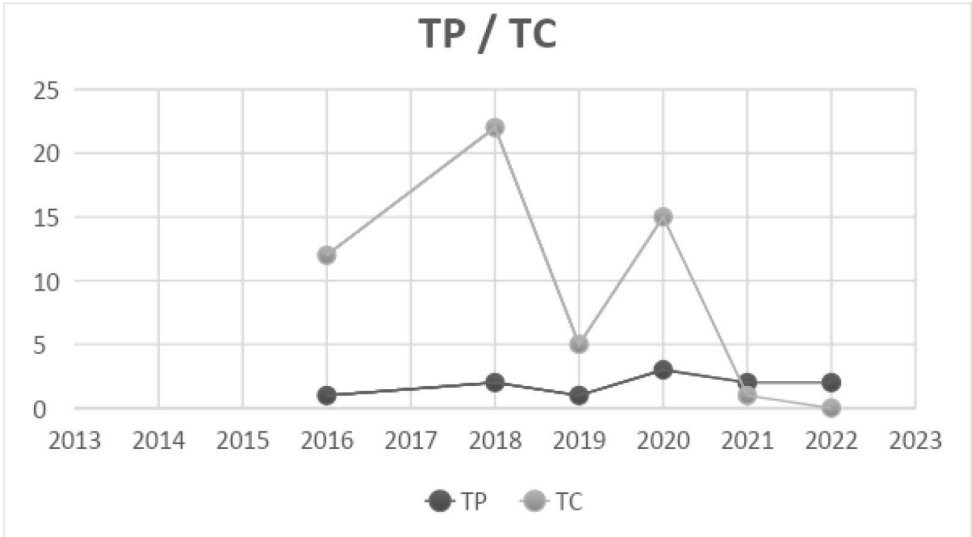
4.1.1. Evolution of the number of publications and citations within the intersection

The first of the 12 documents that deal with the intersection between female entrepreneurship and sustainable entrepreneurship was published in 2015 (Figure 4). The number of publications per year has remained relatively stable since. Accordingly, this topic is a recent research niche. However, according to Meyer (2018), the study of female entrepreneurship and sustainable entrepreneurial spirit is a growing area and has considerable potential for progress and improvement. Studies of the factors shaping the evolution of female entrepreneurship are recent. Further analysis of this topic is essential (Pathak et al., 2013; Aggarwal & Johal, 2021). Finally, another research avenue that could enrich the existing literature is the analysis of sustainable entrepreneurship and the motivations of entrepreneurs who engage in this form of entrepreneurship. The existing literature in this field is limited (Gu & Wang, 2022).

4.1.2. Countries with the most publications

The body of research exploring the development of women entrepreneurs is growing, as reflected by the data presented in the previous section. Nevertheless, it is important to understand the direction of this trend and to identify the countries where this research is taking place. As shown in Table 4, The United States and the United Kingdom are leaders in terms of the number of publications and citations of research on the intersection between female entrepreneurship and sustainable entrepreneurship. Santos et al. (2018) showed that scholars in these two countries have published the most on female entrepreneurship. Furthermore, according to Deng et al. (2020),

Figure 4. Evolution of the number of publications on female entrepreneurship and sustainable entrepreneurship



Source: Own elaboration.

Table 4. Countries with the most publications

Country	TP	TC	H-Index
INDIA	3	22	2
UK	2	5	1
PAKISTAN	2	1	1
ARMENIA	1	0	0
AUSTRIA	1	0	0
BANGLADESH	1	5	1
DENMARK	1	1	1
GERMANY	1	10	1
CHINA	1	0	0
SCOTLAND	1	5	1
SPAIN	1	0	0
TUNISIA	1	1	1
USA	1	12	1

Source: Own elaboration.

the United Kingdom and the United States have the highest number of publications on and sustainable female entrepreneurship. This finding highlights the need for coordination between researchers and countries, including those outside the OECD, to advance this field. According to Aggarwal and Johal (2021), the United Kingdom is one of main sites for research on the role of women entrepreneurship and its development in rural environments. There has also been a substantial increase in the number of researchers focusing on developing countries.

4.1.3. Total publications by research area

The two most relevant areas of research on the intersection between women's entrepreneurship and sustainable entrepreneurship are business entrepreneurship and the environment. The importance of these two areas shows that the intersection between these two forms of entrepreneurship is relevant not only at the business level but also at the environmental level. The leading journal in this area is *Business Economics*, which focuses on business. Santos et al. (2018) noted that most studies of female entrepreneurship (74.9%) focus on business, economics and firms. However, this trend is changing in other areas related to sustainability and gender inequalities. For example, Cardella et al. (2020) reported growth in the number of publications on female entrepreneurship in recent years, highlighting a shift in the focus on the business sector towards other areas that drive the gap between men and women. Finally, Barrachina et al. (2021) cited tourism as an incipient sector for women entrepreneurs. Figueroa-Domecq et al. (2020) also highlighted the importance of the tourism sector, describing it as a tool for achieving the SDGs. Table 5

Table 5. Research areas and main categories using the classification of the Web of Science

Research Areas	TP	TC	H-Index	Average per year
Business Economics	7	49	5	9,8
Science T echnology Other T opics	4	5	1	3
Environmental Sciences Ecology	3	1	1	1
Social Sciences Other T opics	1	5	1	1,7
Web of Science Categories	TP	TC	H-Index	Average per year
Business	5	39	4	7,8
Green Sustainable Science Technology	4	6	1	3
Environmental Sciences	3	1	1	1
Environmental Studies	3	1	1	1
Management	2	10	1	2,5
Hospitality Leisure Sport Tourism	1	5	1	1,7

Source: Own elaboration.

shows that *Hospitality Leisure Sport Tourism* is the seventh most relevant topic within this area of research, according to the categories established by the Web of Science (WoS).

4.2. Analytical exploration: co-occurrence analysis and cluster identification

Co-occurrence analysis of all keywords was carried out to show the most influential terms at the intersection between female entrepreneurship and sustainable entrepreneurship. Co-occurrence reveals the most relevant concepts in a given area and highlights limitations and possible future lines of research (Deng et al., 2020). The co-occurrence analysis in this study used all keywords as the unit of analysis. The minimum number of co-occurrences was one. In total, 117 words met this threshold, and nine clusters were identified. Because co-occurrence analysis uses a complete counting method, the minimum number of co-occurrences indicates the total number of occurrences of a term in the 12 documents studied. The characteristics of the analysis are presented in Table 6.

Table 6. Characteristics of co-occurrence analysis

Type of analysis	CO-OCCURRENCE
Counting method	Full counting
Unit of analysis	All keywords and references cited
Minimum number of occurrences of keywords	1
Items meeting the threshold	117
Number of clusters	9
Total number of links	938
Total link strength (TLS)	965

Source: Own elaboration using VOSviewer.

The following Table 7 shows the main keywords with a minimum of two occurrences. Considering the number of occurrences and the total link strength (TLS) enables more in-depth co-occurrence analysis (Cardella et al., 2020).

Cluster 1: Self-efficacy and self-sufficiency

First, the main keywords in Cluster 1 are opportunity recognition, self-efficacy, self-sufficiency and innovative capacity. Innovative capacity is explored further in Clusters 2 and 5. Concerning opportunity recognition, it is important to understand whether the context of women entrepreneurs limits their entrepreneurial initiatives (Lindberg & Johansson, 2017; Harrison et al., 2020). This recognition of opportunities is weaker when there are gender inequalities affecting women entrepreneurs

Table 7. Top keywords with a minimum of two occurrences

Cluster number	Keywords	Links	Ocurrences	TLS
1	Competitive advantage	27	2	28
1	Opportunity recognition	34	2	34
1	Self-efficacy	30	2	30
1	SMEs	38	3	40
2	Entrepreneurship	23	3	24
2	Sustainable entrepreneurship	71	7	81
2	Knowledge	16	2	16
3	Women entrepreneur	60	5	68
4	Empowerment	32	3	34
4	Gender	27	2	28
4	Sustainable Development Goals	20	2	21
5	Business	40	4	47
5	Challenges	23	2	24
5	Female entrepreneurship	39	4	46
6	Gender differences	29	3	34
7	Social entrepreneurship	23	2	23
7	Women entrepreneurship	38	4	39
9	Education	17	2	18
9	Sustainability	29	3	35

Source: Own elaboration using VOSviewer.

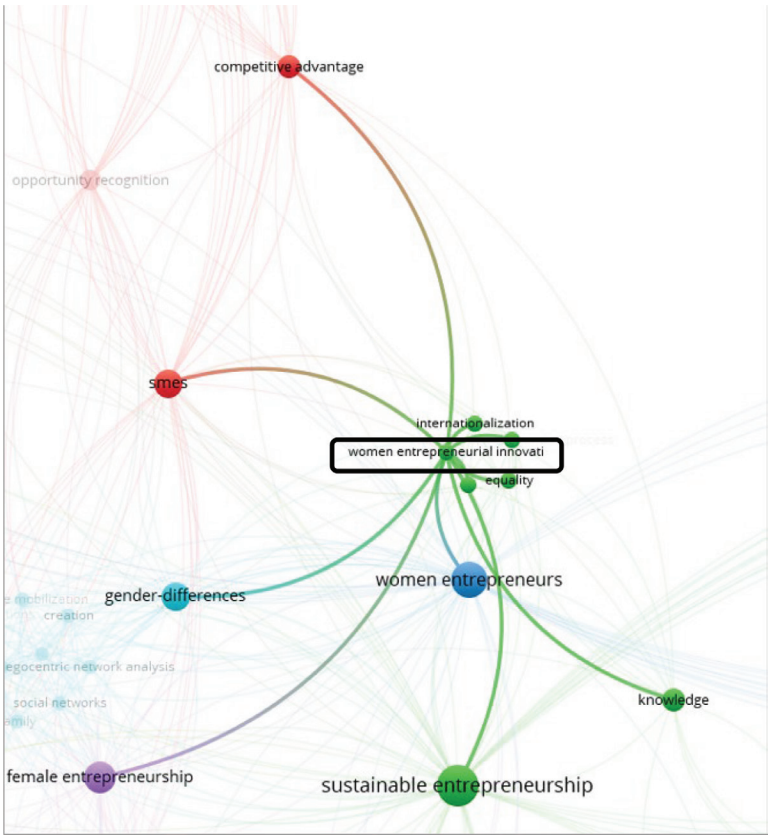
engaging in sustainable entrepreneurship (Xie & Wu, 2021). Women entrepreneurs look for tools that allow them to be self-efficient in their surroundings, seeking the self-sufficiency and autonomy that comes from starting their own venture. Studies should focus on empowerment. They should consider self-employment, entrepreneurship and the social differences that affect sustainable women entrepreneurs (Ousios & Farooqi, 2017; Aggarwal & Johal, 2021).

Cluster 2: Knowledge and female entrepreneurial innovation

Besides the concepts of entrepreneurship and female entrepreneurship, Cluster 2 contains the concepts of knowledge and female entrepreneurial innovation, which are also relevant to this study. The close link between female entrepreneurial innovation

and competitive advantage is presented in Figure 5; knowledge and internationalisation show that innovation capacity can help sustainable women entrepreneurs start ventures with a greater chance of success and scale them up through internationalisation strategies. To understand the internationalisation process and the reasons why it evolves differently from country to country, cross-country comparisons and studies of collaborations are essential (Moreira et al., 2019; Deng et al., 2020). Such collaborations create synergies with innovation and a willingness to take risks to generate competitive advantages (Kagbu, 2018; Santos et al., 2018; Nair, 2020). In this vein, Kagbu (2018) studied the situation of women farmers in Nasarawa (Nigeria), finding that women face many barriers in this sector because they cannot generate networks or optimise collaborations with each other. Other scholars point out the role of networks as a tool to foster female entrepreneurship and reinforce a sustainable community (Minimol, 2020) while improving the perception of market opportunities (Spiegler & Halberstadt, 2018).

Figure 5. The impact of women entrepreneurial innovation



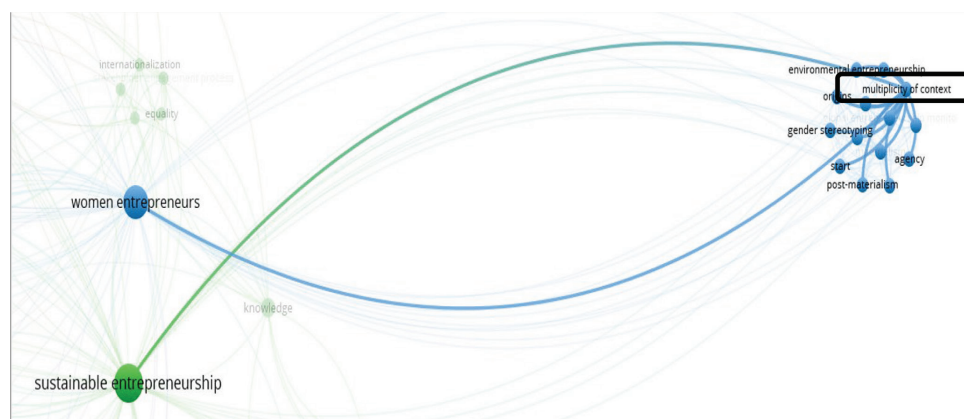
Source: Own elaboration using VOSviewer.

Cluster 3: Multiplicity of context, origins and gender stereotypes

In Cluster 3, the concept of women entrepreneurs has the most occurrences. However, the multiplicity of context, origins, gender stereotypes and rural credit programmes are also important.

The multiplicity of context is defined as the set of characteristics of the environment that influence the entrepreneurial process. Figure 6 demonstrates the link between multiplicity of context and sustainable entrepreneurship. This is why considering local contextual characteristics and how they differ from preestablished international generalisations is vital (Kemppainen, 2019) to further comprehend female and sustainable entrepreneurship development.

Figure 6. Multiplicity of context



Source: Own elaboration using VOSviewer.

Geographical areas, socioeconomic, religious, and political variables, and cultural backgrounds are contextual elements that can determine the development of female entrepreneurship (Santos et al., 2018; Mozumdar et al., 2020). For programmes in rural areas, Shuvam and Mohanty (2020) noted that establishing differences between urban and rural areas is a crucial aspect of the analysis of women entrepreneurship performance. To understand the growth of women entrepreneurship, Aggarwal and Johal (2021) also highlighted the need to differentiate between rural and urban environments. They showed that the multiplicity of context affects women entrepreneurs and sustainable entrepreneurship.

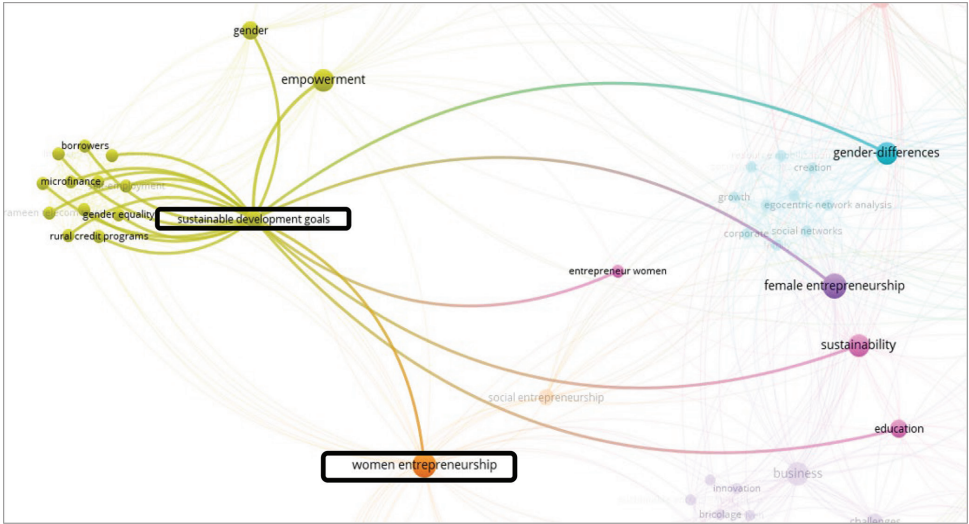
Therefore, the consideration of this concept in analyses of women entrepreneurship and sustainable entrepreneurship may enrich this research field. Policymakers should also look for possible solutions considering contextual idiosyncrasies (Harrison et al., 2020; Madanaguli et al., 2021). Meyer (2022) reported that women entrepreneurs seek to improve on a continuous basis and achieve business success, despite encountering obstacles in their environment.

Cluster 4: Sustainable development, gender equality, women’s empowerment, and Sustainable Development Goals (SDG’s)

Cluster 4 comprises the following terms: sustainable development, gender equality, developed countries, small businesses, women’s empowerment, women entrepreneurship, corporate social responsibility and Sustainable Development Goals (SDGs).

Figure 7 shows a strong link between Sustainable Development Goals (SDGs), sustainable entrepreneurship and female entrepreneurship. This strong link reinforces the premise of this study that links female entrepreneurship with sustainable development. Within the cluster, in addition to Sustainable Development Goals, gender equality is a key term, which is captured by SDG 5. In this sense, it is pointed out that female entrepreneurship favours the practical achievement of the Sustainable Development Goals (SDGs), specifically goals 5 (Gender equality) and 8(Employment, decent work for all and social protection) (Mas-Tur, 2022). Moreover, women entrepreneurship is presented as a tool for poverty reduction, improved perception of job opportunities and more equitable wealth distribution (Salim & Anis, 2021).

Figure 7. Links between SDGs and women entrepreneurship



Source: Own elaboration using VOSviewer.

Therefore, in support of the 2021 GEM Global Report (Global Entrepreneurship Monitor, 2021), in order to achieve organic and sustainable economic growth, while meeting the practical goals of the 2030 Agenda, the development of women entrepreneurs must be analysed. According to research by Islam and Sharma (2022), focusing

on the analysis of gender inequalities in entrepreneurship is necessary to achieve the SDGs. For small businesses, focusing on researching the role of innovation and female entrepreneurship is important (Madanaguli et al., 2021). Finally, corporate social responsibility is an enabler of organisations' sustainable development (Bezerra et al., 2021).

Cluster 5: Challenges, sustainable entrepreneurship, and innovation

Cluster 5 includes the following terms: challenges, enterprise, female entrepreneurship, sustainable entrepreneurship and innovation. Innovation and risk-taking skills positively influence entrepreneurship among women entrepreneurs in rural areas (Mandongwe & Jaravaza, 2020). There is a strong relationship between innovation, innovation policy, R&D and business performance, which leads to competitive advantages (López-Rubio et al., 2021). Lindberg and Johansson (2017) reported that innovation policies lead to changes in the gender perspective of entrepreneurship. Sustainable and female entrepreneurship requires innovation to ensure growth and impact (Nair, 2020). Innovation policies can therefore generate competitive advantages for female entrepreneurship and sustainable entrepreneurship. Female entrepreneurship is, therefore, an innovation enabler where education can be a promoter (Latchem, 2018).

Cluster 6: Gender differences

In Cluster 6, the concept of gender differences has three occurrences and 34 total links. This concept appears in three of the 12 documents studied. Currently, efforts are being made to study gender differences because they affect economic progress and competitiveness. These differences develop differently in each country (Barra-china et al., 2021). Figueroa-Domecq et al. (2020) confirmed the existence of gender differences and reported on how they affect entrepreneurs differently, focusing specifically on sustainable entrepreneurship and risk-taking capacity. Concerning the risk women take in the entrepreneurial process, initial financing is a critical step in which gender differences play a crucial role (Xie & Wu, 2021), in which education is a mitigator (Peake & Eddleston, 2021). Finally, Kemppainen (2019) adds that gender and contextual differences need to be analyzed to comprehend better female entrepreneurship and the degree of innovation in the entrepreneurial process.

Cluster 7: Social Entrepreneurship

In Cluster 7, we found the keyword of social entrepreneurship whose main mission is to generate a positive impact on society (Spiegler & Halberstadt, 2018), whether through job creation, access to essential services or the resolution of social problems

(Klimas & Wronka-Pośpiech, 2022). In this sense, the difference between social entrepreneurship and sustainable entrepreneurship is emphasized, the latter being the one that includes not only the social perspective but also the environmental one in the entrepreneurial process (Shepherd & Patzelt, 2011). Likewise, this keyword reinforces that female entrepreneur, beyond pursuing a profit motive, also seek a social purpose in their entrepreneurial projects, as introduced at the beginning of our paper.

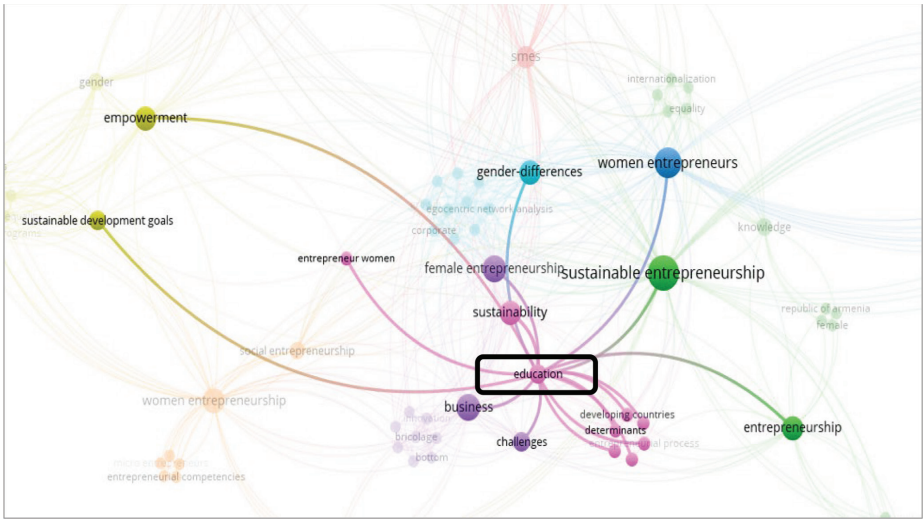
Cluster 8

It is noted that Cluster 8 includes general terms that score less than two occurrences. Thus, this cluster does not shed light on the fundamental elements and ties to the intersection analysed in this study.

Cluster 9: Education and sustainability

Finally, the most prominent terms in Cluster 9 are education and sustainability. As shown in Figure 8, education affects the growth of female entrepreneurship. Education is a key factor in the empowerment of women’s entrepreneurial intention (Bhardwaj, 2018; Pimpa, 2021). In this sense, the educational process followed by women entrepreneurs differs depending on personal and contextual variables. Latchem (2018) points to non-formalised and distance learning as an accelerator of the entrepreneurial process.

Figure 8. Education



Source: Own elaboration using VOSviewer.

An example of how education affects female entrepreneurship was provided by Aggarwal and Johal (2021) in India, where entrepreneurship education is a key element in understanding the development of female entrepreneurship and adding value to the local context. There is also a relationship between education and culture in each region. A comprehensive analysis of educational and cultural factors is necessary to determine the role of women entrepreneurs in national and international markets (Moreira et al., 2019). According to Cabrera and Mauricio (2017), education is indispensable for the growth of female entrepreneurship.

5. Conclusions

Answering the question posed in our research, this study outlines relevant terms such as multiplicity of context, innovation and education. These items are necessary to understand the evolution of female and sustainable entrepreneurship and to drive growth at the economic, political and social levels. To achieve such growth organically and sustainably, the United Nations (n.d) has cited a need to meet the practical goals (SDGs) set out in the 2030 Agenda. This study helps in this regard through analysis of the development and impact of women entrepreneurship. Along these lines, Islam and Sharma (2022) have confirmed that a focus on gender studies in entrepreneurship is fundamental for achieving the SDGs. The key terms identified in the analysis are multiplicity of context, innovation and education. Multiplicity of context refers to the idea that context is crucial to understand the development of female and sustainable entrepreneurship (Barrachina et al., 2021; Aggarwal & Johal, 2021; Meyer, 2022). Innovation is important because both sustainable entrepreneurship and female entrepreneurship require innovation to ensure growth and a practical impact (Nair, 2020; López-Rubio et al., 2021). Moreover, innovation fosters the creation and development of a sustainable entrepreneurial spirit (Sarango-Lalangui et al., 2018; Konys, 2019; González-Serrano et al., 2020). Innovation may also lead to the search for solutions to optimally cope with possible obstacles in the entrepreneurial process for women entrepreneurs. Concerning the recent open innovation approach, the impact of context needs to be further explored (Modaffari et al., 2023). Within such context, infrastructure and the degree of digitalisation (Ongo & Song, 2023), as well as soft skills (Karlsson et al., 2021), play a fundamental role.

Finally, education is crucial for female entrepreneurship and sustainable entrepreneurship and directly influences the entrepreneurial process (Cabrera & Mauricio, 2017; Cardella et al., 2020; Aggarwal & Johal, 2021; Ortiz-de-Urbina-Criado et al., 2022). Education can take different formats (Latchem, 2018) and this education heterogeneity is necessary to foster economic growth, especially in developing countries. In this sense, recent literature confirms female entrepreneurship as a promoter of economic and social and educational development (Salim & Anis, 2021).

About worldwide development, any other elements still need to be investigated. Examples include the growth of female entrepreneurship in rural areas and the effectiveness of policies. Furthermore, given the relationship between female

entrepreneurship and sustainable entrepreneurship and the SDGs, education and innovation, the following questions arise: Are SDGs 4, 5 and 8 the most closely linked? Moreover, do education and innovation lead to greater development and stronger linkages between women and sustainable entrepreneurship?

6. Future research lines and practical implications

To complement this study, further analysis of the most relevant terms is required to continue to fill the gap in the literature. Several paths should be explored to add value to the existing research. First, scholars should continue to analyse sustainability policies and to examine how they affect female entrepreneurship. According to Barrachina et al. (2021), this line of research is essential. The recommendation is not to use a micro approach, instead establishing comparisons and conducting case studies. Second, the relationship that female entrepreneurship and sustainable entrepreneurship share with SDGs 4, 5 and 8 in the literature published by Elsevier should be analysed. Elsevier is the world's largest scientific publisher. Using an advanced search, scholars can perform specific searches of the 17 SDGs in the Scopus database. Such an approach could reveal whether the subject matter of existing studies correlates with these SDGs. The analysis could also determine their status and where improvements can be made. It would be interesting to measure the alignment between women entrepreneurship, sustainable entrepreneurship, and SDGs 4, 5 and 8.

Third, it would be of interest to explore the concept of sustainable education further in the context of the female entrepreneurial process (Tillmar et al., 2022). Finally, it is important to differentiate between rural and urban environments (Aggarwal & Johal, 2021). There is still a gap in the research regarding the practical implications of sustainable entrepreneurship and the way in which it can influence women entrepreneurs (Nair, 2020; Camargo et al., 2020; Barrachina et al., 2021; Gu & Wang., 2022). In this vein, we reflect on the role of public policies and their effects on the sustainable impact of the female entrepreneurial process. Within the role of applied policies, distance and innovative training programmes are fundamental. These education programmes must be adapted to the contextual idiosyncrasies of women entrepreneurs. Such contextual characteristics influence women's innovativeness and performance (Kemppainen, 2019). Thus, fostering female entrepreneurship will generate better jobs and reduce social inequalities (Salim & Anis, 2021). This is why future researchers need to continue exploring the factors found within the environment of women entrepreneurs.

Declaration of Conflicts of Interest

The authors declare that they have no conflicts of interest in relation to the research, authorship or publication of this work.

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