Visualizing the Growth of Green Retailing: A Bibliometric Mapping of Sustainable Practices in Retail Marketing

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ABSTRACT

This study presents a bibliometric analysis of the academic literature on green retailing and sustainable practices in retail marketing, using data retrieved from the Scopus database (2000-2024). Employing VOSviewer for co-authorship, citation, and keyword co-occurrence analysis, the study identifies core research themes, influential contributors, and evolving trends in the field. The results reveal that "green retailing," "green marketing," and "cost optimization" are central to the scholarly discourse, reflecting the growing strategic importance of sustainability in retail operations. The analysis also uncovers a temporal shift from foundational environmental themes to more actionable managerial strategies. India stands out as a hub of international collaboration, and author network analysis highlights prominent research clusters around figures such as Sarkis J. and Lai K.H. While the literature has matured in linking green practices with business outcomes, emerging gaps include social dimensions of sustainability and digital transformation in retail. The study concludes with recommendations for future research directions that emphasize interdisciplinary inquiry and practical application in advancing sustainable retail marketing.

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1. INTRODUCTION

The growing urgency of environmental issues such as climate change, biodiversity loss, and resource depletion has fundamentally reshaped consumer expectations and corporate behavior across sectors. One of the most responsive and visible industries in this transition has been retail. As frontline actors in the consumption chain, retailers are uniquely positioned to influence consumer behavior and promote

sustainable practices [1], [2]. In recent years, the concept of green retailing has emerged as a strategic response to these pressures. Green retailing refers to environmentally conscious retail strategies that encompass sustainable sourcing, energy-efficient operations, ecofriendly product offerings, and responsible marketing [3]. This shift is not only driven by regulatory frameworks and ethical imperatives but also by evolving market demands, as consumers increasingly prefer

brands that align with sustainability values [4].

The expansion of green retailing has been accompanied by a parallel surge in academic interest, leading to the evolution of a multidisciplinary body of literature that insights blends from marketing, environmental science, consumer behavior, business strategy. Scholars examined a wide range of green retailing practices, from sustainable supply chain management to the use of eco-labels, green branding, and environmental communication [5]. This growing research field reflects not only an academic response to real-world transformations but also a deliberate effort to conceptualize and evaluate the efficacy of sustainable practices within retail contexts. However, despite this burgeoning body of work, the field remains fragmented, with limited synthesis of key themes, influential contributors, and the intellectual structure guiding the evolution of the discourse.

To address this gap, bibliometric analysis offers a systematic approach to mapping the development of the green retailing research landscape. Unlike traditional literature reviews, which are narrative and often subjective, bibliometric enables the visualization mapping scholarly output through quantitative indicators such as citation patterns, coauthorship networks, and keyword occurrences [6]. These tools allow researchers to uncover the structural patterns of the literature, identify influential authors and institutions, and detect emerging research clusters. In the context of green retailing, such a method is particularly useful given the interdisciplinary nature of the field and the diffusion of relevant studies across diverse academic journals.

Recent bibliometric studies on sustainability-related themes—such as green marketing, sustainable consumption, and circular economy—have demonstrated the power of this approach to reveal knowledge structures and highlight research gaps. However, green retailing, as a distinct and rapidly developing sub-field, has yet to be

thoroughly analyzed through a bibliometric lens. Understanding how the field has evolved, who the key knowledge producers are, and what thematic areas dominate the discussion is crucial not only for academic advancement but also for informing practice and policy in sustainable retailing.

Furthermore, the transformation of post-COVID-19 the retail sector has intensified the relevance of green retailing. Retailers worldwide are rethinking supply chains, customer engagement, and value propositions in response to heightened consumer consciousness and the push for sustainability in post-pandemic recovery strategies [7]. The intersection of digital transformation, environmental sustainability, and changing consumption patterns presents a rich area for academic inquiry. A comprehensive bibliometric mapping of green retailing literature is thus timely and necessary to capture this dynamic evolution and to support evidence-based strategies for sustainable retail growth.

Despite the growing volume of literature on green retailing, there remains a lack of consolidated understanding of the field's intellectual and thematic development. Existing studies are dispersed across multiple disciplines and lack a unified framework that captures the structure, trends, and key contributors in the domain. This fragmentation hampers the ability researchers and practitioners to build upon previous work effectively, identify critical research gaps, and advance theory and practice in sustainable retail marketing. This study aims to conduct a comprehensive bibliometric mapping of the green retailing literature to visualize its growth, intellectual structure, and thematic trends.

2. METHODS

This study employed a quantitative bibliometric analysis approach to systematically map and visualize the evolution of academic literature on green retailing and sustainable practices in retail marketing. Bibliometric analysis is

particularly effective for identifying intellectual structures, influential publications, and emerging research trends within a given field. The methodological process consisted of four main stages: data source selection, search strategy, data cleaning, and bibliometric analysis using visualization tools.

2.1 Data Source and Search Strategy

The data for this study were extracted exclusively from the Scopus database, which is widely recognized for its comprehensive coverage of peer-reviewed journal articles, proceedings, and conference scholarly outputs across disciplines. Scopus was chosen due to its advanced search capabilities, standardized indexing, and compatibility with bibliometric tools such as VOSviewer. To ensure the relevance of the dataset, the following search string was used in the title, abstract, and keywords fields: ("green retail*" OR "sustainable retail*" OR "eco retail*" OR "green marketing" AND "retail").

2.2 Data Cleaning and Preparation

The initial dataset underwent a cleaning process to remove duplicates, irrelevant records, and non-scholarly items such as editorials, errata, and notes. Only peer-reviewed journal articles, conference papers, and book chapters were retained. Metadata fields including authors, titles, abstracts, author keywords, affiliations, citations, and references were exported in

3. RESULTS AND DISCUSSION

3.1 Keyword Co-Occurrence Network

CSV and RIS formats compatible with the analysis software.

2.3 Analytical Tools and Techniques

The cleaned dataset was analyzed using VOSviewer (version 1.6.x), a specialized visualizing for constructing and bibliometric networks. Four primary analytical techniques were employed. First, co-authorship analysis was conducted to map collaboration patterns among authors, institutions, and countries, revealing key contributors and prominent research hubs within the field of green retailing. Second, citation analysis was used to identify the most cited publications, authors, and journals, providing insights into the foundational literature and the intellectual structure of the field. Third, keyword co-occurrence (coword) analysis was performed by examining author-supplied keywords to detect dominant research themes and emerging topics; this step utilized full counting with a minimum threshold of five kevword occurrences to ensure cluster relevance. Finally, thematic clustering and visualization were carried out through network and density maps, with clusters qualitatively interpreted based on keyword frequency and link strength. This comprehensive approach enabled a nuanced understanding of the thematic evolution, knowledge structures, and research gaps within sustainable retail marketing.

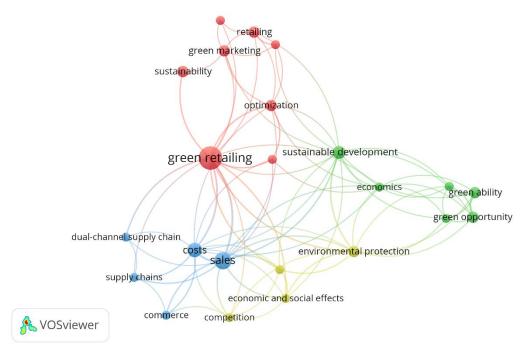


Figure 1. Network Visualization Source: Data Analysis Result, 2025

network visualization map illustrates the co-occurrence of keywords in green retailing literature, revealing thematic clusters and the structural relationships among key concepts in the field. At the center of the map is the dominant keyword "green retailing", signifying its centrality and frequency across the analyzed dataset. This term connects strongly to others such as "green marketing," "retailing," "optimization," and "sustainability," all of which form a tightly connected red cluster. This cluster reflects a strong focus on marketing and operational strategies that align retail activities with environmental the goals, showing that literature predominantly centers on how retail businesses communicate, implement, and optimize sustainability practices.

Moving towards the blue cluster on the left, the keywords "sales," "costs," "supply chains," and "commerce" represent a second major thematic area focused on the economic and logistical dimensions of green retailing. These terms suggest an emphasis on evaluating the financial and operational trade-offs involved in sustainable retail

practices, such as the cost-effectiveness of dual-channel green supply chains. distribution, and the impact on sales performance. This cluster reflects concern literature's with balancing sustainability goals against business profitability and operational efficiency. The green cluster on the right encompasses terms like "green ability," "green opportunity," "economics," and "sustainable development." This grouping highlights a strategic and policy-oriented perspective in the green retailing discourse, focusing on the opportunities for innovation and long-term growth that arise from embracing green principles. The presence of terms such as "economics" and "sustainable development" suggests that this stream of research connects green retailing with broader macroeconomic and sustainability frameworks, emphasizing its role in driving systemic change and enabling green transitions within the market.

Lastly, a smaller but important yellow cluster links keywords such as "environmental protection," "economic and social effects," and "sustainable development." This cluster signifies an

impact-focused lens, dealing with the broader consequences of green retailing practices on the environment and society. It reflects interdisciplinary interests that go beyond business performance to explore how retail strategies contribute to sustainability goals and influence ecological and societal outcomes.

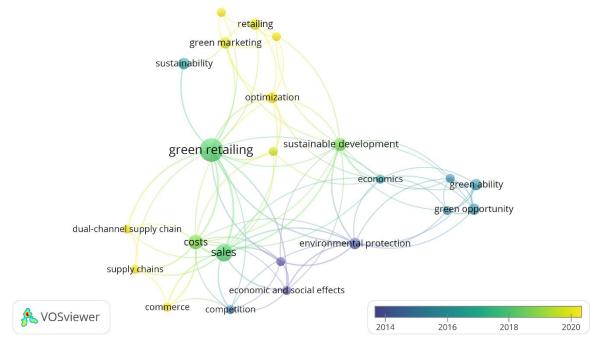


Figure 2. Overlay Visualization Source: Data Analysis Result, 2025

The overlay visualization provides a temporal dimension to the bibliometric keyword network in green retailing literature, colors represent the publication year associated with keyword. The yellow-colored nodes, such as "retailing," "green marketing," "optimization," indicate more recent research attention—clustered mainly in the upper part of the map and reflecting a growing interest in aligning retail and marketing functions with sustainability goals post-2018. This trend suggests that recent literature is emphasizing practical implementations and performance optimization strategies in green retailing as retailers move beyond theoretical commitments to more actionable sustainable practices. In contrast, keywords shown in darker shades of green and blue, such as opportunity," "green "environmental protection," and "economic

and social effects," are associated with earlier periods of research, typically around 2014-2016. These terms represent foundational discussions in the field, focusing on the macro-level implications of green practices, including policy alignment, social impact, and environmental outcomes. The clustering and color gradient suggest that initial research was more conceptual and systemic, laying the groundwork for subsequent, more application-focused studies retail operations and marketing strategy. Positioned centrally in the map and shaded in green, "green terms like retailing," "sustainable development," and "sales" serve as bridging concepts, linking earlier macrosustainability discussions with managerial and operational themes. These keywords represent the thematic core of the field and show consistent scholarly attention over time.

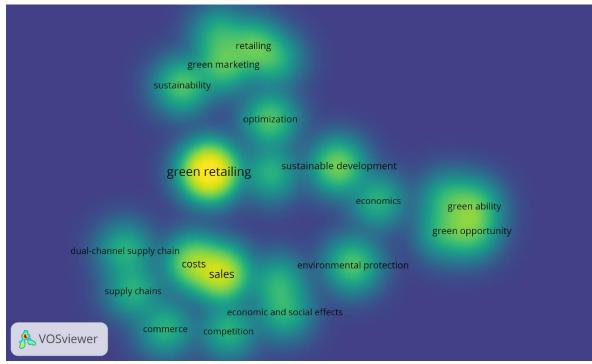


Figure 3. Density Visualization Source: Data Analysis, 2025

The density visualization provides insight into the frequency and intensity of keyword usage within the green retailing literature. The areas with brighter yellow regions, particularly around the terms "green retailing", "sales", and "costs", indicate the highest concentration of occurrences. These terms represent the core focus areas of research in this field, showing that most scholarly attention has centered on understanding how retail sustainability practices relate to business performance and financial implications. The convergence of these keywords suggests a strong academic interest in measuring and optimizing the economic outcomes of green initiatives in retail environments. Surrounding the core are moderately dense green zones, including keywords like "green marketing," "retailing," "sustainability," and "sustainable development." These terms, while slightly less prominent, still show significant scholarly interest and reflect the strategic and conceptual frameworks underpinning green practices. Meanwhile, retailing peripheral terms such as "green ability," "green opportunity," "competition," and "economic and social effects" appear in lower-density blue regions, indicating that these themes, although relevant, are either emerging or less frequently explored.

3.2 Co-Authorship Network

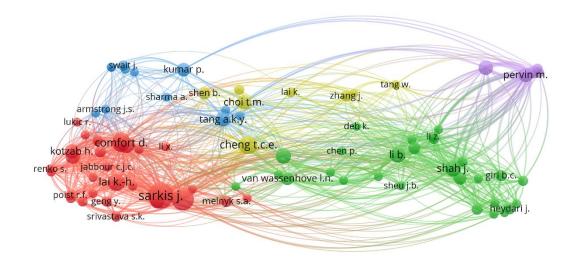




Figure 4. Author Collaboration Visualization Source: Data Analysis, 2025

The network visualization displays the co-authorship network among scholars contributing to the field of green retailing and sustainable retail practices. Each node represents an author, and the size of the node reflects the author's publication volume or citation strength, while the connecting lines indicate co-authorship links. The map is divided into several color-coded clusters, distinct suggesting the presence collaborative research communities. Notably, Sarkis J., located at the center of the red cluster, emerges as a central figure in the literature, collaborating widely with scholars like Lai K.H. and Comfort D. The green

cluster, which includes prolific authors such as Li B., Shah J., and Sheu J.B., suggests another influential research community focusing on operational and quantitative aspects of sustainable retailing. Meanwhile, Pervin M. appears isolated in the purple cluster, indicating a strong but more specialized or independent research stream. The dense interlinkages among clusters underscore a high degree of interdisciplinary collaboration across supply management, marketing, and environmental sustainability, illustrating the diverse yet interconnected nature of authorship in this field.

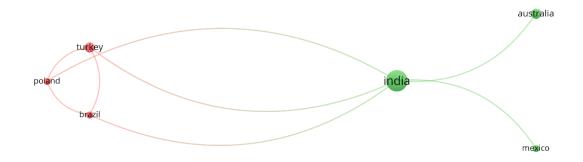




Figure 5. Country Collaboration Visualization Source: Data Analysis, 2025

This visualization depicts the coauthorship network between countries in the field of green retailing, highlighting international research collaborations. The central and most prominent node is India, indicating that it is the most active and collaborative country within this dataset. India has established bilateral research ties with both developed countries such as Australia and Mexico, as well as emerging economies like Brazil, Turkey, and Poland. The strength and number of connecting lines suggest that India serves as a hub of global scholarly collaboration in sustainable retailing. In contrast, countries like Turkey, Poland, and Brazil show a more localized and interconnected triad, suggesting regional cooperation. This network reveals India's strategic role in linking diverse geographic regions, reinforcing its position as a leader in the global discourse on sustainable retail practices.

3.3 Citation Analysis

Table 1. Top Cited Research

Citations	Authors and year	Title
614	[8]	Against the Green: A Multi-method Examination of the Barriers to
		Green Consumption
300	[9]	Why do retail consumers buy green apparel? A knowledge-
		attitude-behaviour-context perspective
369	[10]	Does environmentally responsible purchase intention matter for
		consumers? A predictive sustainable model developed through an
		empirical study
229	[11]	Slow fashion movement: Understanding consumer perceptions-
		An exploratory study
186	[12]	Green marketing' functions in building corporate image in the
		retail setting
159	[1]	Green retailing: Factors for success

Citations	Authors and year	Title
134	[13]	Known unknowns: Indirect energy effects of information and communication technology
116	[14]	The influence of green marketing strategies on business performance and corporate image in the retail sector
111	[15]	Retail investor attention and corporate green innovation: Evidence from China
106	[16]	A green inventory model with the effect of carbon taxation

Source: Scopus, 2025

Discussion

The findings of this bibliometric analysis reveal a dynamic and evolving research landscape in green retailing, marked by an increasing academic interest in sustainable practices within retail marketing. The centrality of the keyword "green retailing" in all visualizations underscores its role as a foundational theme that integrates dimensions—ranging marketing and logistics to economic impact environmental responsibility. presence of terms such as "sales," "costs," "sustainability," and "green marketing" in close proximity reflects how green retailing is not viewed merely as an ethical obligation but also as a strategic tool for enhancing business performance and consumer engagement.

The co-word network map revealed a strong concentration of keywords around business and marketing constructs. The red cluster, comprising terms like marketing," "optimization," and "retailing," reflects a growing academic discourse around the operationalization of sustainability within retail strategy. This aligns with recent shifts in paradigms business where companies integrate environmental considerations into marketing, branding, and customer relationship management [17]. These themes are often explored in conjunction with the perceived benefits of sustainability on brand loyalty, customer satisfaction, and market competitiveness.

The blue cluster, focused on "supply chains," "commerce," and "costs," emphasizes the operational challenges and performance metrics involved in implementing green retail practices. This mirrors the real-world complexities faced by

retailers in transitioning toward eco-efficient supply chains and cost-sensitive sustainability innovations (Tang & Zhou, 2012). Retailers are under increasing pressure to balance environmental commitments with profitability—requiring models that quantify the trade-offs and synergistic effects of sustainable operations. Studies in this cluster typically involve quantitative assessments, often grounded in logistics, supply chain management, and cost-benefit analysis.

In parallel, the green and yellow clusters, centering around "sustainable development," "economics," "green opportunity," and "environmental protection," point to a more conceptual and strategic discourse. This strand of research connects retailing activities to broader developmental goals, such as the Sustainable Development Goals (SDGs), circular economy principles, and systemic environmental governance [18]. The inclusion of terms like "green opportunity" and "green ability" suggests a growing recognition of retailers not just as reactive agents to consumer demand but as proactive catalysts for ecological innovation and socio-economic transformation.

The overlay visualization provided a temporal dimension, showing the chronological evolution of themes within the field. Earlier literature (around 2014–2016) focused on foundational concepts such as "environmental protection," "economic and social effects," and "green opportunity." These terms were primarily explored through theoretical and policy-based frameworks, laying the groundwork for what would become a more practice-oriented discipline in subsequent years. As the timeline progresses,

more recent terms like "green marketing," "retailing," and "optimization" appear in yellow, signaling a shift toward tactical and managerial concerns. This temporal progression aligns with the global trend where sustainability has moved from the periphery of corporate responsibility to the core of business strategy [19].

The density visualization further reinforced these findings by highlighting the most intensively studied areas. Keywords such as "green retailing," "sales," and "costs" appeared in bright yellow, reflecting a high of occurrence frequency and central importance in the research landscape. These hotspots represent the key focal points of scholarly attention and suggest that economic performance indicators remain a primary concern in assessing the viability of green initiatives. The relative dimness of areas like "competition," "economic and social effects," and "green opportunity" indicates potential gaps or underdeveloped areas that future research could explore in greater depth.

In terms of authorial influence and collaboration, the co-authorship network map several prolific clusters researchers. Leading figures such as Sarkis J., Comfort D., and Lai K.H. stood out for their central positions and dense collaborative ties. These authors are known for contributions to sustainable supply chains, environmental green logistics, and performance in retail and manufacturing contexts [20]. The visual clustering also suggested thematic groupings-some focusing on quantitative modeling, others on behavior consumer or macroeconomic impacts. Notably, the green cluster featured authors like Li B., Shah J., and Sheu J.B., who have explored computational and optimization-based approaches to green operations, indicating methodological focus in this sub-community.

Interestingly, Pervin M. emerged as a distinct node in a separate purple cluster, suggesting either niche specialization or limited co-authorship with the broader scholarly community. Such outlier authors may be contributing unique perspectives or

working within different disciplinary boundaries, such as environmental sociology, policy analysis, or emerging markets. The diversity of collaborative patterns across clusters reflects the interdisciplinary nature of green retailing research—spanning business, environmental science, economics, and engineering.

country collaboration map The highlighted India as a central actor in global green retailing research. India's extensive bilateral links with countries such as Australia, Mexico, Brazil, and Turkey reflect a growing international engagement, possibly driven by India's strategic interest in sustainable development and The presence modernization. of countries like Poland and Turkey suggests regional research networks focusing on localized sustainability challenges and retail practices. However, the absence of major research hubs such as the United States, United Kingdom, or China in this particular map may point to either dataset limitations or an opportunity to foster north-south collaboration in future projects.

The geographic pattern also suggests that emerging economies are taking a leading role in research related to sustainable retailing-possibly due to their unique challenges such as rapid urbanization, infrastructure gaps, and evolving consumer behavior. These contexts provide fertile ground for experimental models of green retailing that are socially inclusive, resourceefficient, and economically viable. Policymakers and multinational retailers operating in these regions can draw on the growing body of local knowledge to inform strategies that are both globally informed and locally responsive.

Taken together, the bibliometric findings offer several implications for future research. First, there is a need to deepen the exploration of consumer behavior and perception in green retailing, especially in developing markets where price sensitivity and awareness levels vary greatly. Second, scholars should further investigate digital transformation and its intersection with

sustainability—particularly how technologies like AI, blockchain, and IoT can optimize green retail operations. Third, longitudinal studies examining the impact of green retail practices on firm performance and customer loyalty over time could provide empirical evidence to validate strategic decisions.

4. CONCLUSION

This bibliometric study provides a comprehensive overview of the intellectual landscape, thematic evolution. and collaborative patterns within the domain of green retailing. The findings highlight that green retailing is a rapidly expanding interdisciplinary field that integrates marketing strategies, supply chain management, and sustainable development goals. The keyword and co-authorship analyses revealed dominant research themes around green marketing, cost efficiency, and operational optimization, alongside growing interest in strategic environmental contributions such sustainable

development and green innovation. The temporal and density visualizations further confirmed a transition from conceptual frameworks to applied, performance-focused studies in recent years. India emerged as a central player in the international collaboration network, underscoring its growing influence and research productivity in the sustainable retailing space. Additionally, notable author clusters and regional research communities suggest a vibrant and interconnected scholarly ecosystem. Despite the progress, gaps remain in areas such as social equity, consumer inclusivity, and technological transformation within green retailing. Future studies are encouraged explore these underrepresented areas through diverse methodological approaches and collaborations. Overall, this mapping serves as a valuable foundation for scholars, practitioners, and policymakers seeking to navigate and contribute to the evolving discourse sustainability on in marketing.

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