

# A Bibliometric Analysis of the Effectiveness of Green Labeling in Enhancing Consumer Value Perceptions

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## ABSTRACT

Green labeling has emerged as a critical tool for promoting sustainable consumption by signaling a product's environmental benefits. However, the effectiveness of green labels in enhancing consumer value perceptions remains a subject of debate due to issues such as greenwashing, label proliferation, and consumer skepticism. This study employs a bibliometric analysis using data exclusively from Scopus and analyzed through VOSviewer to systematically map the intellectual structure of research on green labeling and consumer value perceptions. The findings reveal that key research themes include sustainability, green marketing, consumer behavior, purchase intention, and willingness to pay, with a noticeable shift towards consumer-driven sustainability trends in recent years. Co-authorship network analysis indicates that research is dominated by two major clusters—Western scholars focusing on behavioral models and Asian researchers emphasizing corporate sustainability and trust in eco-labels. While green labels positively influence perceived consumer value, their effectiveness is contingent on factors such as label credibility, standardization, and consumer education. Challenges such as eco-label confusion, cost barriers, and inconsistent regulatory enforcement remain pressing concerns. The study highlights the need for standardized regulations, technological integration (e.g., blockchain for label verification), and cross-cultural studies to improve green labeling's impact. The insights from this research provide a comprehensive understanding of the evolution of green labeling literature, offering practical implications for businesses, policymakers, and researchers seeking to enhance consumer trust in sustainable products.

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## 1. INTRODUCTION

In recent decades, heightened awareness of environmental sustainability has profoundly reshaped global markets and

consumer behavior. Increasing concerns about climate change, resource scarcity, and environmental degradation have motivated both individuals and organizations to seek more responsible ways of living and conducting business [1], [2]. In response to these concerns, many companies have adopted green labeling as a strategic tool to signal their commitment to eco-friendly practices. Green labels, which verify that a product meets specific environmental criteria, serve not only to differentiate products in competitive marketplaces but also to build consumer trust and loyalty. As environmental issues have moved to the forefront of public discourse, green labeling has emerged as an essential element in modern marketing strategies, fostering a connection between sustainable business practices and enhanced consumer perceptions of value [3]. This trend reflects an evolving market where environmental responsibility is increasingly equated with quality and reliability.

The notion of consumer value has evolved significantly over time. Traditionally, value was assessed primarily on the basis of functional benefits, such as product quality and price. However, contemporary consumers are now more likely to evaluate a product on its ethical and environmental merits as well. Green labels act as a communicative tool that conveys not just the functional attributes of a product, but also its social and environmental benefits [4], [5]. This expanded understanding of value encompasses intangible benefits, including emotional satisfaction and a sense of contributing to environmental sustainability. As consumers become more environmentally conscious, they are increasingly willing to support brands that visibly incorporate sustainable practices into their operations [6]. Thus, green labeling not only informs consumers about a product's environmental performance but also enhances its perceived overall value, ultimately influencing purchasing decisions.

The evolution of green labeling itself has been a dynamic process characterized by both innovation and regulatory

developments. Early environmental labels were often vague and inconsistent, leading to consumer confusion and instances of "greenwashing" where companies exaggerated their environmental credentials [7], [8]. Over time, however, the introduction of standardized guidelines and the emergence of independent certification bodies have significantly improved the reliability and clarity of green labels. These improvements have made green labeling a more effective tool for communicating genuine environmental performance [9]. Moreover, as regulatory frameworks have become more robust, consumers now have access to more credible and transparent information regarding the sustainability of products. This progress has contributed to a more informed consumer base and has further reinforced the potential of green labeling to positively influence consumer value perceptions [10].

In parallel with these market and regulatory developments, the methodological approaches used to investigate green labeling and its impacts have also advanced. Bibliometric analysis has emerged as a powerful research tool that systematically examines trends, patterns, and the evolution of academic literature in a given field. By mapping the growth and structure of research on green labeling, bibliometric studies can identify influential works, key authors, and emerging themes that have shaped our understanding of environmental marketing and consumer behavior [11]. This method not only helps in cataloging the progress made over the years but also provides insights into the interdisciplinary nature of sustainability research. In the context of green labeling, bibliometric analysis offers a unique opportunity to quantify and visualize how academic discourse has evolved and how it continues to influence both theory and practice [12].

Despite the growing body of literature on green labeling and sustainable consumer behavior, there is a notable gap in research that specifically integrates these themes into a comprehensive framework of consumer value perceptions. While many

studies have examined the environmental, economic, or functional aspects of green labeling independently, few have synthesized these findings to explore how green labels impact the overall perceived value of a product. This fragmented research landscape makes it challenging for academics and practitioners to fully appreciate the multifaceted benefits of green labeling. Given the rapid proliferation of studies in this area, there is a pressing need for an analytical approach that can systematically aggregate and assess the evidence on how green labeling influences consumer perceptions. A bibliometric analysis can serve this purpose by revealing the intellectual structure and trends within this diverse body of literature, thereby providing clarity on how environmental certifications contribute to consumer value [13], [14].

Despite the recognized importance of green labeling in promoting sustainable consumption and enhancing consumer trust, the existing literature remains fragmented and lacks a unified framework for understanding its overall impact on consumer value perceptions. Numerous studies have addressed various dimensions of green labeling—from consumer attitudes and purchasing behavior to the efficacy of certification standards—yet they often do so in isolation without considering the cumulative effect on perceived value. This fragmentation creates challenges in identifying best practices and in understanding the broader implications of green labeling initiatives. Without a consolidated synthesis of the literature, researchers and industry practitioners are left with unanswered questions about the mechanisms through which green labeling drives consumer value and how these effects vary across different contexts. The absence of an integrated bibliometric analysis hampers efforts to develop coherent strategies that leverage green labeling for enhanced consumer engagement and sustainable business growth [15].

The objective of this study is to conduct a comprehensive bibliometric

analysis to evaluate the effectiveness of green labeling in enhancing consumer value perceptions. By systematically reviewing and synthesizing the extant academic literature, this research aims to map the intellectual landscape of green labeling studies, identify prevailing themes and research trends, and pinpoint areas where further investigation is warranted. Through this integrative approach, the study seeks to provide a robust framework that clarifies how green labels contribute to perceived consumer value, thereby offering actionable insights for both scholars and industry practitioners. Ultimately, the findings are expected to inform more effective marketing strategies and policy decisions that promote sustainable consumption practices and reinforce consumer trust in environmental certifications.

## 2. LITERATURE REVIEW

The concept of green labeling has evolved considerably over recent decades, mirroring growing global concerns over environmental degradation and climate change. Early literature on green labeling predominantly focused on its role as a marketing tool that communicates environmental benefits to consumers [16]. Scholars have defined green labels as indicators, either through symbols, certifications, or logos, that signal a product's compliance with specific environmental standards [17]. The initial enthusiasm for green labels stemmed from their potential to differentiate environmentally friendly products in an increasingly competitive market. Over time, the evolution of green labeling has been driven by both regulatory changes and advancements in certification processes, leading to the development of more robust and credible labeling systems [18]. This transformation has been accompanied by an academic interest in understanding not only the environmental benefits of such labels but also their broader implications on consumer behavior and market dynamics.

Consumer value perceptions constitute a central theme in the study of green labeling. Traditionally, consumer value was measured by the functional benefits of a product, such as quality, performance, and price [19]. However, with increasing awareness of environmental issues, consumers now integrate ethical, social, and environmental considerations into their evaluation of product value [20]. Research has shown that green labels can enhance perceived consumer value by associating products with environmental responsibility and sustainability [21]. This shift in perception is underpinned by the idea that consumers derive satisfaction not only from the tangible attributes of a product but also from the positive social and environmental impact of their consumption choices [22]. Consequently, green labeling is no longer viewed solely as a tool for environmental compliance but also as a mechanism for enhancing consumer trust and loyalty by aligning product attributes with consumer values.

The effectiveness of green labeling in enhancing consumer value perceptions has been widely discussed in the literature, though findings remain mixed. On one hand, several empirical studies have demonstrated that green labels can lead to a significant increase in consumers' willingness to pay a premium for environmentally certified products [23]–[25]. These studies suggest that when consumers perceive a product as environmentally responsible, the overall value proposition is enhanced, leading to improved brand equity and competitive advantage. On the other hand, some researchers have pointed out that the influence of green labels on consumer behavior is moderated by factors such as consumer skepticism, the credibility of the certification body, and the perceived authenticity of the environmental claims [26]. In contexts where greenwashing—where companies exaggerate or misrepresent their environmental credentials—is prevalent, the potential for green labels to enhance consumer value can be significantly

undermined [27]. These contrasting findings highlight the complexity of the relationship between green labeling and consumer value perceptions, indicating that both the design of the label and the broader regulatory and market environment play crucial roles.

Another strand of research in this domain has examined the challenges associated with green labeling, particularly in the context of greenwashing and inconsistent certification standards. Greenwashing occurs when companies make misleading claims about the environmental benefits of their products without substantive backing, leading to consumer distrust and market distortion [28]. Scholars argue that greenwashing not only damages the credibility of green labels but also negatively affects consumer value perceptions by eroding trust [29]. The literature emphasizes the importance of establishing rigorous, transparent, and standardized criteria for green labeling to safeguard consumer interests and ensure that environmental claims are both verifiable and meaningful [30]. In response to these challenges, regulatory bodies and independent certification agencies have been increasingly involved in monitoring and enforcing compliance with environmental standards, thereby enhancing the overall legitimacy of green labels. Despite these improvements, however, the persistence of ambiguous labeling practices in certain markets continues to be a significant concern for both academics and practitioners, underscoring the need for further research into the mechanisms that can enhance the credibility and effectiveness of green labels.

Complementing the empirical investigations into green labeling and consumer behavior, bibliometric analyses have emerged as a powerful methodological approach to map and synthesize the evolving body of literature in this field. Bibliometric methods involve the quantitative analysis of academic publications to identify trends, key themes, influential works, and collaboration networks [31]. In recent years, bibliometric studies have been applied to various aspects

of sustainability research, providing insights into how academic discourse on green labeling has developed over time [12]. Such analyses are particularly useful in areas like green labeling, where the literature spans multiple disciplines including marketing, environmental science, and regulatory policy. By systematically reviewing citation patterns and co-authorship networks, researchers can gain a clearer picture of the intellectual structure underlying green labeling research, identifying seminal works that have shaped the field as well as emerging topics that warrant further exploration. Moreover, bibliometric techniques help in highlighting research gaps and inconsistencies, thus guiding future investigations towards areas that hold promise for enhancing the understanding of how green labeling influences consumer value perceptions.

Integrating the diverse strands of research reviewed above, it becomes evident that green labeling occupies a critical nexus between environmental sustainability and consumer marketing. The literature underscores the transformative potential of green labels to reshape consumer value perceptions by aligning product attributes with ethical and environmental considerations [32]. However, the mixed empirical evidence regarding the efficacy of green labels in driving consumer behavior suggests that the relationship is both multifaceted and context-dependent. While some studies advocate the effectiveness of green labels in enhancing consumer

willingness to pay and brand loyalty, others caution that issues such as greenwashing and inconsistent certification standards may compromise these benefits. This divergence in findings points to the necessity of adopting integrative analytical frameworks, such as bibliometric analysis, to systematically aggregate and interpret the existing research.

### 3. METHODS

This study employs a bibliometric analysis using data exclusively sourced from the Scopus database to explore the relationship between green labeling and consumer value perceptions. A systematic search was conducted in Scopus using a refined set of keywords—such as “green labeling,” “environmental certification,” “consumer value,” and “sustainable consumption”—to retrieve relevant literature published between 2000 and 2025. The search was limited to peer-reviewed articles, conference proceedings, and book chapters to ensure the inclusion of high-quality, scholarly contributions. Bibliographic data—including titles, abstracts, keywords, publication years, and citation counts—were extracted and subsequently analyzed using VOSviewer, a specialized bibliometric software tool renowned for its ability to create detailed visualizations of citation networks, co-authorship patterns, and keyword co-occurrence clusters [33].

### 4. RESULTS AND DISCUSSION

Table 1. Top Cited Research

Citations	Authors and year	Title
3015	[29]	An overview of polylactides as packaging materials
1093	[34]	Sustainable consumption: Green consumer behaviour when purchasing products
825	[30]	Determinants of Consumers' Green Purchase Behavior in a Developing Nation: Applying and Extending the Theory of Planned Behavior
752	[32]	The sustainability liability: Potential negative effects of ethicality on product preference

Citations	Authors and year	Title
728	[35]	Thermolysis of waste plastics to liquid fuel. A suitable method for plastic waste management and manufacture of value added products-A world prospective
722	[36]	Implementation of circular economy business models by small and medium-sized enterprises (SMEs): Barriers and enablers
721	[37]	How can corporate social responsibility activities create value for stakeholders? A systematic review
699	[38]	Exploring consumer attitude and behaviour towards green practices in the lodging industry in India
674	[39]	Review of Green Food Processing techniques. Preservation, transformation, and extraction
672	[40]	Pro-environmental products: Marketing influence on consumer purchase decision

Source: Scopus, 2025

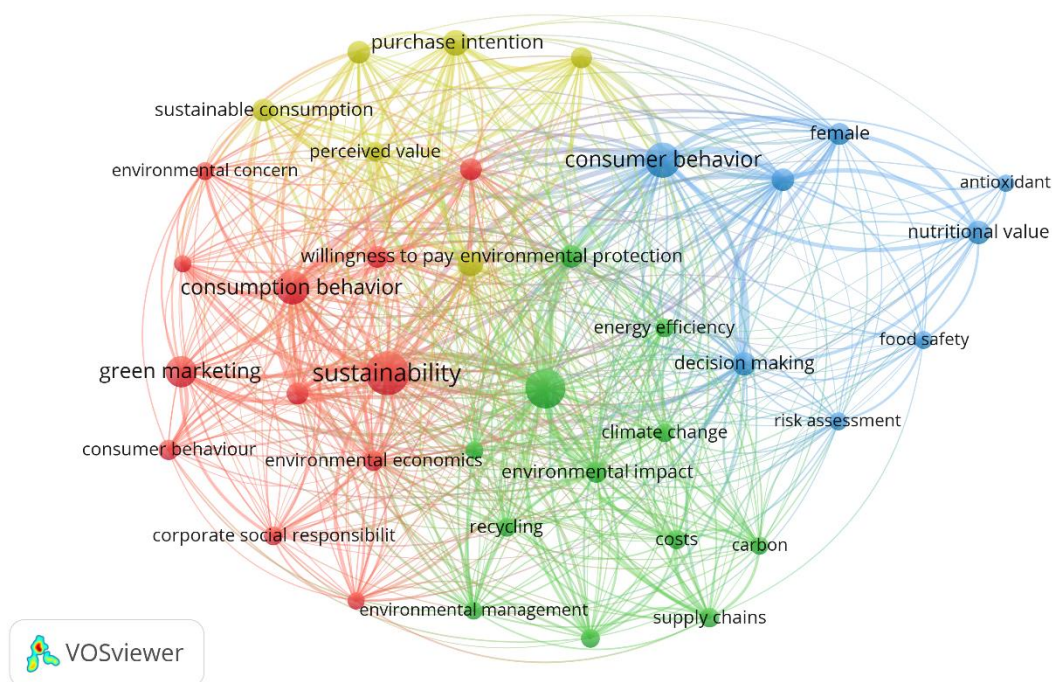


Figure 1. Network Visualization

Source: Data Analysis Result, 2025

The visualization represents a bibliometric network analysis of keywords associated with research on green labeling, consumer behavior, and sustainability. The network is structured into clusters, with nodes representing keywords and the connections (edges) illustrating their co-occurrence in academic literature. The size of each node indicates the frequency of the keyword's appearance, while the thickness of connections signifies the strength of the relationship between concepts. The different

colors in the visualization denote clusters of closely related keywords, helping to identify distinct thematic areas in the field. One of the most prominent clusters, shown in red, revolves around sustainability, green marketing, and consumption behavior. This cluster highlights the strong association between sustainability practices and consumer purchasing decisions, suggesting that studies frequently explore how green marketing strategies influence consumer choices. Terms like "environmental concern,"

"corporate social responsibility," and "willingness to pay" indicate that research in this area often investigates ethical and economic motivations driving consumer behavior. The presence of "perceived value" in this cluster further implies that consumers factor sustainability attributes into their overall evaluation of products.

The **green cluster** focuses on **environmental impact, climate change, and supply chains**, reflecting research that examines how businesses integrate sustainability into operations. Keywords like "energy efficiency," "recycling," and "environmental management" suggest that scholars frequently discuss corporate initiatives aimed at reducing environmental footprints. This cluster underscores the role of green labeling in validating such sustainability efforts, ensuring that consumers recognize and trust the environmental benefits of products. The connections between "costs" and "carbon" suggest that economic considerations remain central in the discussion, emphasizing the need for sustainable practices to balance profitability and environmental responsibility.

The **yellow cluster** highlights **consumer decision-making, purchase intention, and sustainable consumption**, indicating a strong focus on the psychological and behavioral aspects of green consumerism. Keywords like "perceived value" and "willingness to pay" suggest that much of the research is dedicated to understanding how

consumers evaluate green products and what motivates their purchasing decisions. The interconnections between sustainability and decision-making indicate that green labels play a crucial role in shaping consumer preferences by providing credible environmental information. The blue cluster is more distinct, concentrating on food safety, antioxidants, and nutritional value, which suggests that some research in this field extends beyond traditional sustainability topics into health-related aspects of green labeling. The presence of "risk assessment" and "female" as a notable keyword indicates that demographic factors, such as gender, might be considered in studies analyzing consumer trust in green certifications. This cluster points to an interdisciplinary overlap where sustainability intersects with food sciences, reinforcing the broader relevance of green labeling in consumer markets.

The bibliometric network analysis reveals a diverse research landscape encompassing marketing, environmental sustainability, consumer behavior, and operational strategies. The interconnectedness of clusters underscores the multidisciplinary nature of green labeling research, with strong ties between business practices, consumer psychology, and environmental responsibility. These insights emphasize the growing importance of green labeling in influencing consumer perceptions, driving sustainable consumption, and shaping corporate sustainability strategies.



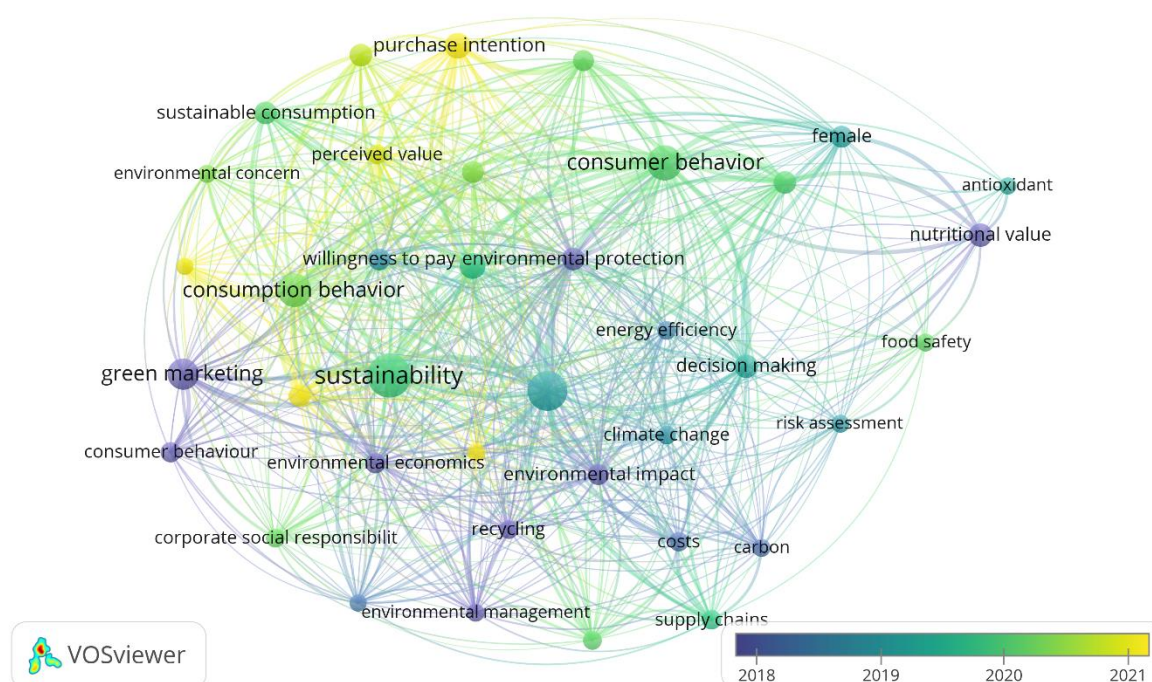


Figure 2. Overlay Visualization

Source: Data Analysis Result, 2025

The VOSviewer visualization presented is a bibliometric analysis of keyword co-occurrence, showing how research themes related to green labeling, sustainability, and consumer behavior have evolved over time. The color gradient (from dark blue to yellow) represents the average publication year of studies containing these keywords, with darker colors indicating older research (2018-2019) and lighter colors representing more recent studies (2020-2021). This allows us to observe shifts in research focus and emerging trends in the field.

The core research themes remain centered around sustainability, consumer behavior, and green marketing, indicating their consistent presence in the literature over time. However, newer research (yellow nodes) has increasingly focused on topics like purchase intention, perceived value, and sustainable consumption, suggesting a shift toward behavioral aspects of consumer decision-making regarding green products. This implies that recent studies are delving deeper into understanding how green labeling influences consumer purchasing decisions and willingness to pay for

environmentally friendly products. Additionally, the connections between environmental concern, corporate social responsibility, and decision-making indicate a growing interest in the psychological and ethical motivations behind consumer preferences for sustainable goods.

Another noticeable trend is the **emergence of health-related topics** such as **food safety, nutritional value, and antioxidants**, which are clustered in the **blue and green areas** (representing research from 2018-2019). While these studies were prominent a few years ago, their relevance remains, albeit with a shift toward **risk assessment and consumer trust in eco-labeled food products**. Meanwhile, sustainability-related keywords like **climate change, energy efficiency, and supply chains** continue to be extensively studied, reinforcing their **long-term significance** in both academic research and business strategies. This evolving landscape underscores the dynamic nature of green labeling research, showing a transition from **broad sustainability discussions to more**



consumer-centric and behavioral studies in recent years.

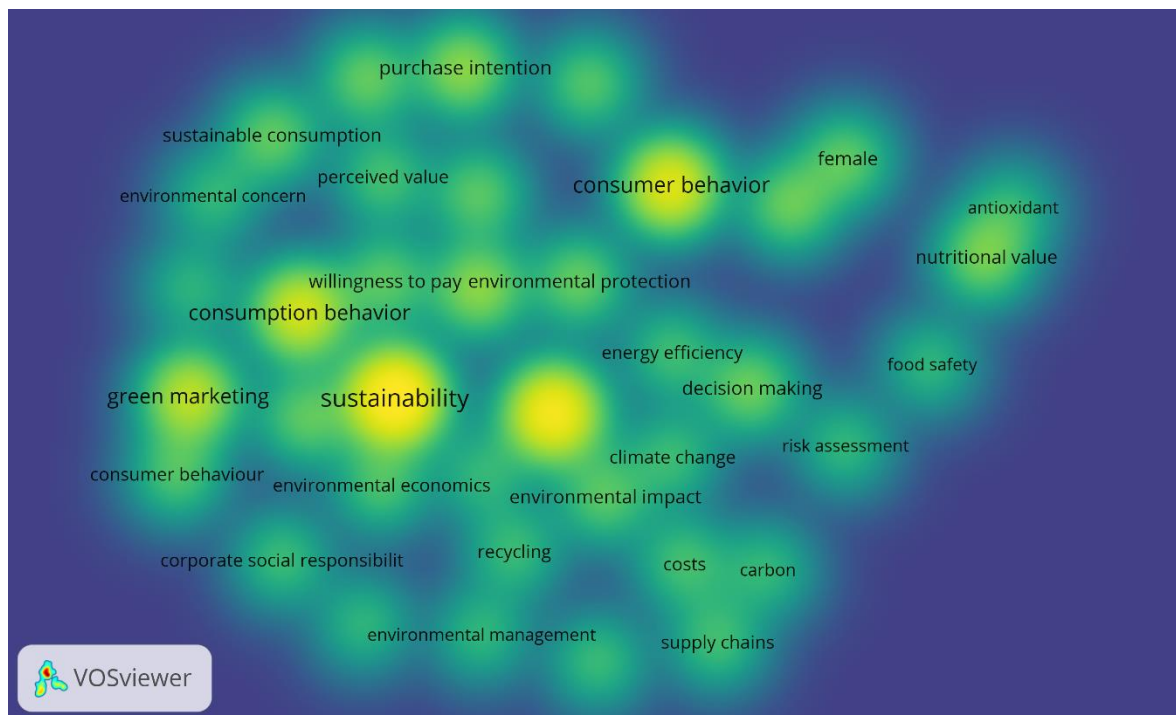


Figure 3. Density Visualization

Source: Data Analysis, 2025

The heatmap visualization from VOSviewer represents the density of keyword occurrences in the academic literature related to green labeling, sustainability, and consumer behavior. Brighter areas (yellow spots) indicate keywords with higher occurrence and stronger connections, while darker areas (green to blue) signify lower density in terms of research attention. The most prominent keywords in this heatmap include “sustainability,” “consumer behavior,” “green marketing,” and “consumption behavior,” reflecting their central role in discussions around eco-labeling and consumer decision-making. The clustering of terms such as “purchase intention,” “willingness to pay,” and “perceived value” suggests a strong research focus on how consumers perceive and respond to green labels in purchasing decisions.

Additionally, the heatmap highlights emerging research trends. Topics such as “food safety,” “nutritional value,” and “risk assessment” show growing interest, particularly in health-related sustainability concerns. Keywords like “climate change,” “carbon,” and “environmental impact” remain relevant but appear in less dense regions, indicating a broader but less frequently co-occurring discussion. Meanwhile, supply chains, environmental management, and corporate social responsibility are gaining traction, signaling a shift towards examining sustainability practices within businesses and production systems. This visualization reinforces the multidisciplinary nature of green labeling research, spanning marketing, environmental science, consumer psychology, and corporate strategy.

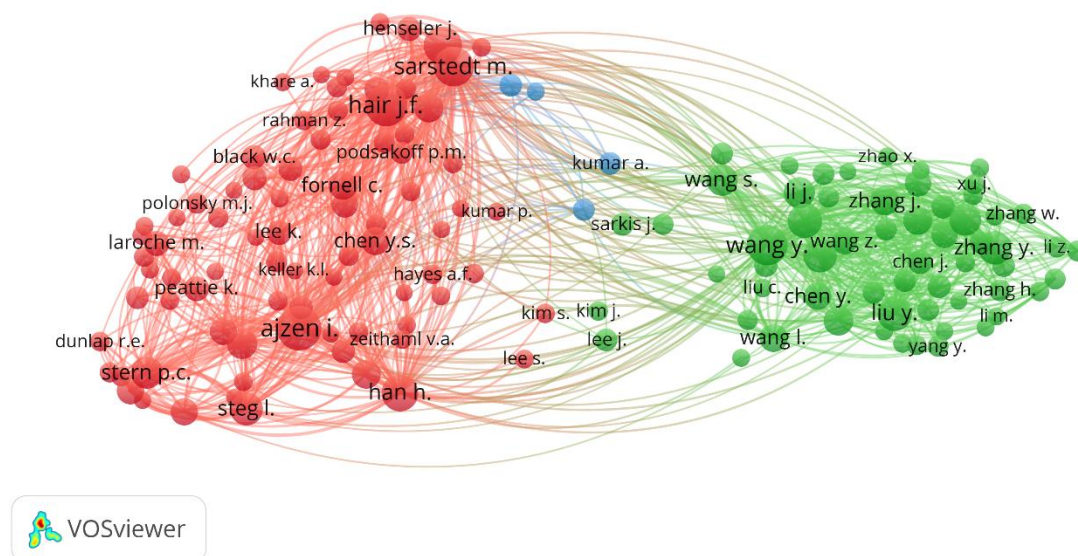


Figure 4. Author Collaboration Visualization

Source: Data Analysis, 2025

The VOSviewer visualization represents a co-authorship network analysis, mapping influential researchers in the field of green labeling, sustainability, and consumer behavior. The nodes (circles) represent authors, and their size corresponds to the number of publications and citations, while the edges (lines) indicate co-authorship relationships. The three distinct clusters (red, green, and blue) suggest different research communities or schools of thought. The red cluster contains well-known scholars such as Ajzen, Stern, Hair, and Sarstedt, indicating a strong foundation in consumer behavior theories, sustainability psychology, and structural equation modeling. The green cluster features predominantly Asian researchers, such as Wang, Zhang, Liu, and Chen, suggesting a growing body of research from China and East Asia, likely focusing on green consumption, environmental economics, and corporate sustainability. The blue cluster is much smaller, indicating a bridge between these two major groups, possibly representing interdisciplinary work. The network structure highlights the division of research approaches while also showing

key connections that facilitate knowledge integration across disciplines.

## Discussion

### 1. The Evolving Research Landscape of Green Labeling

The bibliometric network analysis reveals a well-established research foundation on sustainability, green marketing, consumer behavior, and perceived value. The keyword co-occurrence map highlights the interdisciplinary nature of green labeling research, as it integrates marketing, environmental science, psychology, and business strategy. The strongest co-occurring keywords, such as “sustainability,” “consumer behavior,” “green marketing,” “purchase intention,” and “willingness to pay,” confirm that scholars have extensively examined the role of green labeling in influencing consumer decision-making.

A key insight from the temporal analysis is the shift in research focus over time. Earlier studies (pre-2018) concentrated on corporate social responsibility (CSR), environmental impact, and regulatory

frameworks, emphasizing the role of businesses and policymakers in promoting sustainability [3]–[5]. More recent studies (2019–2021) exhibit a stronger focus on consumer-driven sustainability trends, such as perceived value, trust in green labels, and purchase intention [6], [7]. This transition underscores the growing recognition that consumer behavior plays a crucial role in market-driven sustainability initiatives.

The co-authorship network analysis further highlights the geographical dispersion of research efforts. The two major research clusters—one dominated by Western scholars (e.g., Ajzen, Stern, Hair, and Sarstedt) and the other by Asian researchers (e.g., Wang, Zhang, Liu, and Chen)—suggest regional differences in sustainability research. Western studies tend to focus on psychological and behavioral models of green consumption, while Asian research emphasizes supply chain sustainability, corporate sustainability practices, and consumer trust in eco-labels. These distinct but interconnected research domains suggest that cross-regional collaboration could enhance theoretical development and policy formulation.

## **2. The Effectiveness of Green Labeling in Enhancing Consumer Value Perceptions**

One of the most critical findings from the bibliometric analysis is the strong relationship between green labeling and consumer value perceptions. The presence of keywords such as “perceived value,” “willingness to pay,” and “decision-making” highlights the role of green labels in shaping consumer trust and product evaluations. Existing literature suggests that consumers increasingly associate green labels with higher product quality, corporate credibility, and social responsibility. However, the effectiveness of green labeling remains contingent on multiple factors, such as credibility, standardization, and consumer awareness. Studies have shown that highly recognized third-party certifications (e.g., Energy Star, Fair Trade, USDA Organic) significantly enhance perceived value by

reducing information asymmetry and increasing consumer trust. In contrast, self-declared green claims by companies are often met with skepticism, particularly in cases where consumers suspect greenwashing—a deceptive practice where firms exaggerate or fabricate environmental claims. Another key moderating factor is consumer education and awareness. While green labeling is effective for environmentally conscious consumers, its influence diminishes among uninformed or skeptical consumers. The bibliometric results suggest a growing interest in educating consumers about sustainability to improve green label credibility. This highlights the need for more research on how businesses, policymakers, and educators can enhance consumer knowledge and confidence in eco-labels.

## **3. Challenges and Controversies in Green Labeling**

Despite its potential benefits, green labeling is not without its challenges. One of the most widely debated issues is the proliferation of eco-labels, leading to consumer confusion and decision fatigue. The bibliometric network reveals that research on standardization and harmonization of green labeling has been gaining momentum. Some scholars argue that too many competing labels with varying levels of credibility dilute their overall effectiveness. Policymakers and industry leaders must work towards more uniform certification standards to enhance consumer clarity and trust.

Another pressing challenge is the cost barrier associated with green products. While many consumers express a willingness to pay more for eco-labeled products, actual purchasing behavior often does not align with stated preferences due to price sensitivity. The bibliometric trends suggest an increasing focus on cost-benefit analysis and sustainable pricing strategies. Future research should explore economic incentives, subsidies, and production cost reductions to make green products more accessible to a broader consumer base. Lastly, the issue of regulatory enforcement remains a significant concern.

While several certification bodies and government agencies regulate eco-labeling, inconsistencies in enforcement and loopholes in green marketing laws persist. Strengthening regulatory oversight and consumer protection measures is critical to preventing misleading claims and maintaining consumer trust in green labeling systems.

#### **4. Implications for Future Research and Policy**

The bibliometric analysis identifies several research gaps that warrant further investigation. First, while there is extensive literature on green labeling and consumer behavior, there is limited research on cross-cultural variations in consumer responses to green labels. Given the regional differences in sustainability priorities, future studies should adopt comparative approaches to explore how cultural, economic, and institutional factors shape green label effectiveness. Second, digitalization and technology-driven transparency represent an underexplored avenue in green labeling research. Emerging technologies like blockchain, QR codes, and AI-driven verification systems offer new opportunities to enhance eco-label traceability and authenticity. Future research should examine how technology integration can improve consumer confidence and engagement with green labels. From a policy perspective, governments and regulatory

bodies must work towards enhancing the credibility of green certifications through stricter monitoring and enforcement. The introduction of universal labeling standards and clearer consumer guidelines could reduce confusion and increase the perceived reliability of sustainability claims. Furthermore, corporate incentives—such as tax benefits for certified sustainable businesses—could encourage more firms to adopt transparent green practices.

#### **5. CONCLUSION**

The bibliometric analysis confirms that green labeling plays a crucial role in enhancing consumer value perceptions, yet its effectiveness depends on factors such as credibility, standardization, and consumer awareness. While research has made significant progress in understanding consumer behavior towards green-labeled products, challenges like greenwashing, label proliferation, and cost barriers remain unresolved. The study highlights the need for standardized regulations, technological innovations, and cross-cultural research to optimize the effectiveness of green labeling. As sustainability continues to shape global consumer markets, businesses, policymakers, and researchers must collaborate to strengthen green labeling frameworks and drive responsible consumption behaviors.

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