



The Development of Sustainable Fashion: A Bibliometric Analysis Study

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ABSTRACT - The development of sustainability issues in the fashion industry has increased academic attention to sustainable fashion. This study aims to analyze (1) research trends, (2) author productivity and collaboration, (3) state productivity, (4) keyword development, (5) productivity of scientific journals globally. The method used was a quantitative bibliometric analysis of 251 Scopus indexed articles for the 2016-2025 period, with indicators of annual publications, state contributions, author collaboration networks, keyword frequency, and journal distribution. The dataset is limited to journal articles, open access, English, in the social sciences group, so that the findings are interpreted according to the scope. The results show a significant increase in publications from 2 articles in 2016 to 72 articles in 2025. Publications are dominated by the United Kingdom and the United States, while China and South Korea stand out in productivity and international collaboration. Author analysis identifies key authors with intense collaboration. The keywords sustainable fashion and sustainability dominate, reflecting a shift towards a more applicative and multidimensional approach. The novelty of this study lies in the comprehensive mapping of sustainable fashion trends for a decade (2016-2025) based on Scopus with the PRISMA approach and VOSviewer visualization. Overall, sustainable fashion is developing as a dynamic, collaborative, and strategic field of study in responding to the sustainable challenges of the global fashion industry.

Keywords: Sustainable fashion, bibliometric analysis, research trends, fast fashion.

INTRODUCTION

The rise of fast fashion practices with mass production and high waste makes the fashion industry a major environmental threat, along with the increase in global clothing consumption and production which is marked by an increase in textile production per capita from 5.9 kg to 13 kg per year (1975–2018) and the projected world clothing consumption is estimated to reach 102 million tons by 2030 (Niinimäki et al., 2020). This condition is exacerbated by the characteristics of fast fashion that emphasize production speed, low price, and perishability, thus encouraging a culture of disposable clothing and accelerating the increase in textile waste (Peters et al., 2021). This impact is most evident in the Global South region as a production center and destination for waste clothing disposal, thus encouraging the need for sustainable consumption models such as reuse, recycling, resale, as well as slow fashion and eco-fashion approaches to extend the life cycle of products (Bonelli et al., 2024).

In the face of negative impacts *fast fashion*, the sustainable approach in the fashion industry is getting more and more attention (Juliyanto & Firmansyah, 2024). *Sustainable fashion* emphasizing environmental and humanitarian value and encouraging the use of eco-friendly products with better quality and durability to reduce excessive consumption and textile waste (Sayyida & Wardaya, 2022). The high level of fashion waste confirms the urgency of responsible production and consumption, including the growing interest in used fashion as part of the shift towards a circular economy (Maula & Hery Supadmi Irianti, 2024).

At every stage of the global supply chain, the fashion industry generates complex and significant environmental impacts, from the use of water and chemicals in the production of fibers, yarns, and textiles to the CO₂ emissions generated during the manufacturing, distribution, and consumption of clothing. The globalization of textile and fashion production systems has led to an uneven distribution of environmental burdens, with developing countries as production centers bearing most of the ecological impact for developed countries as the main consumers of fashion products (Niinimäki et al., 2020). On the social side, the fast fashion model is often associated with low wages, poor working conditions, and a disproportionate burden of pollution borne by the Global South, thus raising global environmental justice issues (Bick et al., 2018).

Research shows that alternative management of clothing and textile waste has the potential to reduce waste through second-hand clothing markets, circular economy implementation, and textile recycling. However, its implementation requires technological support, investment, and community involvement, so a systematic study is needed to identify circular economy strategies and the use of textile waste, including pre-consumer waste (Ramírez-Escamilla et al., 2024). In line with these efforts, the concept of sustainable fashion emerged to increase public awareness of the negative impacts of using fashion products that are not environmentally friendly, while emphasizing the responsibility of the fashion industry, including the non-profit sector, in providing transparent information about worker conditions, environmental impacts, wage systems, and other social aspects (Sayyida & Wardaya, 2022). In terms of production processes, sustainable fashion products generally require higher costs due to the use of quality and environmentally friendly materials. However, these costs have the potential to be offset through long-term savings, given the better durability of the product so that consumers do not have to make repeated purchases of clothes (Pramodhawardhani et al., 2021).

The development of an increasingly broad and multidisciplinary literature demands systematic scientific mapping to understand the structure, dynamics, and direction of developing research. In this context, bibliometric analysis is important because it is able to identify key actors, patterns of international collaboration, dominant research themes, and major journals that shape the scientific landscape. This information plays a strategic role in formulating future research agendas, finding research gaps, and strengthening the development of *sustainable fashion studies* in a more targeted manner.

Academic attention to sustainable fashion has increased rapidly in the last decade. Systematic review and bibliometric studies show three main focuses of the study, namely consumer behavior towards sustainable clothing, the implementation of the circular economy in the fashion industry, and sustainability challenges along the supply chain (Abbate et al., 2024). Sustainable fashion research now focuses not only on the circular economy and eco-friendly design, but also on social responsibility, ethical practices, and supply chain transparency and traceability, reflecting increased awareness of social and environmental impacts in the fashion industry (Zhang & Zhang, 2025). However, despite systematic reviews, there is still a limited comprehensive quantitative mapping that specifically focuses on the dynamics of sustainable fashion research publications in the recent period using large databases such as Scopus (Abbate et al., 2024). The results of the bibliometric analysis show a consistent increase in scientific interest in sustainability issues in the fashion industry. During the period 2010 to May 20, 2024, there were 2,144 articles discussing sustainability in the fashion industry, focusing on environmental impacts, ethical consumption, and the challenges of adopting sustainable practices, especially in developing countries (Duque et al., 2025).

A number of bibliometric studies have been conducted to map the development of sustainable fashion studies, focusing on trends in publications, authors, journals, institutions, countries, and keyword analysis. (Zhang & Zhang, 2025) Specifically, it discusses publication trends, author contributions, institutions, countries, and keyword patterns in sustainable fashion research. (Duque et al., 2025) Analyze trends in publications, major journals, author contributions, and country distribution in fashion industry sustainability research. (Ricciardi et al., 2025) Highlighting keyword analysis, most prolific authors, productive journals, and the state's contribution to sustainable fashion studies. (Aggarwal et al., 2024) Examine the contributions of authors, institutions, countries, and major journals in sustainable fashion research. (Kashyap et al., 2023) Examining the most influential articles, journals with the highest citation rates, and the contributions of authors and countries in sustainable fashion research. (Zou et al., 2022) Discuss the contributions of authors, institutions, and countries, as well as analyze keyword patterns in sustainable fashion research. However, most of these studies have limitations in the form of relatively short analysis time spans, focus on only certain aspects, or have not taken advantage of the latest data updates to comprehensively describe the dynamics of research in the past decade. In addition, integrated mapping that specifically highlights cutting-edge periods with large, standardized databases like Scopus is still limited.

Based on this gap, this study contributes by presenting the latest quantitative bibliometric mapping of the development of *sustainable fashion* research for the period 2016–2025 based on the Scopus database. This study provides a comprehensive overview of publication trends, productivity of countries and authors, collaboration patterns, keyword development, and distribution of scientific journals, so that it can be a foundation for understanding scientific evolution and developing the direction of *sustainable fashion research* development in the future.

METHOD

This study uses a bibliometric study design with a quantitative-descriptive approach to map and analyze research developments in the field of *sustainable fashion*. Bibliometric analysis is carried out to map and describe research trends, the most productive authors, the country of origin of the publication, and the pattern of keywords in the specified field of study (Passas, 2024). The quantitative approach allows the objective processing of publication data based on bibliographic indicators, such as publication frequency and citation, while the descriptive approach is used to explain and interpret the results of the analysis in the form of tables, graphs, and network visualizations. Through this approach, the research is expected to provide a comprehensive picture of the intellectual structure, development direction, and research dynamics *sustainable fashion*, as well as identifying topic trends and potential research gaps that can still be developed in the future. The limitation of this study lies in the absence of citation analysis, so that the results of the study do not describe the level of influence or scientific impact of each publication, but focus on productivity and patterns of interconnectedness between bibliographic elements.

Data collection was conducted using the Scopus database, which is a database of reputable international scientific publications that provides literature *peer-review* as well as comprehensive search features for scientific search (Wibowo & Adriani Salim, 2022). The literature search and selection process was conducted systematically and illustrated using the PRISMA diagram, which is an evidence-based guideline for transparent and complete reporting of systematic reviews and meta-analyses (Simamora et al., 2024). The PRISMA diagram used in this study was adapted from (Page et al., 2021) which consists of three main stages, namely identification, screening, and included. At the identification stage, the search is carried out on the TITLE-ABS-KEY field using the keyword “*sustainable fashion*”. The search is limited to the 2016–2025 publication year range to represent the latest research developments. From this process, 1,535 documents were obtained. The next stage is screening which is carried out in stages. The first screening was carried out based on the subject area of Social Sciences to ensure the suitability of the document with the context of social studies and humanities in sustainable fashion research. This stage resulted in 544 documents. The second screening was carried out based on the type of document, by limiting only journal articles, so that the number of documents was 418 articles. The third screening was carried out by considering the source type of the journal, the language of English publication, and the availability of open access. These criteria are applied to guarantee the quality, readability, and accessibility of the data sources analyzed. After this stage, 251 documents were obtained. At the inclusion stage, all 251 documents that met the selection criteria were used as the final dataset for bibliometric analysis. This dataset was then analyzed to map publication trends, state contributions, author productivity, and keyword developments in sustainable fashion research. The entire flow of data collection and selection is visualized through the PRISMA diagram can be seen in **FIGURE 1**.

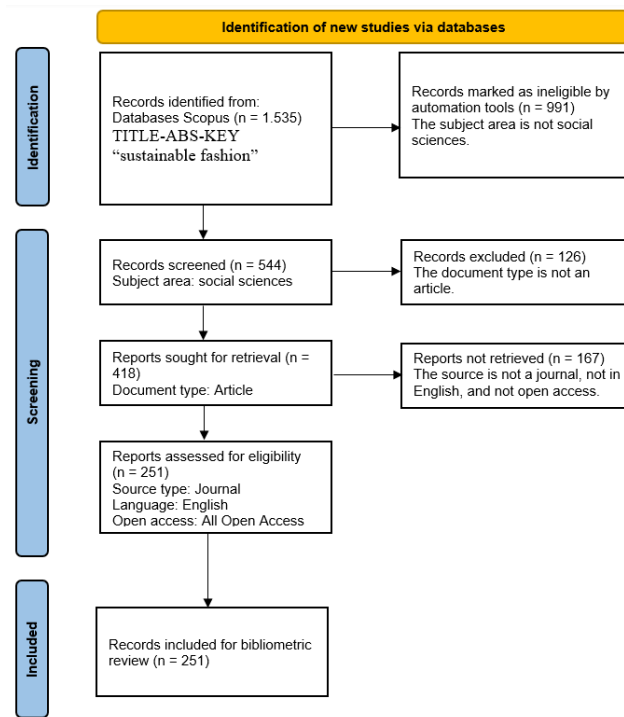


FIGURE 1. PRISMA flowchart.

Data analysis was carried out using VOSviewer software to map and analyze the bibliometric characteristics of sustainable fashion research. VOSviewer is a tool designed to visualize bibliometric data, allowing the analysis of authors' collaborative networks and relationships between research topics (Simamora et al., 2024). The unit of analysis in the mapping includes research trends, authors, countries, keywords, and journals. This analysis includes the identification of annual publication trends to see the development of research over time, as well as the analysis of the contributions of authors, journals, and countries to find out the parties that play the most role in research in this field. Furthermore, keyword occurrence analysis is used to find out the most frequently used keywords in publications as well as the relationships between these keywords. This analysis aims to illustrate the main focus and theme of sustainable fashion research. The results of the analysis are presented in the form of a visual map that shows the relationship between topics, the development of the topic over time, and the level of research intensity, which is then described descriptively to understand the direction and development of sustainable fashion studies. Keyword mapping is carried out with a full counting method and a minimum occurrence threshold of 5 times so that only the most representative terms are visualized. The types of visualization used in VOSviewer are network visualization to see the relationships between analysis units and density visualization to identify the most intense topic areas.

RESULTS AND DISCUSSION

Publication Trends

Bibliometric analysis shows a significant and sustained increase in scientific interest in sustainability issues in the fashion industry over the past ten years (Duque et al., 2025). The number of annual publications is an important indicator for assessing the development of scientific research, as it reflects the growth of knowledge, the level of maturity of the field of study, and can be used to evaluate and predict the direction of research development (Ou et al., 2024). Based on these indicators, the trend of scientific publications in the field of sustainable fashion during the period 2016–2025 shows a consistent and significant increase. Of the 251 articles analyzed, the number of publications each year shows a clear pattern of increase, which indicates the increasing attention of academics to sustainability issues in the fashion industry.

At the beginning of the research period, the number of publications was still relatively low. In 2016 there were only 2 articles, then it increased to 5 articles in 2017. The upward trend continued in 2018 and 2019 with 7 and 8 articles, respectively. The increase began to be more noticeable from 2020 with 12 articles, which then increased to 19 articles in 2021. The growth of publications was stronger in the following period. The number of articles increased to 34 articles in 2022 and 40 articles in 2023, before experiencing a sharper increase in 2024 with 52 articles and reaching a peak in 2025 with 72 articles. The significant growth trend in the 2021–2022 period reflects the increasing interest and research activity in this area, influenced by the spread of sustainability ideas as well as a shift in focus and attention in research (Zhang & Zhang, 2025).

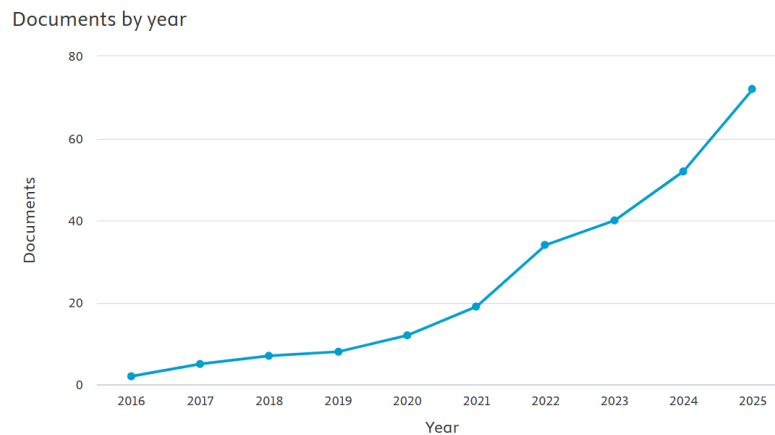


FIGURE 2. Sustainable fashion research publication trends.

The surge in the number of publications in this period shows that sustainable fashion is increasingly seen as a strategic issue closely related to global environmental challenges, the application of circular economy principles, and the demand for more responsible production and consumption practices. This increase also reflects the expansion of the scope of the study that not only focuses on design aspects, but also includes supply chains, consumer behavior, material innovation, and sustainability policies in the fashion industry. This pattern indicates an increasing focus of academics on sustainability in the fashion industry, triggered by global environmental issues as well as changing consumer value orientations (Naila et al., 2025).

Overall, the publication trend confirms that research on sustainable fashion has developed rapidly in the past decade. The increase in the number of publications not only reflects the increase in academic interest, but also shows the deepening and maturation of studies, thereby strengthening the position of sustainable fashion as a relevant, dynamic, and ever-growing field of research in the global academic discourse. Focusing on current time periods allows for more up-to-date and relevant analysis, while increasing the accuracy of results as well as their relevance to sustainable product development challenges in the textile and fashion industries (Ricciardi et al., 2025). The sharp increase in publications shows that sustainable fashion has developed into an increasingly established field of study and has received wide attention globally. This surge also signals increasing academic awareness of the urgency of sustainability issues in the fashion industry as well as the opening up of opportunities for cross-disciplinary collaboration.

Country Productivity

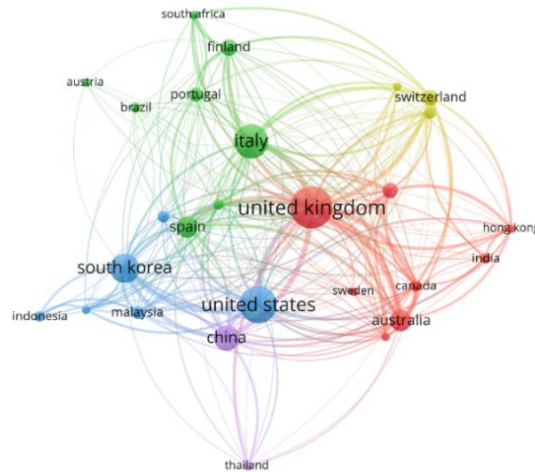


FIGURE 3. Network map showing cooperation between countries.

This analysis highlights the global nature of sustainability in the textile industry, with contributions from different countries enriching the scientific community around the world (Duque et al., 2025). This analysis identifies the most productive countries in the research area studied. In the calculation of country contributions, articles written by researchers from different countries are counted as contributions to each author's country of origin, while articles written by two or more researchers from the same country are counted only once for that country (Abbate et al., 2024). This approach allows for more accurate mapping of scientific productivity and patterns of international collaboration in sustainable fashion research.

Based on the top ten countries, sustainable fashion research publications show that scientific production is still dominated by countries with strong research capacity and extensive international academic networks. The United Kingdom topped the list with 37 articles, and had a network of collaborations with 25 countries. The high number of publications accompanied by the breadth of international collaboration shows the central role of the United Kingdom in the development of sustainable fashion studies, both as a producer of knowledge and as a liaison between researchers across countries. This condition reflects the strong research ecosystem that supports the integration of sustainability issues, public policy, and design innovation in the fashion industry. In addition, the United Kingdom is recorded as the country with the strongest total link strength (Sadrul et al., 2023).

The United States is in second place with 32 articles and a collaborative network that covers 24 countries. The combination of high publication productivity and extensive international collaboration confirms North America's important role in shaping the direction of sustainable fashion research, particularly in the development of sustainable business models, technological innovation, and policy and regulatory approaches. This pattern shows that the United States' contribution is not only quantitative, but also strategic in expanding global research networks.

The contribution of Asian countries is increasingly significant, especially South Korea with 22 articles and a collaboration network with 25 countries, and China with 18 articles and collaborations with 24 countries. This high level of collaboration demonstrates the openness and integration of Asian research in the global network of sustainable fashion. As a region that plays an important role in the supply chain of the global fashion industry, research focuses on the issues of sustainable production, resource efficiency, and the social and environmental impact of the textile and apparel industries. The findings also show that while the number of publications in Western countries is still generally higher than in Eastern countries, China and South Korea are important exceptions with comparable levels of productivity and collaboration, signaling the strengthening role of East Asia in global sustainable fashion research (Rahman et al., 2023).

Australia and Spain each recorded 14 articles, with a relatively extensive international collaboration network, with 22 countries for Australia and 24 countries for Spain. These findings show that although the number of publications is not as high as the United Kingdom or the United States, the two countries have an active role in cross-border

research collaboration. Australia contributes primarily to the study of consumer behaviour, material innovation, and environmental policy, while Spain shows engagement in social and cultural approaches to sustainable fashion.

Other European countries, such as Germany with 9 articles and collaborations with 21 countries, Finland with 9 articles and collaborations with 20 countries, and Switzerland with 9 articles and collaborations with 22 countries, show a stable pattern of contributions. Although the number of publications is relatively lower, the high level of international collaboration reflects the important role of these countries in the development of sustainable designs, environmentally friendly textile technologies, as well as sustainability-based innovation models. The rapid increase in interest and investment in sustainable fashion reflects a broader economic and cultural shift towards sustainability in these countries (Zhang & Zhang, 2025).

Overall, the correlation between the number of publications and collaboration networks suggests that countries with high research productivity tend to have extensive international collaboration networks. This pattern confirms that sustainable fashion research is developing as a highly collaborative global field of study, where cross-border knowledge exchange plays an important role in enriching perspectives, accelerating innovation, and strengthening a comprehensive understanding of sustainability challenges in the fashion industry.

The dominance of Western countries shows that the center of knowledge production is still concentrated in the developed region, while the contribution of the Global South countries is relatively limited. This condition indicates the need to expand research in developing countries, which are the production centers of the global fashion industry, so that sustainability solutions are more contextual and geographically fair.

Author Productivity

The distribution of publications based on the top seven authors shows a concentration of scientific contributions in a group of researchers who consistently examine sustainable fashion issues during the observation period. These findings show that the development of sustainable fashion studies is not only reflected in the increase in the number of publications in aggregate, but is also influenced by the existence of key authors who play an active role in building, expanding, and maintaining academic discourse in the field. Characterizations, and approaches to this concept have been developed in the literature, reflecting the complexity and multidimensionality of sustainability issues in the fashion industry (Schiarioli et al., 2025).

Sara Greco is recorded as the most prolific writer with the highest number of publications, which is 4 articles, and has a collaborative network with 7 other authors. Sara Greco's high productivity, accompanied by a relatively stable level of collaboration, indicates her central role in the development of sustainable fashion studies. Experience in various research areas strengthens the ability of researchers to adapt and participate in multidisciplinary projects (Feng & Kirkley, 2020). In addition, engagement in cross-author collaborations reflects efforts to integrate diverse perspectives and methodological approaches, thereby enriching the quality and depth of the research produced. This pattern shows that Sara Greco's contribution is not only individual, but also oriented towards strengthening academic networks.

The next group of writers consists of Taylor Brydges, Barbara De Cock, João Ferreira, Ana Neto, Kim Youn Kyung, and Claudia E. Henninger, who each produced 3 articles. Although the productivity levels of publications are relatively uniform, analysis of collaborative networks shows differences in the intensity and scope of academic cooperation between them. Taylor Brydges is recorded as having a collaborative network with 11 authors, which indicates active involvement in collaborative research and an extensive academic network. This high level of collaboration reflects Taylor Brydges' role in connecting researchers and expanding the scope of sustainable fashion studies from various perspectives.

A similar pattern of collaboration is also seen in João Ferreira and Ana Neto, who each collaborate with 11 other writers. This high level of collaboration confirms the important role of the two in building a dynamic research network, especially in examining aspects of sustainable production, innovation in the fashion industry, and the social and environmental implications of fashion practices. Involvement in cross-author collaboration allows for knowledge exchange across disciplines and institutions, thus enriching the quality of academic discourse in the field *sustainable fashion*. In addition, international collaborations allow researchers to blend diverse resources, expertise, and methodologies, ultimately enhancing research effectiveness in dealing with complex global issues (Yadigarova, 2025).

Meanwhile, Barbara De Cock and Kim Youn Kyung each have a collaborative network with 6 writers. Although their level of collaboration was relatively more moderate than that of the other authors in this group, their involvement still showed a consistent contribution to collaborative research. This pattern reflects a balanced research approach

between the development of individual ideas and academic cooperation, which still contributes to the diversity of perspectives in the study of sustainable fashion.

Claudia E. Henninger shows different characteristics with the highest level of collaboration, involving 16 authors, although the number of publications is equivalent to that of other authors in this group. This high level of collaboration indicates the role of Claudia E. Henninger as the main node in the sustainable fashion research network. This position reflects his ability to connect researchers, expand international research networks, and encourage the integration of various conceptual and methodological approaches in the study of sustainable fashion. In addition to producing a number of publications in reputable international journals, Claudia E. Henninger also plays an active role as an executive member *Sustainable Fashion Consumption Network* and the chairman *Special Interest Group (SIG) Sustainability on Academy of Marketing*, which further strengthens its position in shaping and directing the academic discourse of sustainable fashion (Aggarwal et al., 2024).

Overall, this analysis shows that publication productivity and collaboration intensity do not always go hand in hand, but complement each other in shaping the dynamics of sustainable fashion research. Some authors stand out through their high individual productivity, while others play an important role through extensive collaborative networks. The combination of these two aspects reflects that the development of sustainable fashion studies is driven by the collective contributions of various authors, not by the dominance of a single figure.

Furthermore, the pattern of collaboration between authors confirms that sustainable fashion develops as a multidisciplinary and collaborative field of study. The complexity of sustainability issues in the fashion industry that includes aspects of design, production, consumption, policy, and socio-environmental impact demands a research approach that involves a wide range of expertise and scientific backgrounds. Therefore, the high level of collaboration between authors can be understood as a response to the complexity of the problems being studied. In addition, the analysis of prolific authors and influential publications provide opportunities for young researchers to understand the significant contributions in this discipline while expanding their network of expertise (Hora et al., 2023). The broad pattern of collaboration shows that sustainable fashion research is increasingly collaborative and multidisciplinary. This is important because sustainability issues in the fashion industry are not only related to design, but also economic, social, environmental, and public policy.

Thus, the top authors identified in this analysis can be seen as key actors in shaping the direction, focus, and development of sustainable fashion research. The sustainability of their contributions and collaboration networks has the potential to influence the evolution of research themes, strengthening methodologies, and forming sustainable fashion research agendas in the future. These findings also confirm the importance of academic collaboration in encouraging the progress and relevance of sustainable fashion studies in a global context. In general, these authors occupy a strategic position in the development of research on sustainable product innovation, which at the same time shows the strong linkage between innovation, sustainability principles, and the material and fashion sectors as an important foundation in the development of sustainable fashion theory and practice (Ricciardi et al., 2025).

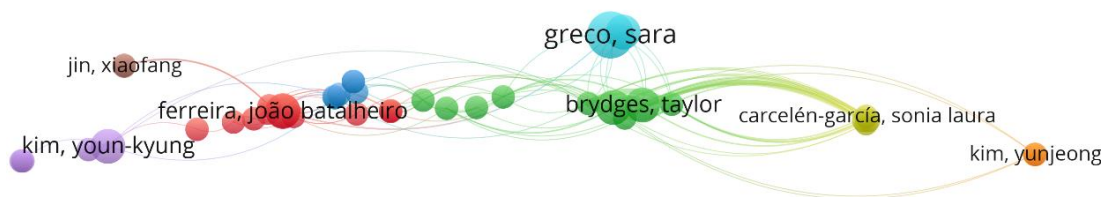


FIGURE 4. Network map showing collaboration between authors.

Keyword Analysis

The keyword analysis provides an overview of the thematic focus and direction of development of sustainable fashion research during the study period. The results of the analysis show that the term *sustainable fashion* is the most dominant keyword with a frequency of 100 appearances. This dominance confirms that sustainable fashion has become a central concept and a key framework in the literature analyzed, as well as serving as an umbrella for various approaches and research topics related to sustainability in the fashion industry. Furthermore, keyword grouping analysis in bibliometry has proven to be beneficial for identifying research gaps, finding new directions for future studies, and fostering cross-disciplinary collaboration (Zhang & Zhang, 2025).

Keywords *sustainability* appeared 53 times, which shows a strong link between sustainable fashion studies and sustainability discourses in general. These findings indicate that sustainable fashion research does not stand in isolation, but is integrated into a broader sustainability discourse, covering environmental, social, and economic dimensions. Thus, sustainable fashion is positioned as part of global efforts in responding to sustainable development challenges. Additionally, the keywords with the strongest citation spikes can be used to reflect the main focus of a research topic over time, while also highlighting research trends in a given period (Zou et al., 2022).

Concept *circular economy* There were 27 appearances, indicating increasing attention to the circular economy approach as the main strategy in supporting the sustainability of the fashion industry. Keyword analysis provides insight into research trends in a journal, as it reflects the focus of the article and the author (Ou et al., 2024). The emergence of these keywords indicates a shift in research focus from a linear approach to a model that emphasizes resource efficiency, material recycling, and product lifecycle extension. These findings reflect a growing body of research that integrates circular economy theory with design, production, and waste management practices in the fashion industry.

The keywords *fashion* (23 appearances) and *fashion industry* (19 appearances) indicate that most of the research focuses on the industry context as a whole, not just on conceptual or normative aspects. These findings show that the study of sustainable fashion is largely directed at the analysis of industrial systems, including production structures, supply chains, and business dynamics in the fashion sector. This approach shows the researchers' efforts to bridge the concept of sustainability with the realities and practices of the industry.

Furthermore, the appearance of the keyword *fast fashion* 14 times reflects the critical attention to the fast and massive production and consumption model. The fast fashion model is often associated with various environmental and social problems, so its appearance in the literature shows the tendency of research to examine the negative impact of the conventional fashion system and look for more sustainable alternatives. In line with that, the keyword *sustainable fashion consumption* that appeared 11 times indicates an increasing focus on research on consumer behavior and the role of individuals in driving the transition to more responsible fashion practices.

Other keywords such as *sustainable development* (7 appearances), and *slow fashion* and *circular fashion* which appeared 6 times each, showing that although these themes had not yet dominated, alternative approaches to the conventional fashion system were beginning to gain attention in academic studies. The appearance of this keyword indicates an initial exploration of fashion models that are more ethical, sustainable, and long-term oriented, both in terms of production and consumption. This is also reflected in the visual representation of the keyword map, where the size of the letters and circles indicates the frequency with which words appear, while the thickness of the curved lines reflects the strength of the link, with larger sizes and lines indicating higher frequencies and connections (Rahman et al., 2023).

The dominance of keywords such as *circular economy* shows a shift in the focus of research from conceptual discussions to a more applicative and systemic approach. The emergence of themes related to consumer behavior also indicates that sustainability solutions do not only rely on production, but also on changes in people's consumption patterns.

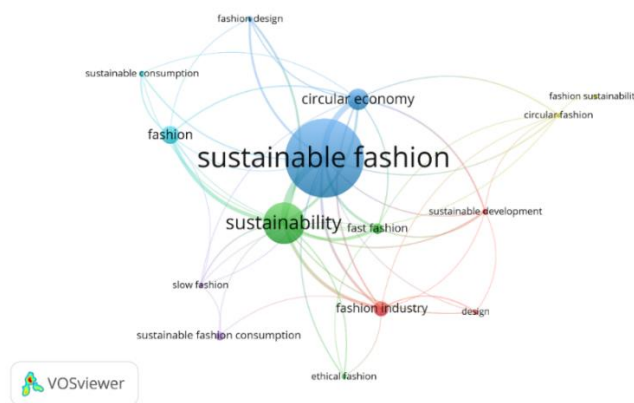


FIGURE 5. Network map showing keywords.

Overall, the keyword analysis revealed that the research *sustainable fashion* has evolved thematically, moving from a general discussion of sustainability to a more specific and applicable focus, including the circular economy, sustainable consumption patterns, and criticism of practices *fast fashion*. These findings confirm that the study *sustainable fashion* is multidimensional, encompassing environmental, economic, social, and behavioral aspects, while reflecting the complexity of sustainability challenges in the fashion industry. Thus, keyword analysis not only highlights the dominant topics, but also indicates the direction of evolution and deepening of research in the global academic discourse. Furthermore, the visualization of the keyword map shows that current scientific interest focuses on the evaluation of collaboration between authors, measures of productivity, and research impact, emphasizing the linkage between the structure of research networks and the dynamics of the development of this field (Yadigarova, 2025).

Journal Productivity

Research publications *sustainable fashion* spread across various international journals, with some journals occupying the most productive position in disseminating literature in this field. *Sustainability Switzerland* is top-ranked with 101 articles, demonstrating its role as one of the main forums for research publications focused on sustainability issues, including in the context of the fashion industry. *Sustainability Switzerland* is the most productive and most frequently chosen source for research related to slow fashion and sustainable fashion (Aggarwal et al., 2024). The dominance of this journal indicates that the study *sustainable fashion* tends to be placed within a broader and multidisciplinary sustainability framework, covering environmental, social, economic, and public policy aspects.

In addition to *Sustainability Switzerland*, *Fashion Highlights* ranked second with 20 articles, followed by *Sustainability Science, Practice and Policy* with 12 articles. The existence of these journals shows that sustainable fashion research is not only developing in general sustainability-based journals, but also in more specific journals discussing sustainability practices, policies, and applications. This pattern confirms the close relationship between the development of theory and the practical implementation of sustainable fashion in the context of industry and society. In addition, publication in relevant journals allows authors to strengthen the knowledge center *sustainable fashion*, encourage thematic discussion, more in-depth research, and the development of subfields within this discipline (Özdil & Konuralp, 2025).

Several other journals contributed albeit with a more limited number of publications. *Fashion and Textiles* contributed 7 articles, while *Fashion Theory: Journal of Dress, Body and Culture* published 6 articles that emphasized the theoretical, cultural, and social dimensions in sustainable fashion studies. Journals such as *International Journal of Fashion Design, Technology and Education*, *Business Strategy and the Environment*, *SAGE Open*, and *Cleaner and Responsible Consumption* Each contains 5 articles, which show the consistency of interest in design innovation issues, sustainable business strategies, and changes in consumption behavior. In addition, *Discover Sustainability* and *Fashion Practice* Each contributes 4 articles, which enrich the literature through empirical approaches and practice-based studies. This shows the growing awareness from practitioners and academics alike, although researching sustainability in a complex and globally dispersed fashion industry remains a challenge (Karaosman et al., 2017).

The distribution of publications in these journals indicates that although there are journals that are the center of publication dominance, sustainable fashion research continues to develop in a dispersed and cross-disciplinary manner. This condition reflects the nature of sustainable fashion studies as a complex and multidimensional field, which requires contributions from various scientific perspectives, ranging from textile design and technology to social, economic, and policy sciences. Thus, the concentration of publications in certain journals not only shows the popularity of the topic, but also plays a role in shaping the direction of academic discourse and influencing the development of sustainable fashion theory and practice at the global level. In addition, publication in relevant journals allows authors to strengthen the knowledge center *sustainable fashion*, encourage thematic discussion, more in-depth research, and the development of subfields within this discipline (Sadrul et al., 2023).

The concentration of publications in sustainability-themed journals shows that sustainable fashion has been recognized as part of the discourse of sustainable development. However, the focus on specific journals and the limitations of data selection (English, open access, and one database) suggest that these mapping results still have limited literature coverage. Further research is suggested to expand the keywords, use additional databases such as the Web of Science, as well as add citation analysis or topic modeling approaches to enrich the understanding of the scientific structure of this field.

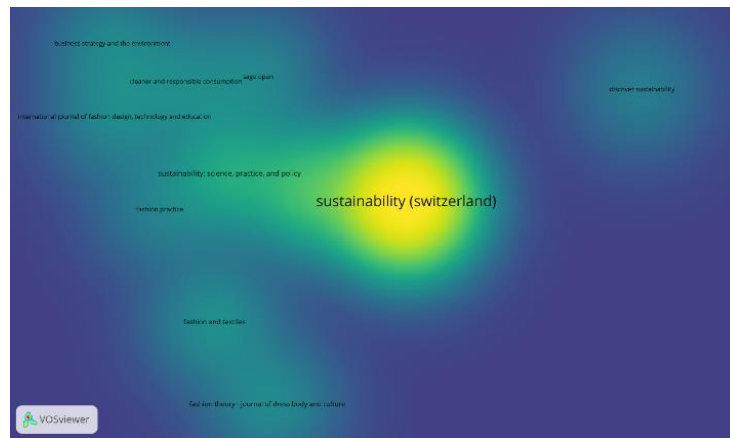


FIGURE 6. Network map showing journals.

CONCLUSION

Based on the results of bibliometric analysis, it can be concluded that research on sustainable fashion has undergone significant development, is global, and is increasingly mature academically. This development is reflected in the increase in the number of publications, the contribution of countries and authors, the dynamics of research themes through keywords, and the concentration of publications in certain journals.

- 1) Sustainable *fashion* research shows a very sharp increase during the observation period, from just 2 articles in 2016 to 72 articles in 2025. This consistent improvement indicates that sustainability issues in the fashion industry are getting more and more serious attention at the global academic level. These findings imply that this field has developed into a strategic research area, so further research needs to move from conceptual studies to empirical studies that test the implementation of sustainability practices in the fashion industry in real terms.
- 2) In terms of state productivity, the research was dominated by the United Kingdom with 37 article publications and the United States with 32 publications, followed by significant contributions from China and South Korea. This shows that despite being global, knowledge production centers are still concentrated in a specific country. The implication is that cross-regional research collaboration, especially with Global South countries as the production center of the fashion industry, needs to be strengthened so that the research perspective is more inclusive and representative of the real impact of the fashion industry.
- 3) The analysis shows a concentration of contributions to a number of key researchers, with Sara Grecco (4 articles) as the most prolific author. In terms of collaboration, Claudia E. Henninger has the widest network of collaborations with 16 other authors. These findings confirm that the development of *sustainable fashion studies* is strongly supported by collaborative networks. In the future, strengthening multidisciplinary collaboration across countries and scientific fields will be an important agenda to produce more comprehensive sustainability solutions.
- 4) The keywords sustainable fashion (100 appearances) and sustainability (53 appearances) are the most dominant terms, followed by *the circular economy*, *fashion*, and *fashion industry*. This shows that the research focus is largely directed at the sustainability and circular economy framework in the fashion industry system. However, the density of themes on environmental aspects and industrial systems indicates that social dimensions such as worker welfare, production ethics, and supply chain justice are still relatively underexplored. Thus, the future research agenda needs to better balance the integration of environmental, economic, and social aspects in the study of *sustainable fashion*.
- 5) Publications are concentrated in specific journals, with Sustainability (101 articles) being the most productive journal, followed by Fashion and Textiles (20 articles) and Sustainability Science and Policy and Practice (12 articles each). This pattern shows that the study of *sustainable fashion* has been established in the realm of sustainability-themed journals as well as connected to fashion disciplines and policies. The implication is that further research has the opportunity to expand publications to other cross-disciplinary journals, such as circular economy, material technology, and social studies, in order to enrich scientific approaches to the sustainability of the fashion industry.

Overall, the integration between the trend of increasing publications, country dominance and diversification, the role of key authors, the development of themes through keywords, and journal concentrations shows that sustainable fashion has developed into a strategic, dynamic, and relevant field of research in responding to the challenges of the sustainability of the fashion industry at the global level.

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