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Article

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Mapping the history, trajectory, and anatomy of slow and sustainable fashion: a bibliometric analysis

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ABSTRACT

This research analysis was conducted to explore the evolution of scholarly work on slow fashion, which prioritizes ethical production, sustainability, and transparency in the fashion industry. Utilizing bibliometric analysis with Biblioshiny and VOSviewer on a dataset of 343 documents, the study aimed to identify influential perspectives and significant research goals in this domain as bibliometric study aims to bridge the research gap by tracking the development of slow fashion and identifying both well-researched and emerging areas ripe for future investigation. The findings revealed a notable increase in the publication-to-citation ratio over recent decades, with 'Sustainability Switzerland' being the leading journal (90 publications) and Choi-T-M recognized as the most prolific author. Hong Kong Polytechnic University ranked first in institutional contributions, while collaboration was strongest among researchers from the USA, UK, and China. Sustainability emerged as a central theme, showing the highest link strength, and future trending topics included corporate social responsibility, consumer behavior, and ethical fashion. This analysis enhances the understanding of slow fashion's integration with sustainable practices and provides a roadmap for emerging researchers in the field.

ARTICLE HISTORY

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Environmental Economics;
Environment & the Developing World;
Sustainable Development

1. Introduction

The fashion industry significantly contributes to ecological degradation, primarily due to fast fashion practices and the production of inexpensive garments. For instance, over 75% of fast fashion clothing is discarded in landfills. As alternatives, slow fashion and thrift store shopping promote sustainable consumption habits (Brewer, 2019). Slow fashion represents a strategic shift towards ethical and sustainable practices, contrasting sharply with fast fashion's focus on cheap, mass-produced apparel. It encourages consumers to prioritize quality over quantity by purchasing fewer, long-lasting items. Research highlights the severe social and environmental issues within the global textile industry, particularly in developing countries like China and India, where low wages and poor working conditions are prevalent (Salcedo et al., 2021). Children and teenagers are often subjected to hazardous environments, while workers earn meager wages (1% to 2% of a garment's sale price) and are exposed to harmful chemicals that threaten both human health and ecosystems. Addressing these challenges is essential for achieving Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth) and Goal 12 (Responsible Consumption and Production). (Chen et al., 2017) emphasize the importance of implementing changes throughout the textile supply chain, aligning with SDG 12's focus on sustainable production practices. (Corcelli et al., 2018) argue that sustainable manufacturing is crucial for conserving

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natural resources and mitigating environmental harm, while (Todeschini et al., 2020) note the industry's increasing openness to sustainable innovations. Additionally, (Testa et al., 2022) suggest that brands prioritizing social responsibility and sustainable alternatives experience greater consumer acceptance, inspiring further action across the sector. As consumers become more aware of environmental issues, there is a pressing need for businesses to adopt sustainable practices to meet this demand (Aggarwal, 2023). Also, slow and sustainable fashion represents a transformative shift in the fashion industry, emphasizing ethical practices, environmental stewardship, and social responsibility. As a significant contributor to global ecological degradation, the fashion industry faces pressing challenges, including excessive waste, resource depletion, and labor exploitation (Gardetti & Muthu, 2020). In response, slow fashion promotes a mindful approach to consumption, prioritizing high-quality, durable garments over the fast-paced cycle of cheap, disposable clothing (Thakker & Sun, 2023). This paradigm shift aligns closely with several SDGs, particularly Goal 12 (Responsible Consumption and Production), which advocates for sustainable practices across industries, and Goal 8 (Decent Work and Economic Growth), which emphasizes fair labor practices and economic growth that benefits all. The principles of slow fashion advocate for reduced consumption, transparent supply chains, and the support of local artisans, which contribute to a circular economy—minimizing waste and maximizing resource efficiency (Biancone et al., 2023). By integrating sustainability into fashion, this movement not only addresses environmental concerns but also promotes social equity, ensuring that workers in developing countries receive fair wages and work in safe conditions (Kabbara & Zucchella, 2023). The adoption of slow fashion practices empowers consumers to make informed choices, fostering a culture of responsibility and awareness that supports both ecological integrity and social justice (Thakker & Sun, 2023). As the fashion industry increasingly embraces these values, it plays a crucial role in advancing the SDGs and creating a more sustainable future for all.

However, despite the acknowledgment of sustainability, challenges remain as consumers often gravitate towards fast fashion, presenting obstacles to the adoption of ethical practices. The fashion industry is not only a major consumer of water but also a significant polluter, making sustainability a strategic imperative. Even when consumers express a willingness to purchase sustainably produced goods at a higher cost, their actual purchasing behavior often contradicts these claims. This disconnect raises questions about the effectiveness of sustainable practices in attracting customers and achieving a competitive edge. Thus, a comprehensive understanding of consumer behavior is vital for advancing sustainability goals, aligning with the broader objectives of the SDGs. Therefore, it makes sense to conduct a systematic review to gain a comprehensive understanding of this subject. With these suppositions in mind, the ultimate objective of this research is to conduct a bibliometric analysis of the slow and sustainable fashion literature by examining scientific works that have been published during the last 40 years (1983–2023).

More specifically, the research questions (RQ) that the endeavor aims to address are as follows:

RQ1. Who are the most contributing and collaborating authors, countries, and institutions in the literature on slow and sustainable fashion?

RQ2. What themes and patterns are present in the literature on slow and sustainable fashion?

RQ3. What conclusions can be drawn from the literature on possible directions for further studies on slow and sustainable fashion?

By following the development of the problem and identifying the most researched areas, as well as those that are still developing and may offer opportunities for future research, this bibliometric study seeks to narrow the research gap. From a theoretical perspective, by integrating existing research, detecting gaps in knowledge and inconsistencies, and creating new theoretical frameworks, comprehensive literature reviews significantly contribute to the theoretical, methodological, and thematic growth of numerous disciplines (Domingos et al., 2022; Jung & Jeong, 2020; Preuit & Yan, 2016). From a managerial viewpoint, this study contributes to the body of research on sustainability as a worldwide concern for organizations, governments, and individuals, giving readers a sense of the field's state of the art and organizing its findings (Štefko & Steffek, 2018). Finally, it pinpoints unexplored possibilities that might affect consumption patterns in a sustainable manner.

The article is structured as follows: [Section 2](#) provides a theoretical viewpoint on the research, followed by a narrative of the methodology in [Section 3](#), a discussion of the outcomes in [Section 4](#), and a final explanation of the directions for future study in [Section 5](#).

2. Theoretical perspectives

Slow fashion has emerged as a sustainable trend (Jung & Jeong, 2020). In the fashion business, slow fashion is a relatively new concept that was founded in 2008 and is based on sustainable ideals. When overproduction is not the goal, the goal is to minimize the exploitation of natural resources; apparel production moves slowly. Similarly, the consumer needs to own and wear clothing for a longer period of time, and early replacement of the item is not encouraged. Solino (Solino et al., 2020) highlight that slow fashion is an individual-centered trend that lessens the incentive for rapid and excessive consumption, while examining the motivation to shift societal attitudes and behaviors in the direction of a balance between social, environmental, and economic factors. Slow fashion is a stylish and sustainable movement that emphasizes purchasing fewer high-quality items. The usefulness of fast fashion is discussed in 'slow fashion.' The approach allows for financial success while simultaneously upholding the rights of workers and the environment, and provides exquisite and considerate apparel. The slow fashion system, which focuses on 'designing, producing, consuming, and living better,' is a new framework. Quantity is no longer the focus, and quality is. System changes are embraced slowly. This notion is maintained in the business sector since it is thought to be the best and is supported by individuals. To reestablish its connection to the laws of nature, slow fashion departs from the current power and speed structure. In other words, this is a fashion reinterpretation. A sense of accomplishment or social approval is associated with a consumer having access to recent fashion trends. Slow fashion shifts perceptions of rapid fashion by combining gradual production and consumption, avoiding the exploitation of people and environmental resources.

Slow fashion is not just a new way of thinking for the fast-fashion business; it is also a new way of producing goods. Customers' attitudes towards the detrimental environmental repercussions of fast fashion have little to no influence on their shopping decisions. In fact, while making clothing purchases, consumers are more concerned with fit and style than with environmental issues (Butler & Francis, 1997). As fashion and sustainability encompass a wide range of themes, researchers have observed that it is impractical or difficult for a single study to address all pertinent concerns and questions. Consequently, the goal of this study was to determine current research trends and milestones. By focusing on this particular area of interest, the current study offers insightful information while considering the larger context of fashion consumption and sustainability. For instance, an exhaustive survey of the literature can be used to find pertinent international articles on ethical fashion. The results of this type of evaluation provide useful information for future research and serve as a foundation for future studies.

[Table 1](#) outlines the foundational pillars of slow fashion, demonstrating how each contributes to broader sustainable development objectives. By adhering to these principles, the fashion industry can significantly mitigate its ecological footprint while promoting social equity and economic resilience.

Table 1. Initial pillars of slow fashion.

Pillar	Description	Contribution to SDGs
Quality over quantity	Focus on creating and purchasing fewer, high-quality garments that last longer.	Supports Goal 12 (responsible consumption)
Ethical production	Emphasizes fair labor practices, ensuring safe working conditions and fair wages for workers.	Supports Goal 8 (Decent work and economic growth)
Environmental Stewardship	Advocates for sustainable materials and practices that minimize ecological impact.	Supports Goal 12 (responsible production)
Transparency	Encourages brands to be open about their supply chains and sourcing practices.	Supports Goal 12 (sustainable practices)
Localism	Promotes support for local artisans and businesses, fostering community and cultural heritage.	Supports Goal 11 (sustainable cities and communities)
Circular economy	Focuses on recycling, upcycling, and reducing waste through responsible consumption practices.	Supports Goal 12 (responsible consumption)

3. Methodology

To map the development of the mindset and identify the critical components (i.e., nations, authors, and journals) in various research fields, this study used the bibliometric analysis method for the literature review (Gutiérrez-Salcedo et al., 2017). This systematic domain-based review examines a large body of published research to identify knowledge gaps and potential directions for future studies, as well as to emphasize statistical findings and identify trends. A systematic literature review is a useful tool for ‘identifying, evaluating, and synthesizing all the empirical evidence that satisfies pre-specified eligibility criteria to answer a given research question,’ but it can be difficult to manually search through and classify the vast amount of existing literature. The current systematic literature review includes bibliometric visualization tools to improve the review and analysis processes. The investigation was organized (Figure 1) in the following steps using protocols from the existing literature (Capobianco-Uriarte et al., 2019; Paul & Criado, 2020).

Choose a database, (2) establish search parameters, and (3) analyze data.

3.1. Data collection

The first step for the researchers was to choose the best database. The most well-known academic database, Scopus, is one that researchers use to learn more about the state of slow fashion today. Scopus was used for two reasons: first, it includes publications that meet rigorous standards for indexing, and second, it offers comprehensive bibliometric information for the publications it indexes. Furthermore, investigations aimed at compiling a substantial corpus for review can benefit greatly from Scopus, a scientific database often recommended for bibliometric assessments (Donthu et al., 2021; Paul & Criado, 2020). ‘Web of Science’s coverage is less than that of Scopus, making Scopus a more comprehensive yet excellent source of bibliometric data (Paul et al., 2022).’ Selecting relevant search terms is a significant decision that is validated by subject matter experts and based on a review of the literature. The title, abstract, and keywords have been added to the expanded search parameters. In the present study all the factors has been taken from literature review. The data were gathered using the most pertinent terms, such as ‘**slow fashion, ethical fashion, sustainable fashion, eco-friendly fashion, and vegan fashion.**’ For the search approach, all terms were joined using the Boolean operator ‘or.’ Subsequently, a previously specified search string was employed to obtain materials from the Scopus database. Only the keywords and title abstracts were searched for key terms. A total of 1256 research documents pertaining to the years 1983–2023 were identified using the search method. Other exclusion criteria were also applied The criteria utilized in this step of the article selection process involved concealing the identity

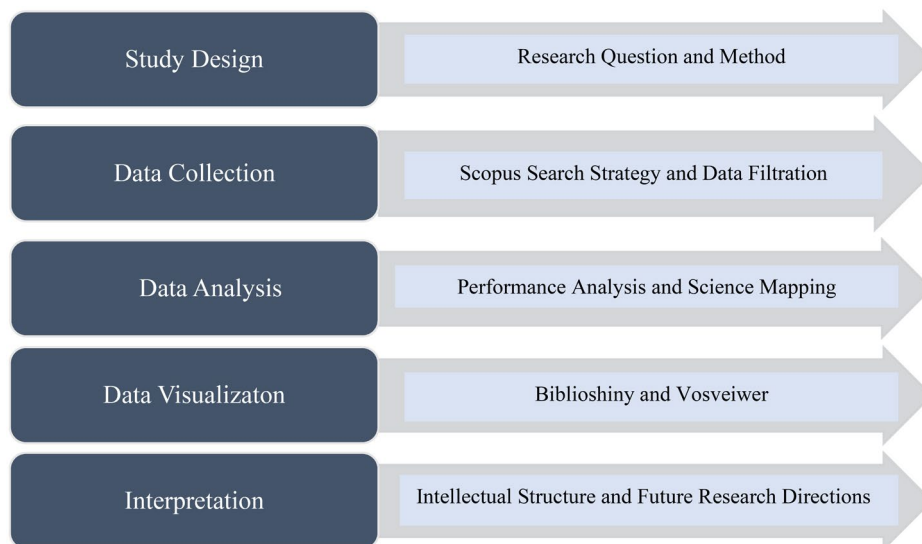


Figure 1. Methodological framework for the bibliometric analysis.

Source: Researchers's own work.

of the authors and journal names to adhere to the guidelines of Lundberg et al. Because of the online selection process, the sample was limited to fields and was only available in English. After data curation, 343 articles were extracted.

3.2. Data analysis

This approach includes ‘science mapping’ and ‘performance analyses.’ In terms of publications, the performance analysis examines authors, articles, sources, countries, and institutions. In contrast, science mapping uses bibliometric techniques to identify patterns/collaborations/networking in scientific research. The following information was thoroughly evaluated for each of these major categories: (1) summary statistics, (2) annual scientific production with citations, (3) impactful journals, (4) most global and locally cited sources, (5) important authors, influential affiliation, and most-impacting nations, (6) bibliographic coupling, (7) thematic analysis, (8) co-occurrence of keywords, (9) historical and contemporary movements of keywords, and (10) future research directions. Both review papers provide evidence in favor of notionally defined categories.

The filtration process for selecting articles on slow and sustainable fashion was implemented to ensure a comprehensive and relevant study focused on high-quality research as shown in the [Table 2](#). The search string, which included specific keywords like ‘slow fashion,’ ‘ethical fashion,’ and ‘sustainable fashion,’ was designed to capture a wide range of pertinent literature while filtering out unrelated studies. By allowing all types of articles, the selection aimed to gather diverse perspectives and methodologies, enriching the bibliometric analysis. Limiting the publication period to 1999–2023 helped focus on the most current research trends and capture the evolution of these concepts over time. In terms of subject areas, including disciplines such as business, social sciences, and environmental science provided a holistic understanding of slow fashion from various angles, while excluding unrelated subjects maintained the relevance of the literature. Not imposing restrictions on document types ensured that all forms of scholarly work—such as articles, reviews, and case studies—were considered, broadening the analysis’s scope. Additionally, focusing solely on English publications facilitated consistency in analysis, given that English is widely used in academic discourse. Ultimately, arriving at a manageable number of 343 articles allowed for in-depth examination while ensuring that the study remained focused and feasible. This careful selection process aimed to ground the analysis of slow and sustainable fashion in relevant, high-quality research, facilitating meaningful insights into the field.

3.3. Data visualization

Many software programs are available for bibliometric analysis, including Bibexcel (Fahimnia et al., 2015), Network Workbench Tool, Biblioshiny, Vosviewer (Cavaggioli & Ughetto, 2019), INSPIRE, Histcite, VantagePoint, Pajek (Persson et al., 2009), CoPalRed, CiteSpace II (Li et al., 2018), Gephi (Xu et al., 2018), Bibexcel (Persson et al., 2009), and PePalRed. Bibliometrix and Vosviewer were used to analyze the bibliometric data in this study. Graphs were created in Microsoft Excel using the Biblioshiny output data. The documents were then mostly imported into virtual Biblioshiny software, which was created as an

Table 2. Material data collection.

Category	Criteria	Numeral of Filtered Articles
Search string	Title-Abs-Key ‘slow fashion’ OR ‘ethical fashion’ OR ‘eco-friendly fashion’ OR ‘vegan fashion’ AND ‘Sustainable Fashion’	1256
Access	All types	–
Period	Including articles between 1999 to 2023	–
Subject area	Business, management, economics, social sciences, engineering, psychology, environmental science, material science, energy, and decision sciences: all these subject areas were included, but other subjects were excluded.	(906)
Document type	No Restrictions	–
Language of publication	English Only	(7)
Final number of articles for further bibliometric study		343

Source: Author’s work.

interface for bibliometrics. 'It provides a broad range of statistical techniques and visualizations (it excels in offering dynamic visualizations that show change over time) that can be used for performance analysis or to determine the conceptual, intellectual, or social structure of the field, in contrast to most other bibliometric tools.' Furthermore, VosViewer, a visualization program that is widely used, was used.

4. Results analysis

4.1. Performance analysis

It examines the contribution of research constituents in a given field (authors, institutions, countries, and journals). The conclusions from the bibliometric analysis of 343 slow and sustainable fashion publications published between 1983 and 2023 are presented in this chapter. An annotated overview of the analysis results is shown in Figure 2. The average number of citations for papers published during this time frame in the Scopus database was 18.54. The increased average number of citations per document suggests that the body of research on sustainable fashion is rapidly expanding. The findings also revealed that 2918 different authors contributed to the topic of slow and sustainable fashion throughout this time. A total of were 276 documents obtained from a single author. There are 2.77 co-authors on average for each document. This shows that a significant number of research papers are conducted in partnership with other authors in a slow and sustainable fashion. However, a substantial number of single-author studies were considered.

4.2. Annual scientific production

Initially, we examined the history of the scientific output. The publication interest over the considered period does not show a clear trend line, as Figure 3 illustrates. In 2000 and 2001, only one publication was released annually; however, in 2002, that number increased to three, and in 2003, it dropped to just two. In 2004, there were six publications; in 2005, there was another decline; and in 2006, there were 12. This oscillatory pattern persisted until 2012. Subsequently, there was an ongoing rising trend from 2013 to 2023, which accounted for almost 90% of all publications in the database. Comparably, the document earned close to 50 citations in total in 2000, dropped to 46 in 2001, and increased to 48 in 2002. Until 284 in 2004, it displayed a growing tendency; however, in 2005, it declined once more. The variation persisted until 2012, when the number of document citations showed a steady increase. Publications received over 3000 citations, with the highest possible number in 2019

Bradford's Law, one of the core ideas of bibliometrics, makes it possible to determine the main journals for a certain topic.

Bradford's law is therefore frequently used in bibliometrics to evaluate journal production. Furthermore, the information shows that 1256 research articles were published in 698 publications. More precisely, 417 papers came from the first group of 35 journals, 425 articles from the second group of 247 journals, and



Figure 2. Summary statistics.
Source: R Studio.

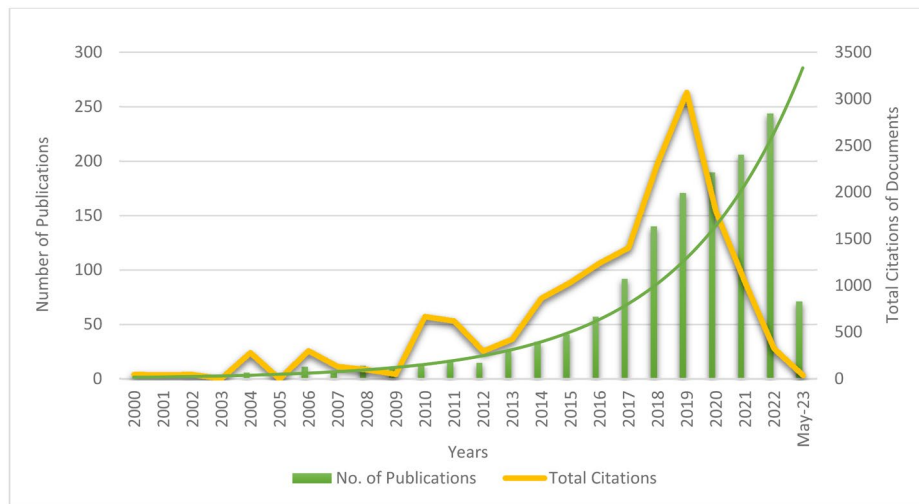


Figure 3. Annual scientific production with citations.

Source: R Studio.

Table 3. Zone-wise distribution of journals and publications.

Zone	Number of journals	(%) of Journals	Number of articles	(%) of Articles
Zone 1	35	2.00%	417	33.20%
Zone 2	247	34.48%	425	33.83%
Zone 3	414	59.48%	414	32.96%
Total	696	100.00	1256	100.00

Note: Zone 1 consists of leading journals in any discipline; these publications push the knowledge boundaries. Zone 2 journals can be thought of as publications that follow Zone 1 journals since they are published in a few different connected fields. Compared to the preceding two zones, Zone 3 journals are less field-specific.

414 articles from the third group of 414 journals (see Table 3). Bradford's law states that the theoretical number of articles in each zone should be $1256/3=418$, or 33.28% of the total. Table 3 shows that the number of articles in each of the three zones is approximately equal. However, the manner in which items are distributed across all zones is inconsistent. Bradford's distribution did not match that of the dataset. It can be inferred that less prestigious journals that publish articles specifically on this topic are located in Zone 1. However, as we proceeded from Zone 2 to Zone 3, the number of articles remained constant; instead, the number of journals in these zones continued to increase. These periodicals publish average-quality articles and do not dedicate much time to this topic. Compared with the papers found in the subsequent zones, those found in the core zone (Zone 1) are significantly more prolific. A few well-known journals found in Zone 1 (core journals) include 'Sustainability Switzerland, Journal of Fashion Market, Fashion Practice, International Journal of Fashion Design, Technology, and Education, and Journal of Global Fashion Marketing.

Table 4 lists the journals with the highest contributions. It is depicted in Figure 4 that 'The source that publishes the greatest number of research articles and is most frequently chosen for research using slow and sustainable fashion is Sustainability Switzerland (TP = 90). The Journal of Global Fashion Marketing (TP = 17) and Journal of Fashion Marketing and Management (TP = 40)' come next. Furthermore, Table 3 shows that the story is similar, based on the overall number of citations. Among the journals, Sustainability Switzerland (TC = 1344) had the greatest influence. The Journal of Global Marketing Management (TC = 325) and the Journal of Fashion Marketing and Management (TC = 1571) come next. Switzerland's sustainability had the highest h-index at 20. 'The largest value of h indicates that a specific journal has published at least h articles, each of which has been cited at least h times, and is denoted as the h-index, which is a journal-level metric that evaluates both the productivity and citation impact of publications linked with the journal'. The production of the top five sources of sustainable and slow fashion research between 1983 and 2023 is shown in Figure 5

The most prolific authors in this field of study, represented by 13 research articles, are shown in Figure 6. The author who contributes the most is Choi-T-M. He is a doctorate and currently working at the University

Table 4. Most impactful journals.

Element	h_index	g_index	m_index	TC	NP	PY_start
Sustainability (Switzerland)	20	35	1.818	1344	90	2014
Journal of Fashion Marketing and Management	18	39	0.947	1571	40	2006
Journal of Global Fashion Marketing	10	17	1.111	325	17	2016
International Journal of Consumer Studies	9	10	0.75	856	10	2013
Fashion Practice	8	14	0.8	220	27	2015
Journal of Cleaner Production	8	11	0.296	395	11	1998
Fashion Theory - Journal of Dress Body and Culture	7	14	0.412	433	14	2008
International Journal of Fashion Design, Technology and Education	7	14	0.5	198	18	2011
International Journal of Production Economics	7	8	0.412	860	8	2008
Journal of Retailing and Consumer Services	7	7	0.368	396	7	2006

Source: R Studio.

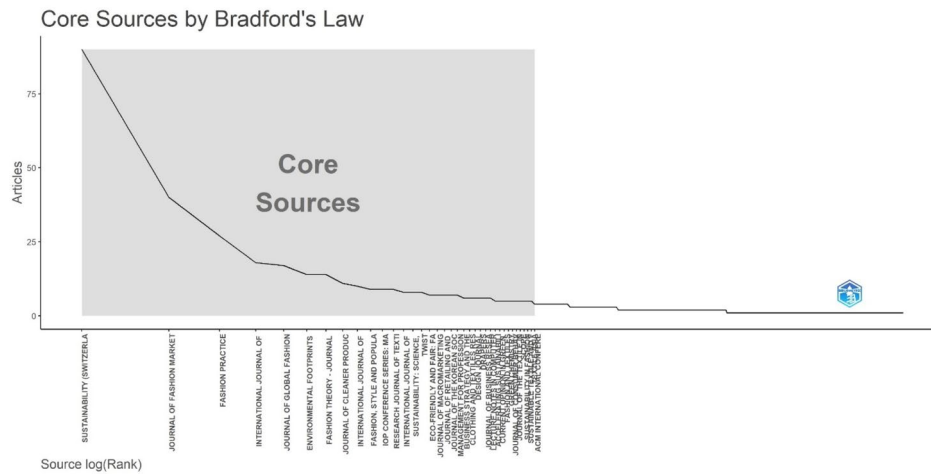


Figure 4. Bradford's law.
Source: R Studio.

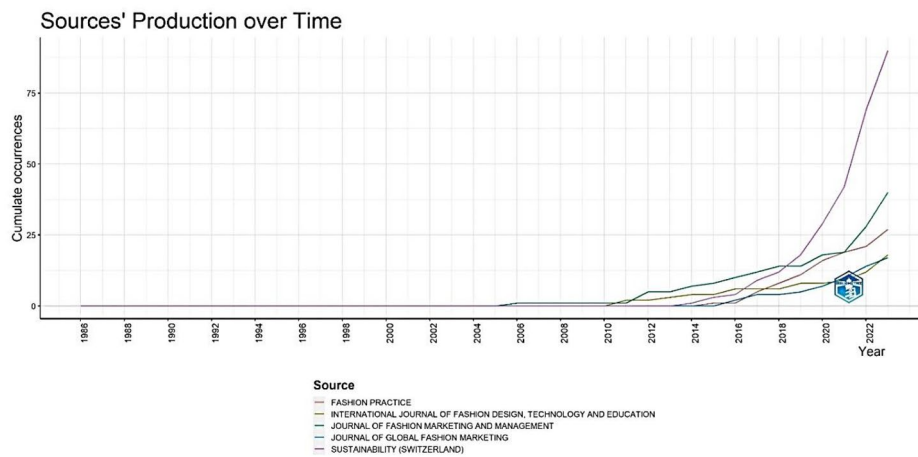


Figure 5. Sources' production over time.
Source: R Studio.

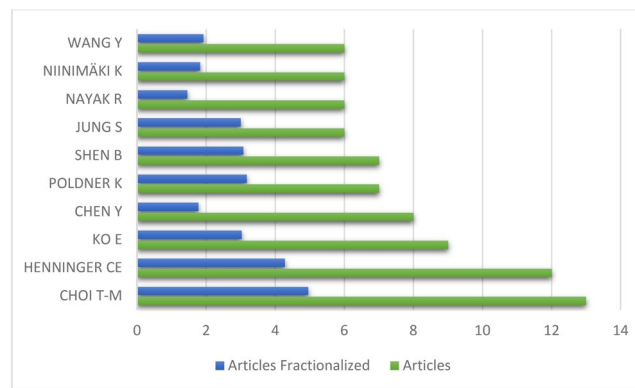


Figure 6. Most prolific authors.

Source: R-Studio.

Table 5. Most prolific authors.

Authors	Articles	Articles fractionalized
Choi T-M	13	4.95
Henninger CE	12	4.28
Ko E	9	3.03
Chen Y	8	1.78
Poldner K	7	3.17
Shen B	7	3.08
Jung S	6	3
Nayak R	6	1.45
Niinimäki K	6	1.83
Wang Y	6	1.92

Source: R-Studio.

of Liverpool, England. He had publications related to the use of technologies for SCM, (ii) sustainable SC operations, (iii) OM under risk and pandemics. Henninger CE is the author of 12 research articles on the use of slow and sustainable fashion. **Claudia E. Henninger** is a Reader in Fashion Marketing & Management, interested in sustainability and the circular economy. She has been published in internationally leading journals (e.g. EJM, International Journal of Management Review). Claudia is an Executive Member of the Sustainable Fashion Consumption Network and the Chair of the Academy of Marketing's SIG Sustainability. KOE provided nine scientific publications. Fractional values of 4.95, 4.28, and 3.03, respectively. The results are presented in Table 5

Table 6 illustrates that the article authored by HUNT SD, 1986, J MACROMARK (TC= 176), is the most globally cited article. This is followed by 'HU B 2010, ADV MATER' (TC= 1469) and 'DE SARKAR S, 2014, ADV SYNTH CATAL' (TC= 643).

Table 7 illustrates that the article authored by 'JOERGENS, 2006, J FASH MARK MANAGE' is the most locally cited article with 97 local citations. This is followed by Clark, 2008, FASH THEORY - J DRESS BODY CULT' (TC= 94) and 'POOKULANGARA S, 2013, J RETAIL CONSUM SERV' (TC= 82).

Tables 6 and 7 displayed detailing citation metrics for research on slow and sustainable fashion are essential for assessing the impact of this research within the academic community. They provide quantitative measures—such as total citations, citations per year, and normalized total citations—that help identify seminal works shaping the discourse in the field. Common themes emerge across these studies, including a strong emphasis on sustainability, critiques of fast fashion practices, and exploration of consumer behavior towards responsible choices. These themes are addressed through various approaches, such as empirical evidence, theoretical frameworks, and case studies, with some research also discussing policy implications to facilitate a transition toward sustainable practices. Overall, these tables not only quantify individual study impacts but also reveal key trends and emerging areas for further exploration in sustainable fashion, highlighting the evolving academic discourse on this critical topic.

The scholarly work on sustainable and slow fashion is scattered throughout 73 nations. The top 10 most cited countries that make contributions to publications about sustainable and slow fashion are depicted in Figure 7. With more than 2500TC, the United States led the pack, followed by the United

Table 6. Top global author-cited documents.

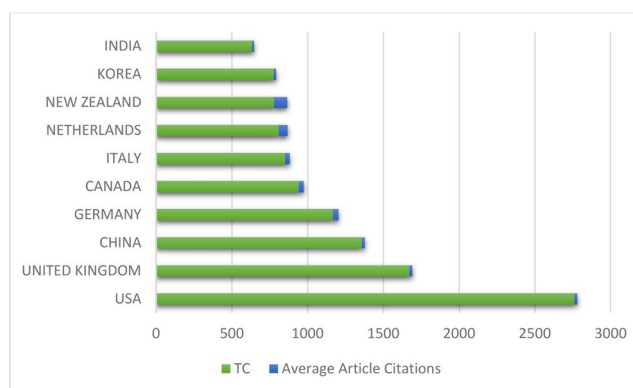
Paper	DOI	Total Citations	TC per Year	Normalized TC
HUNT SD, 1986, J MACROMARK (Hunt & Vitell, 1986)	10.1177/027614678600600103	1676	42.97	1.00
Hu et al., 2010, ADV MATER (Hu et al., 2010)	10.1002/adma.200902812	1469	97.93	14.93
DE SARKAR S, 2014, ADV SYNTH CATAL (Sarkar, 2014)	10.1002/adsc.201400110	643	58.45	15.54
DE BRITO MP, 2008, INT J PROD ECON (de Brito et al., 2008)	10.1016/j.ijpe.2007.06.012	398	23.41	12.41
HALL CM, 2001, OCEAN COAST MANAGE (Hall, 2001)	10.1016/S0964-5691(01)00071-0	396	16.50	6.43
NIINIMÄKI K, 2020, NAT REV EARTH ENVIRON (Niinimäki et al., 2020)	10.1038/s43017-020-0039-9	389	77.80	20.13
GALLUZZI L, 2009, NAT REV NEUROSCI (Galluzzi et al., 2009)	10.1038/nrn2665	340	21.25	10.12
VAGNOZZI R, 2010, BRAIN (Vagnozzi et al., 2010)	10.1093/brain/awq200	334	22.27	3.39
JOERGENS, 2006, J FASH MARK MANAGE (Joergens, 2006)	10.1108/13612020610679321	293	15.42	5.28
TODESCHINI BV, 2017, BUS HORIZ (Todeschini et al., 2020)	10.1016/j.bushor.2017.07.003	269	33.63	13.42

Source: R Studio.

Table 7. Top local author-cited documents.

Document	DOI	Year	Local citations	Global citations	LC/GC ratio (%)
JOERGENS, 2006, J FASH MARK MANAGE (Joergens, 2006)	10.1108/13612020610679321	2006	97	293	33.11
Clark, 2008, FASH THEORY - J DRESS BODY CULT (Clark, 2008)	10.2752/175174108x346922	2008	94	193	48.70
POOKULANGARA S, 2013, J RETAIL CONSUM SERV (Pookulangara & Shephard, 2013)	10.1016/j.jretconser.2012.12.002	2013	82	177	46.33
MCNEILL L, 2015, INT J CONSUM STUD (McNeill & Moore, 2015)	10.1111/ijcs.12169	2015	74	243	30.45
HENNINGER CE, 2016, J FASH MARK MANAGE (Henninger et al., 2016)	10.1108/JFMM-07-2015-0052	2016	73	213	34.27
LUNDBLAD L, 2016, J CONSUM BEHAV (Lundblad & Davies, 2016)	10.1002/cb.1559	2016	54	196	27.55
JUNG S, 2014, INT J CONSUM STUD(S. Jung & Jin, 2014)	10.1111/ijcs.12127	2014	52	116	44.83
SHEN B, 2012, J FASH MARK MANAGE (Shen et al., 2012)	10.1108/13612021211222842	2012	47	133	35.34
BLY S, 2015, INT J CONSUM STUD (Bly et al., 2015)	10.1111/ijcs.12159	2015	42	118	35.59
JUNG S, 2016, SUSTAINABILITY(S. Jung & Jin, 2016)	10.3390/su8060540	2016	38	74	51.35

Source: R studio.

**Figure 7.** Most cited countries.

Source: MS Excel.

Kingdom (1671) and China (1357). Similarly, the nation's production over time is shown in Figure 8 with the highest production by the USA country, followed by the UK and China. The USA and UK lead in published articles on slow and sustainable fashion due to several key factors. Both countries host prominent research institutions dedicated to fashion studies and sustainability, fostering innovative research. Growing consumer awareness and advocacy for environmental issues have heightened interest in ethical practices within the fashion industry. Additionally, the influential fashion markets in these regions face pressure to adopt sustainable practices, driving research initiatives. Availability of funding for sustainability research and interdisciplinary collaboration further enhance scholarly output, resulting in a significant volume of publications in these areas.

Sustainable and Slow Fashion research was published with the participation of around 180 organizations worldwide. From 1983 to 2023, Figure 9 illustrates the 10 most productive organizations in terms of the total number of publications. Hong Kong Polytechnic University took the first place (34 publications), headed by Donghja University (27 publications) and Yonsei University (24 publications). These organizations contributed significantly more to sustainable and slow-fashion research than the others. This statistic provides useful insights into research tendencies at the organizational level.

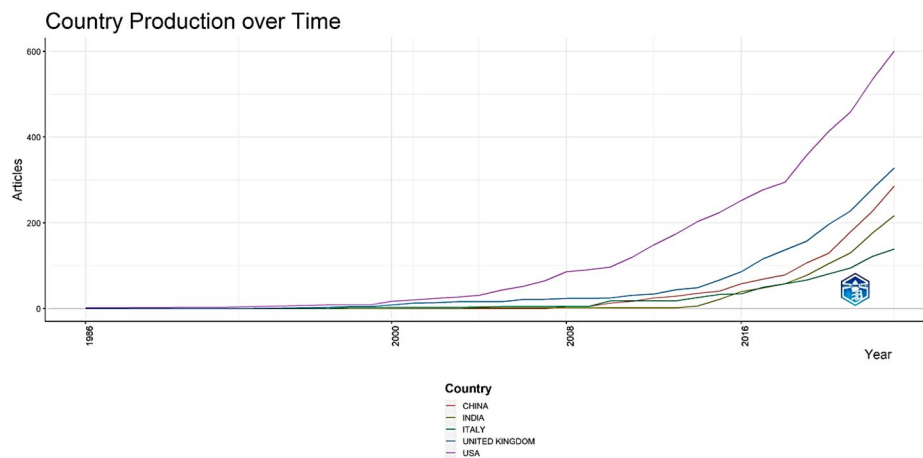


Figure 8. Nation's production over time.

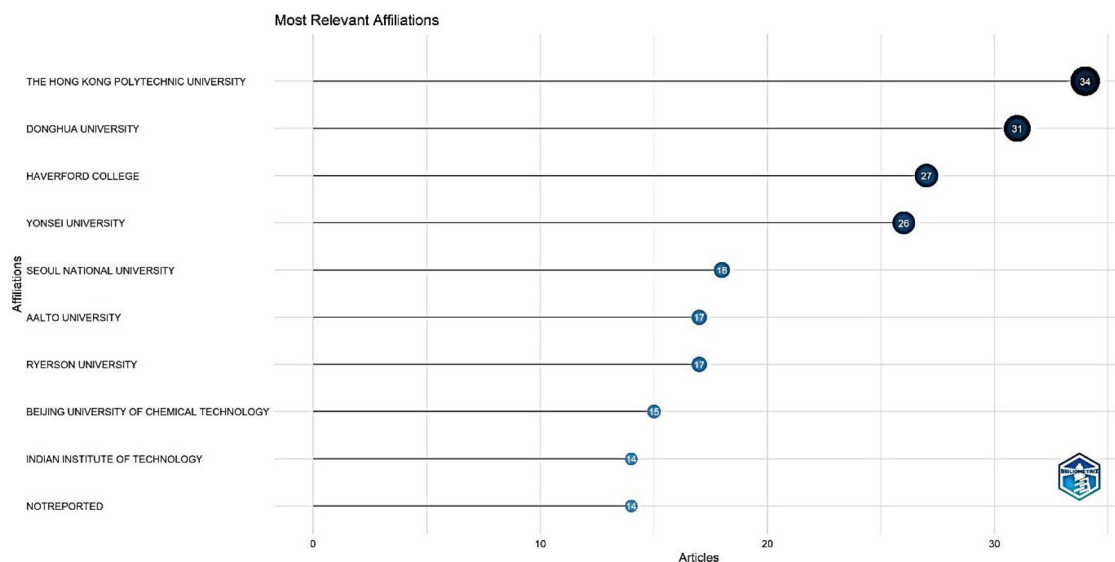


Figure 9. Most fruitful institutions. Source: R- Studio.

4.3. Science mapping

It shows the networking or collaborations between research constituents (for instance, authors, institutions, and countries, as well as the co-occurrence of keywords).

Nearly 97 countries met this criterion, and 36 countries met the bar of possessing a minimum of three sustainable and slow fashion research projects and are associated in a map based on network data. **Figure 10** depicts a network map with a large number of interconnected elements involving 38 countries in the apparel waste field. It depicts partnerships between authors from various countries in particular. Node size determines the power of the linkages. Typically, a country with a larger node represents the best collaboration and cooperation among researchers from various countries working on apparel waste. According to the study, the USA has the largest node size, with 29 (total link strength), followed by the UK (9), and China (8). This indicates that the USA, the UK, and China have a close working partnership in the field of sustainable and slow fashion research. Furthermore, even though they are active in separate clusters, the USA, UK, and China display closeness. As a result, these countries do not need to be grouped into the same cluster for collaboration.

Figure 11 shows the bibliographic coupling of these documents. Bibliographic coupling is a bibliometric technique that measures the similarity between two papers by assessing the number of references they share. This aids in the understanding of the present or periodic evolution of topics in the field of study. The stronger their bonds, the more information they exchange. A bibliographic coupling map is shown in **Figure 11**, with two clusters denoted by different colors, 225 links, and a total link strength of 324. This map covers 104 publications that have received at least ten citations. Node represents the name of the author to whom the publication belongs. 'A Journal Theory of Marketing Ethics' is the most highly cited article published in the Journal of Macromarketing. This high citation count implies that it has shaped discussions and research directions within the topic of marketing ethics, thereby influencing other authors to reference it as they explore related themes.

The conceptual structure of the literature was revealed through thematic mapping (Kumar et al., 2022) which aimed to identify the main research themes in sustainable and slow fashion. As illustrated in

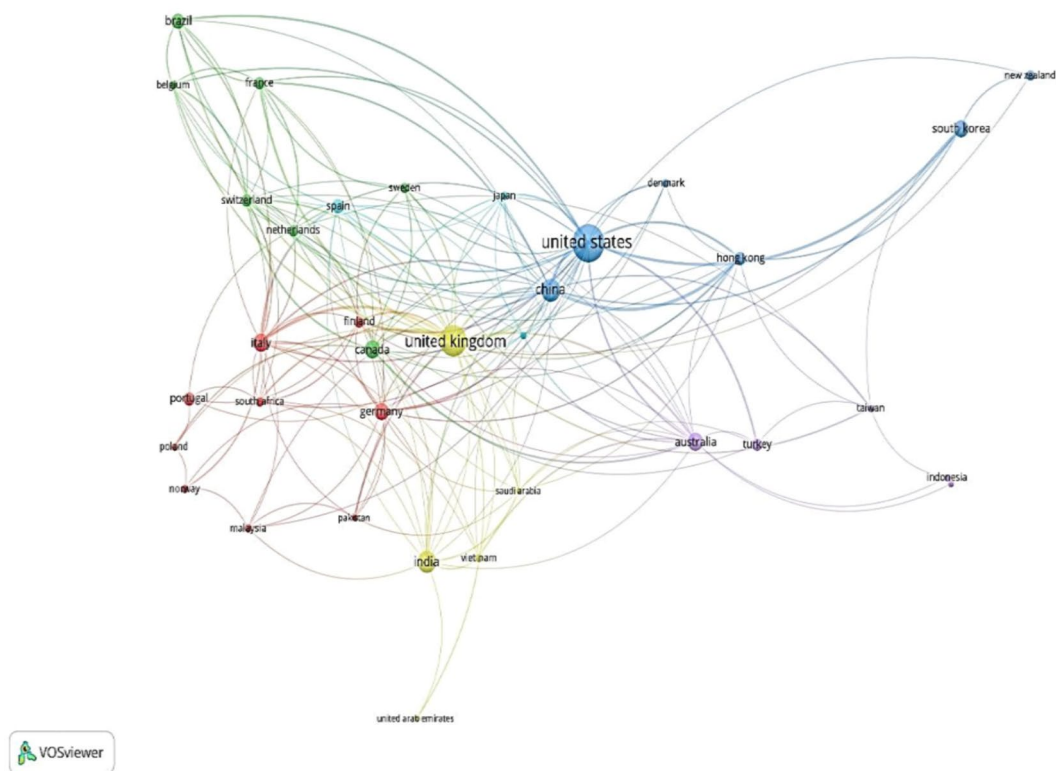


Figure 10. Co-authorship based on countries.
Source: VosVeiver.

Figure 12, a graph of a bi-dimensional matrix whose axes are functions of the theme network's density and centrality was created using the conceptual network and the author's

A clustering method applied to the term network allowed us to highlight different themes within a given topic. According to Cobo et al. (2018), there are numerous clusters or themes represented on this strategic or thematic map, according to Cobo et al. (2018). Centrality indicates a theme's importance within the overall research area, whereas density indicates the theme's development. The author's keywords and word count, which is 250, are the parameters for the thematic map of the field. The name of each bubble in this instance is the term with the highest occurrence value within that cluster, which corresponds to a network cluster. The present study used theme maps to generate charts including themes and sub-themes, which are then categorized into four quadrants using the conceptual framework included in the 'biblioshiny' research package (J. Paul & Criado, 2020). The upper-right quadrant contains the motor themes that are the most advanced and significant in a specific research domain. A niche theme is well-developed but less significant within a particular research environment, known as the upper-left quadrant. The key themes within the designated research context are displayed in the lower-right quadrant. Emerging or declining themes in the lower-left quadrant require further examination to fully comprehend (Aggarwal, 2023). The analysis clearly shows that the majority of research clusters in this domain belong to the lower-right quadrant, which includes fundamental themes with

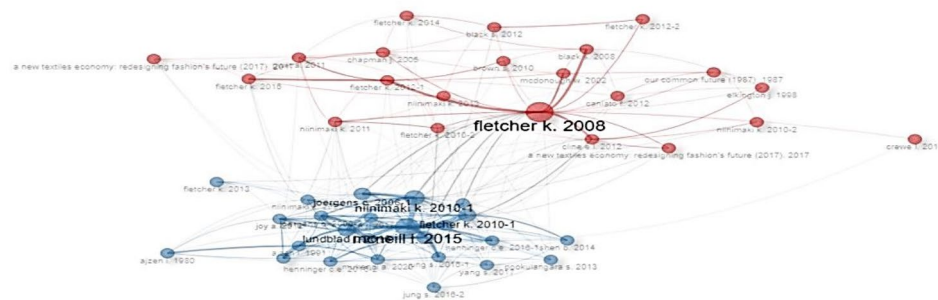


Figure 11. Bibliographic coupling.
Source: Vos Viewer.
Source: R- Studio.

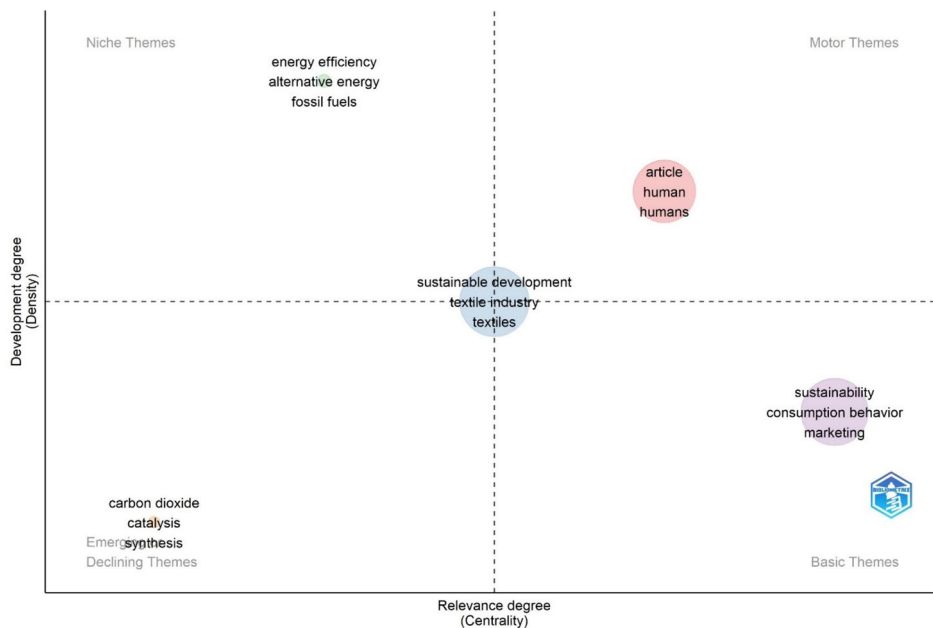


Figure 12. Thematic map analysis.
Source: R- Studio.

significant relevance but less advanced research areas, such as sustainability, consumption behavior, and marketing. The upper-left quadrant of niche themes consists of highly established clusters that are less relevant to the current study area. These clusters included energy efficiency, alternative efficiency, and fossil fuels. Carbon dioxide synthesis and catalysis are in the lower left quadrant, which can be classified as an emerging concept. Thorough examination is necessary to comprehend its emergence and dynamics within the other quadrants. The motor themes located in the upper-right quadrant, which encompass study areas including articles, humans, and humans, had both high density and high centrality. These themes can enhance future research. Terms such as sustainable development have high centrality, but medium density. Similarly, the term textile industry has medium density but low centrality.

In the past 40 years, 7101 keywords linked to sustainable and slow fashion have been discovered. The minimum number of keywords was set to nine in this study, resulting in 94 keywords that met the criteria. This was done to identify the distribution and interconnections between the main areas of research in a sustainable and slow manner. Figure 13 shows that the keywords were clustered into five clusters based on their similarity in the research field.

Cluster 1 was dominated by the theme of sustainability, which had the greatest number of linkages (82), the highest overall link strength (713), and was the most prominent theme. This suggests a substantial correlation between sustainability and other terms in the same cluster, including environmental sustainability, environmental effects, fashion industry, and corporate social responsibility. With a total connection strength of 44, emerging nations stand out in Cluster 2, highlighting the interconnectedness of sustainable development and the need for sustainable practices in developing countries, such as India. Clusters 3 and 4 highlight the new keywords ethical fashion, consumer behavior, sustainable fashion, and the clothing industry, reflecting consumer awareness of sustainable fashion products. In cluster 5, collaboration, circular economy, innovation, and sustainable practices, these keywords stand out and depict the collaboration of innovative sustainable practices in a circular economy to make the economy prosperous.

4.4. Historic advances and contemporary movements of keywords in slow and sustainable fashion

The analysis of historical developments and contemporary movements in keywords related to slow and sustainable fashion reveals significant trends over five distinct periods, showcasing the evolution of

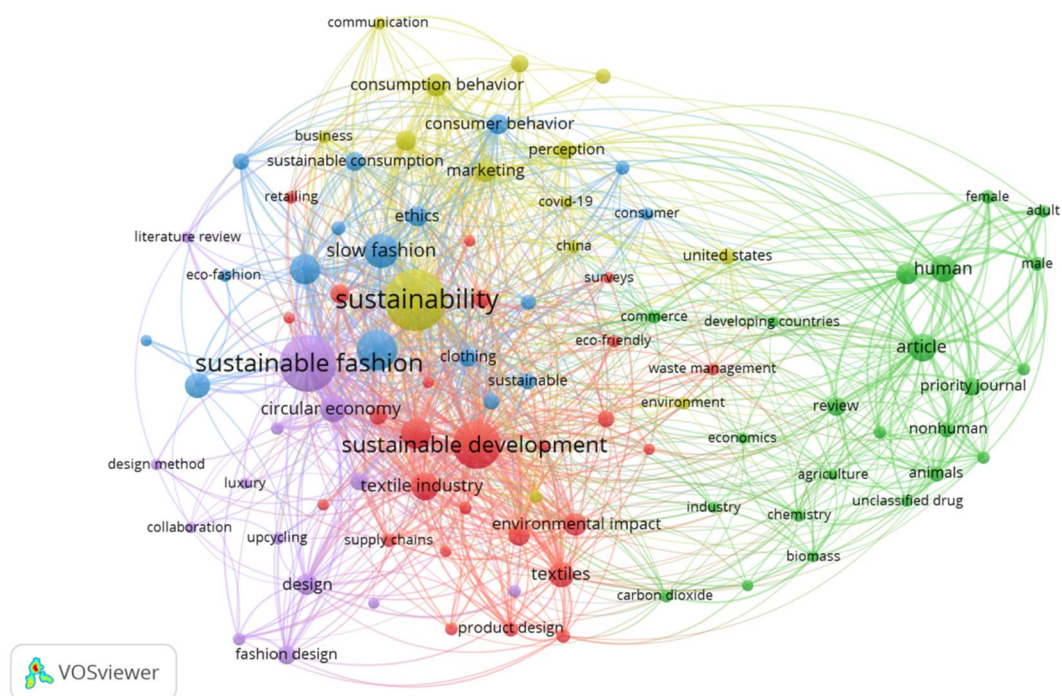


Figure 13. Co-occurrence of keywords.
Source: Vos viewer.

scholarly focus in this field. The study employs density visualization to illustrate keyword occurrences from 1983 to 2023 as shown in Figure 14 and Table 8, offering insights into how research themes have shifted and matured.

1. 1983-2000: In this initial period, 236 keywords met the minimum occurrence threshold of one. Key themes such as biodiversity, cost-benefit analysis, and environmental pollution emerged, indicating an early awareness of ecological impacts. However, terms like 'rats,' 'males,' and 'animals' faded from relevance, suggesting a narrowing focus toward more impactful environmental concerns. The term 'non-human' remained stable, reflecting a consistent acknowledgment of non-human entities in environmental discourse.

2. 2001-2007: This phase saw an increase in keyword occurrences, with 358 meeting the threshold. Notably, biodiversity and environmental pollution continued to rise in prominence. New keywords like 'sustainable development,' 'sustainable environmental policy,' 'fashion,' and 'marketing' appeared, marking a shift towards integrating sustainability into fashion discourse and policy discussions.

3. 2008-2012: With 178 keywords exceeding a minimum of two occurrences, this period highlighted ongoing interest in sustainability, biodiversity, and fashion. New terms such as 'investment,' 'alternate

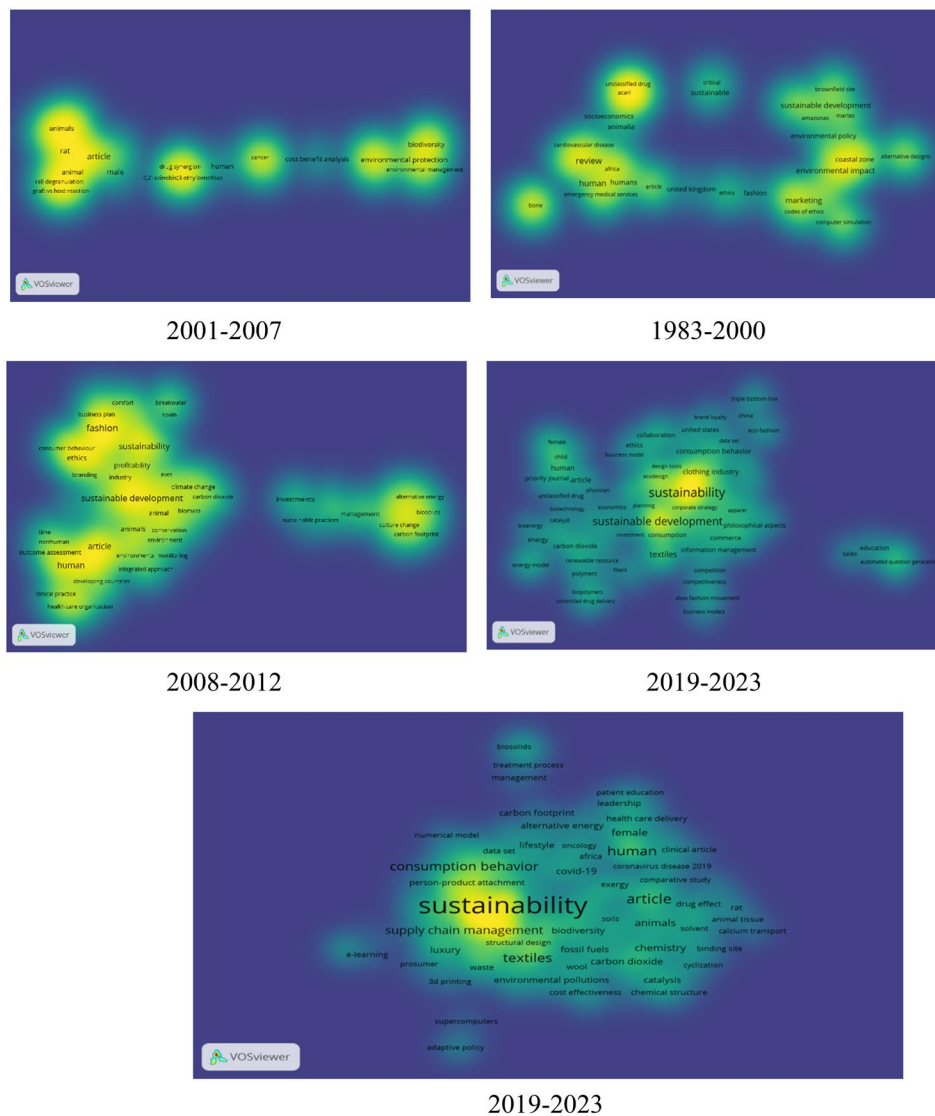


Figure 14. Historic advances and contemporary movements of keywords in slow and sustainable fashion. Source: Vos viewer.

Table 8. Contemporary movements of keywords.

Keywords	Freq	Keywords	Freq	Keywords	Freq	Keywords	Freq	Keywords	Freq
Article	5	Sustainable development	7	Fashion	22	Sustainability	71	Sustainability	269
Priority journal	5	Review	7	Sustainable development	19	Sustainable development	49	Sustainable development	163
Non-human	4	Marketing	7	Sustainability	14	Textile	17	Textiles	47
Rat	4	Environmental Impact	7	Article	14	Ethical Fashion	11	Consumption behavior	36
Male	4	Human	7	Human	13	Clothing industry	10	Catalysis	8
Animal	3	Sustainable	6	Ethics	9	Consumption behavior	9	Carbon footprint	7
Controlled Study	3	UK	6	Investments	5	Sustainable design	6	Energy utilization	7
Biodiversity	3	Fashion	6	Alternative energy	2	Renewable Resources	3	Environmental pollution	6
Cost-benefit analysis	2	Environment policy	6	Biodiversity	2	Slow fashion movement	3	3d printing	3
Environmental protection	2	Air pollution	3	Climate change	2	Energy model	3		
		Computer simulation	3	Health care organizations	2				
		Sustainable Acari	3						

Source: Researchers work.

energy,' 'climate change,' 'ethics,' and 'health care organizations' emerged, indicating a broader interdisciplinary approach that recognized the interconnectedness of fashion with global environmental and ethical issues.

4. 2013–2018: This period marked a surge in engagement with specific concepts, with 248 keywords meeting the minimum threshold. Keywords like 'textile and clothing industry,' 'ethical fashion,' 'slow fashion movement,' and 'sustainable design' became prominent, reflecting growing environmental consciousness and the rise of ethical considerations in fashion. Sustainability and sustainable development continued their upward trajectory, underlining their foundational role in the discourse.

5. 2019–2023: The most recent period demonstrated a remarkable increase, with 1399 keywords meeting the minimum threshold of two occurrences. This surge indicates a significant scholarly focus on sustainability, sustainable development, textiles, and environmental pollution. The high occurrence of these keywords suggests that researchers are increasingly addressing pressing environmental concerns and emphasizing the need for sustainable practices within the fashion industry.

Overall, the bibliometric analysis illustrates a clear trajectory from a nascent awareness of environmental issues in the early years to a robust and interdisciplinary engagement with sustainability in recent times. Each period not only reflects evolving academic interests but also highlights the growing importance of sustainable practices and ethical considerations in fashion, demonstrating a significant shift towards integrating environmental consciousness into the industry. This comprehensive overview provides valuable insights for researchers and practitioners looking to understand the dynamics of slow and sustainable fashion and its relevance in contemporary discourse.

5. Discussion and conclusion

5.1. Discussion

5.1.1. General trends in the slow and sustainable fashion literature

After appropriately outlining the summary statistics, we quickly overlooked the findings. First, our bibliometric analysis did not require careful collection of sample data, as other bibliometric analyses have been conducted. Nonetheless, to create a viable research path for the topic, we turned to comparatively simple and quantifiable primary data gathering as well as the use of appropriate analytical methodologies to assess the amount of research that has been conducted in a slow and sustainable manner. In the discussion that follows, we look at a few selected sample results, outlining some insights that scholars, organizations, and politicians might use. This study examines the body of research on sustainable and slow fashion found in the Scopus database. To determine the present

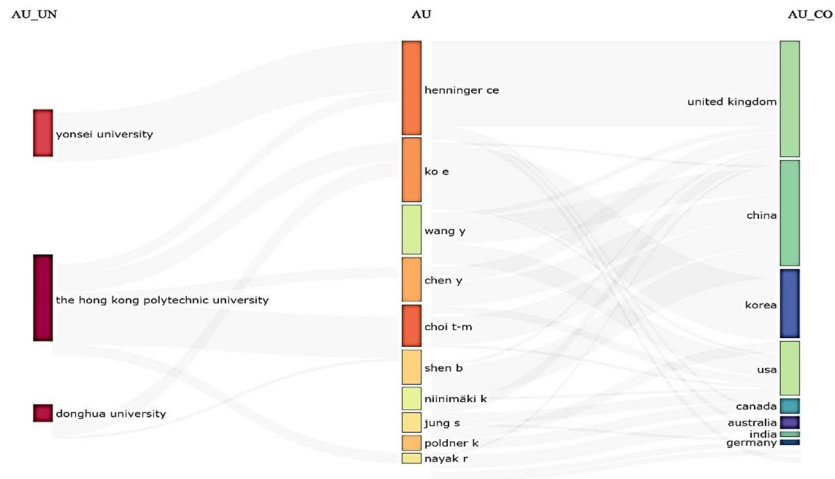
state of research in this field, we employed Biblioshiny and Vosveiwier for Bibliometrix analysis, looking at the 'contributions of journals, authors, keywords, Keyword Plus, highly cited papers, institutions, and nations.' Relevance, citations, and publications indicate that this research area is becoming increasingly popular. The results also demonstrate that leading countries, organizations, and sources in this subject are found in advanced economies. In a similar vein, developed economies mostly collaborate in research. This can be viewed through the prism of state-of-the-art global research. Furthermore, [Figure 15](#) illustrates the relationships across countries, authors, publications, and associations as possible sources of illumination data. The relationships between the United Kingdom, Yonsei University, and Henninger Ce in providing a top-notch study on slow and sustainable literature are depicted in [Figure 15a](#). [Figure 15b](#) additionally highlights the relationships between KO E (author), sustainable fashion (keyword), and USA (country), since these relationships have helped produce significant insights in this field of study. [Figure 15c](#) illustrates the partnerships that have resulted in high-caliber research in this sector between Fletcher K (source), Henninger CE (author), and the United Kingdom (country).

5.2. Conclusion

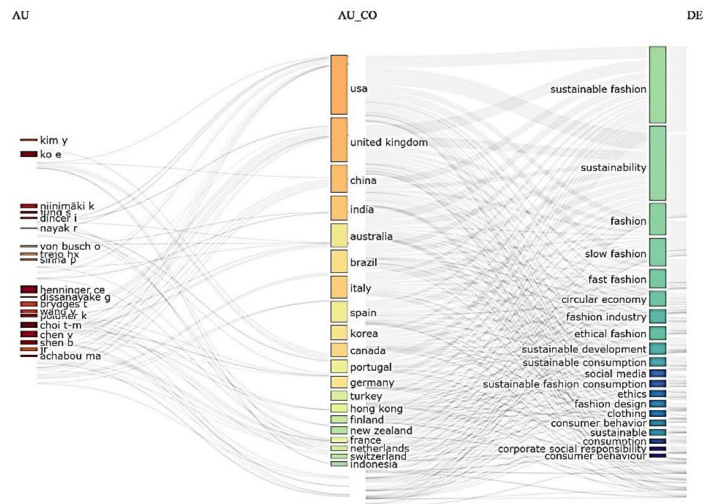
Globally, research on slow and sustainable fashion has expanded dramatically over the last few decades. Biblioshiny and Vosveiwier were utilized for bibliometric analysis of a dataset consisting of 343 documents to evaluate the evolution of scholarly research on this subject, identify the most influential points of view, and highlight research goals that are substantially advancing the body of literature. Bibliometrics provides information about the most pertinent authors, countries, themes, organizations, and sources. The ratio of publications to citations has increased over the last few decades. The results of the investigation indicate that sustainability (TP = 90) is the journal with the highest number of research articles published and the highest selection for studies using slow and sustainable fashion. The Journal of Global Fashion Marketing (TP = 17) and Journal of Fashion Marketing and Management (TP = 40) come next. The author who contributed the most was Choi T-M. The most widely cited paper worldwide is HUNT SD, 1986, J MACROMARK (TC = 176), whereas the most widely cited article locally is Joergens, 2006, J FASH MARK MANAGE (97 local citations). Additionally, Hong Kong Polytechnic University took the first place (34 publications), headed by Donghja University (27 publications) and Yonsei University (24 publications). The USA, the UK, and China have close working partnerships in the field of sustainable and slow fashion research. Cluster 1 was dominated by the theme of sustainability, which had the greatest number of linkages (82), the highest overall link strength (713), and was the most prominent theme.

Moreover, future trending topics, as per the analysis, are sustainable fashion and corporate social responsibility, sustainable development and economic development, consumer behavior and ethical fashion, luxury, social media, and trust. This analysis provides a framework for individuals entering the slow and sustainable fashion field by outlining scientific research areas and highlighting emerging trends in this sector. This study has certain limitations that may aid future researchers in broadening the scope of their work. One notable limitation of the present investigation is its exclusion of crucial databases such as 'The Web of Science and Google Scholar, among many others.'

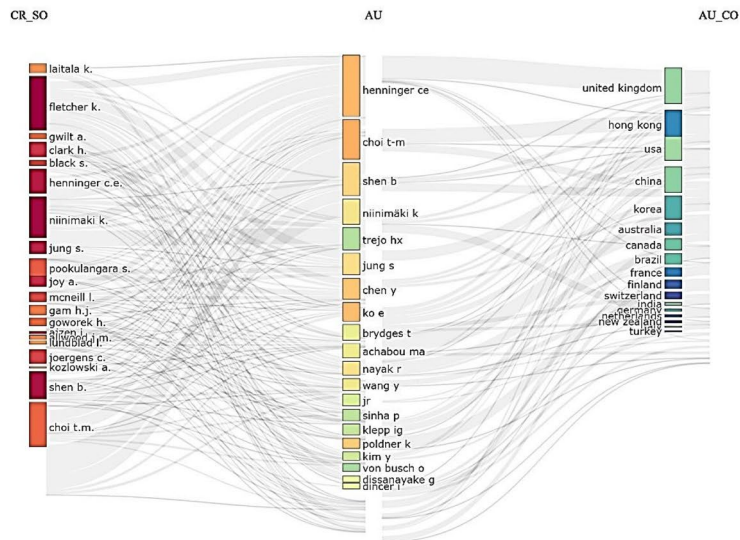
Future researchers can use Web of Science, Google Scholar, and many other databases to retrieve the dataset from the Scopus database. Furthermore, considering the volume of research conducted in this area and the impossibility of a single database offering a complete picture of a field of study with such a wide global impact, other research areas that merit additional study may involve the use of other databases or a combination of the two primary bibliometric databases, Web of Science and Scopus. Furthermore, the analysis only considered research publications published in English, and important materials published in numerous other languages were excluded. Lastly, the study's focus on articles primarily from developed or high-income countries, with limited representation from middle-income countries like Indonesia and India, further complicates generalizability. A more balanced distribution of research sources could yield dualistic insights, offering a richer understanding of the slow fashion phenomenon.



(a)



(b)



(c)

Figure 15. General trends in slow and sustainable fashion literature. Source: R- Studio.

6. Future research directions

6.1. Sustainable fashion and corporate social responsibility

Future research themes, as depicted in Figure 16, should focus on supply chain management and consumers' moral decision-making, particularly in relation to what drives and influences enterprises to embrace CSR programs in comparison to others (Testa et al., 2022). The foundational elements of corporate social responsibility (CSR) concerns in the fashion industry and the ways in which the sector uses CSR initiatives to boost earnings, cut expenses, and conduct business morally could be the main areas of concentration (Aggarwal, 2023). Moreover, the tendency to discard relatively new clothing has increased owing to the overconsumption of apparel. As a result, studies should be conducted to determine how this type of behavior contributes to disposal issues and how to address them by looking into clothing exchanges or model rentals for both new and used apparel (Satar et al., 2023). Furthermore, future studies could examine the connection between ethical consumption and personal behavior to comprehend the driving forces behind consumption.

6.2. Sustainable development and economic development

Three separate components are included in the complex notion of sustainable development, which is located at the nexus of the environment: environmental, social, and economic issues (Štefko & Steffek, 2018). The economy uses energy and natural resources from the environment to produce goods and services for society, resulting in emissions and pollution. Environmental pollution has increased with continued production (Preuit & Yan, 2016). It is essential to protect the environment from contamination caused by these activities to guarantee that future generations can access and use it for their requirements. In recent years, the idea of assessing quality of life has attracted much interest, especially in relation to sustainable development. Additionally, a healthy quality of life promotes economic development in any economy (J. Paul & Criado, 2020)

6.3. Consumer behaviour and ethical fashion

Consumers are the lifeblood of fashion industry. Thus, it is critical that they understand the brands, production processes, marketing strategies, and challenges faced by the fast-fashion industry. Consumers are prepared to pay more for apparel produced by businesses that use organic materials, provide decent salaries, uphold moral principles, or offer more durable goods. Therefore, to be more responsible and have an impact on customers' purchase decisions, rapid fashion needs to consider its products from their perspective. From this perspective, sustainable consumer behavior is beneficial for both individuals and

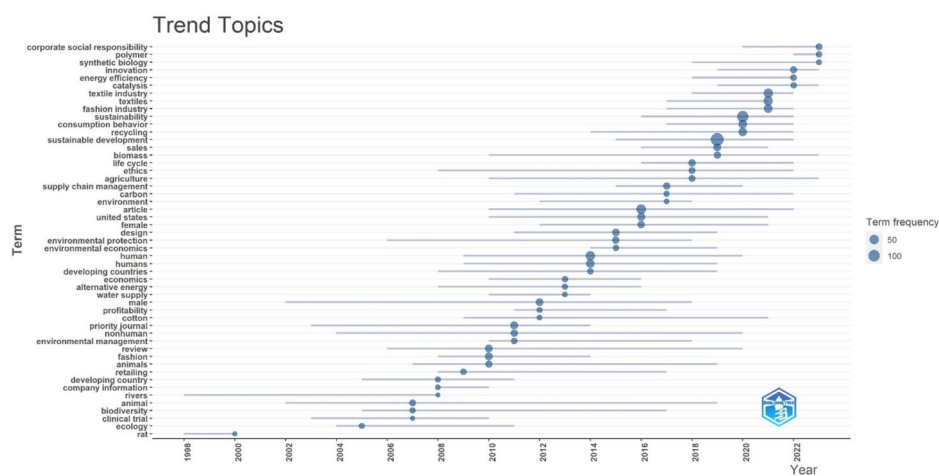


Figure 16. Trending topics.
Source: R Studio.

society. It is imperative for the fashion industry to adopt a more sustainable way of doing things. Understanding how to facilitate this change is crucial (Solino et al., 2020)

6.4. Luxury, social media, and trust

A plethora of materials are available on social media to enhance one's comprehension of sustainable fashion consumption. Social science studies may be able to capture social behaviors associated with sustainable fashion consumption as they are reflected in SM because GenY and GenZ are readily visible on the platform and share their everyday routines and activities (S. Jung & Jin, 2016). An ethnographic analysis could depict the relationships among members of communities of practice for sustainable fashion, or the evolving attitudes and beliefs of customers who begin implementing new sustainable behaviors without much information. The interplay between luxury, social media, and trust reshapes the fashion landscape (N. Paul et al., 2022). Social media emphasizes authentic involvement and unified online presence, making it a potent tool for brands to build and maintain trust.

The current study makes two significant contributions: (a) It sees slow fashion as a concept that is integrated with sustainable fashion, expanding the body of knowledge; (b) By providing a guide on 'existing research directions and suggesting the emerging tendencies in this field,' this analysis helps those who are new to the field of sustainable and slow fashion. It provides significant and accurate insights that policymakers, academics, and organizations may find useful.

Future research on sustainable fashion and corporate social responsibility (CSR) should focus on supply chain management and consumer ethical decision-making, particularly regarding what drives companies to adopt CSR initiatives (Testa et al., 2022). It is essential to explore the foundational elements of CSR in the fashion industry and how these efforts can enhance profits and ethical practices (Aggarwal, 2023), especially given the rising issue of clothing overconsumption and disposal, which calls for solutions like clothing exchanges or rentals (Satar et al., 2023). The concept of sustainable development, which encompasses environmental, social, and economic dimensions, underscores the need to balance economic growth with environmental protection to ensure resource availability for future generations (Preuit & Yan, 2016; Štefko & Steffek, 2018). Additionally, consumer behavior is crucial, as shoppers increasingly prefer brands that prioritize sustainability and ethics (Solino et al., 2020). The interplay between luxury, social media, and trust is also reshaping the fashion landscape, making social media a vital tool for brands to engage authentically with consumers (N. Paul et al., 2022). Overall, the study contributes valuable insights into slow and sustainable fashion, offering guidance for policymakers and industry stakeholders.

Authors' contribution

Deepanshi Aggarwal: Conceptualization, Writing—original draft preparation; Fazla Rabby: Conceptualization, Writing—review and editing, Software, Formal analysis, Visualization; Mochammad Fahlevi: Writing—original draft preparation, Methodology, Validation, investigation, Data curation, Project administration; Andhyka Muttaqin: Writing—review and editing, Validation, Investigation, Resources, Funding acquisition; Rohit Bansal: Writing—review and editing, Methodology, Visualization, Supervision, Project administration

Disclosure statement

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Data availability statement

The data presented in this study are available upon request from the corresponding authors.

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