

Eco-labeling in Green Marketing: A Bibliometric Exploration of Consumer Buying Behaviour

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Abstract: The current study is a bibliometric study that will investigate the development and effect of eco-labeling in green marketing, and in particular its contribution to the consumer buying behaviour. The Scopus database was searched to retrieve the data. The analysis will include 67 documents published since 2015 and 2025, which will demonstrate a significant rise in the number of research results since 2022 and the increasing interest of scholars in sustainable consumption and green marketing. The major results indicate that the eco-labeling, sustainable development and consumer behaviour are the prevailing themes within the field and thus, the eco-labeling is a critical aspect of the modern day green marketing approaches. The analysis of citations shows that the highest level was reached in 2020, and it presupposes a better understanding of the field relevance. Co-citation network analysis and thematic cluster analysis indicate the most useful contributors and directions of research, and special focus is put on the psychological and economic forces that influence the green consumer behaviour. Theory and practice implications clearly establish the role of eco-labels in promoting sustainable consumption and the need to have businesses through their green marketing policies capitalize on these labels. The present paper positively adds to a better understanding of the significance of eco-labeling in enhancing sustainability and provides the information on possible directions to conduct further research.

Keywords: Eco-labeling, Green marketing, consumer behaviour, sustainable consumption, bibliometric analysis, Scopus, green marketing strategies.

INTRODUCTION

Sustainable consumer behavior has received much attention in the environmentally sensitive international market, which has resulted in a booming of green marketing efforts. Eco-labeling is also one of the most recognizable tools used in this framework as it is a certification tool used on products that meet the set standards of environmental quality (D'Souza et al., 2007). The eco-labels given generally to products meeting accepted environmental standards provide a concrete measure of sustainability and serve as a marketing statement that the product is environmentally friendly to consumers (Delmas and Grant, 2014). This has led to the eco-labeling becoming one of the key elements of green marketing in deciding the differentiation of products and the consumer purchase decision making.

Consumer perception and behaviour in embracing of eco-labelled products cannot be overemphasized. Empirical research has shown that eco-labels can dramatically change consumer behavior so that they are more willing to purchase products that are compatible with their environmental attitudes (Thøgersen, 2010). However, factors that mediate the consumer behaviour with eco-labelled products are complex and multifaceted and can include aspects of perception, trust in the label, perceived quality, and price sensitivity (Chrysochou et al., 2012). The key issue on the application of eco-labeling in buying

decision-making is of importance to both the companies that are attempting to use sustainability as a competitive edge, and the policy makers that need to promote a more sustainable consumer behavior.

The topicality of research on eco-labeling in the perspective of modern sustainability objectives is especially urgent against the background of the global environmental concerns of climate change, reduction of resources, and loss of biodiversity. Green marketing strategies, in particular, eco-labeling, are becoming increasingly important as governments, organisations, and individuals strive to meet sustainability objectives, promote responsible consumption, and promote demand in the marketplace of products that are environmentally sustainable (Lyon and Montgomery, 2015). To this end therefore eco-labeling is not only a marketing tool but also a crucial component in the world wide shift to a more sustainable economy.

Although the literature on eco-labeling has increased, there are still great gaps in research on its direct effect in consumer purchase behaviour. Although there are studies that have determined eco-labeling in different perspectives such as consumer trust, awareness of the environment and branding of the corporate companies, there is no consensus on the precise factors that mediate consumer decision-making in the area. This gap leads to the necessity to carry out a detailed study of the changing patterns and tendencies

of eco-labeling books with respect to the field of consumer behaviour. A bibliometric analysis, in turn, provides a sound methodology tool to trace the present situation in the research and outline the prominent trends, themes, and research perspectives in the sphere.

Objectives of the Study

The main aims of the research are: (1) to investigate the trends and the themes of eco-labeling literature through a bibliometrical search, revealing major research issues, researchers and shaping forces of the discourse on eco-labeling; (2) to study the effect of eco-labeling on the consumer buying behaviour by researching those factors which influence the consumer perceptions and attitudes and buying behaviour of eco-labelled products over time using bibliometric methods. Through these goals, the research will offer an elaborate overview of the present situation of eco-labeling studies and its consequences to the eco-marketing strategies.

LITERATURE REVIEW

Green marketing can be considered as advertising of the products and services with the focus on their positive effects on the environment. This field covers the implementation of various methods of sustainable production, usage of ecologically friendly packaging, and delivering open information about the environmental impact (Peattie and Crane, 2005). The idea was developed in the 1970s alongside the global environmental concern. At this period of time, organisations started to realise the need to be aligned to the emerging environmental movements and meet the needs of the environmentally conscious consumers (Kotler & Keller, 2016). Green marketing has evolved to be a mainstream practice in the past decades; companies are more and more putting sustainability as part of marketing strategies as a way of enhancing brand image, in line with regulatory requirements, and to gain competitive edge.

Application of Eco-labeling as a Green Marketing tool

Eco-labeling has been identified as one of the key tools in green marketing. It is a sort of certification mechanism that informs consumers that a product or service meets prescribed environmental standards (Delmas & Grant, 2014). Eco-labels being a component of green marketing strategies give a vivid and reliable indication of environmental sustainability which makes it easier to make consumer purchase decisions (D'Souza et al., 2007). In terms of marketing, eco-labels can distinguish similar products in saturated markets through communicating environmental credentials, which can increase consumer confidence and brand loyalty (Montgomery and Lyon, 2015). Eco-labeling initiatives can be also applied as a competitive advantage to firms, as the increasing demand to use green products can be met, and the broader sustainability goals will be achieved (Lyon and Montgomery, 2015).

Eco-labels and their importance in various industries

Eco-labels vary in terms of requirements, certification process and geographical coverage. As a rule, they may be divided into three key categories, including voluntary

labels, mandatory labels, and third-party certifications (Lyon and Montgomery, 2015). Independent organisations or non-governmental organisations bestow voluntary eco-labels and tend to reflect the conformity of a product to sustainability or environmental standards. They are usually the Energy Star certification of energy-saving gadgets and the Fair Trade label of socially responsible goods. Compulsory eco-labels, in contrast, are normally government-imposed types of labels on designated products, e.g. the EU Ecolabel or the USDA Organic Mark. Third-party certifications are provided by organizations that are not affiliated with the manufacturer and are designed to help them realize that products are of high environmental quality, such as a Forest Stewardship Council (FSC) certification in the timber industry (Tanner and Kast, 2017).

Eco-labels have different significance in various industries. Eco-labels in the food industry often focus on organic farming and ethical sourcing, and those in the textile industry like the Global Organic Textile Standard (GOTS) focus on sustainable production and fair labour conditions (Nielsen, 2015). In the automotive industry, such certifications as Green Seal and ULEV (Ultra-Low Emission Vehicle) are used to refer to the low environmental impact and fuel efficiency, and in cosmetics, eco-labels refer to cruelty-free or organic products (Choi et al., 2019).

The influencing Factors on the Consumer Buying Behaviour of Sustainable Products

Consumer buying behaviour is a complex construct that is determined by various determinants especially those related to sustainable products. Some of these influential factors are personal values, environmental awareness, extrinsic pressure like social influence and cultural norms (Grankvist and Biel, 2007). To consumers, both intrinsic and extrinsic motivation, which are personal attitudes and socialisation ideals towards sustainability, influence their purchase decisions of eco-labelled products. It has been shown that consumers that have high environmental concern tend to buy eco-labelled products because of ethical responsibility as well as the intention to act as part of environmental conservation (Thøgersen, 2010).

Price as a marginal cost is also another decisive factor in consumer behaviour in terms of the price premium assigned to eco-labelled items. Although it is observed that sustainable goods are better-liked compared to non-labeled products, consumers are unwilling to spend high prices, particularly when other similar products of the same quality are sold at lower prices (Kumar & Shah, 2015). This is where the conflict between environmental issues and price sensitivity lies and business enterprises are faced with the challenge of promoting sustainability and being competitive in price simultaneously.

Previous research on Eco-labeling and Consumer behaviour

A substantial amount of literature has been done on the effect of eco-labeling on consumer perceptions and consumer behaviour. D'Souza et al. (2007) found that

making purchasing intentions based on eco-labeling practice has a positive effect especially in situations where consumers believe the certification process and understand the environmental gains. Equally, Chrysochou et al. (2012) are able to show that eco-labeling contributes to the positive perspectives towards green products; once again however, the success of eco-labels depends on their credibility and transparency.

On the other hand, Delmas and Grant (2014) emphasized how companies face the issue of greenwashing, where fake claims of environmentally beneficial practices are made, but there is no concrete action to back up the claim, and the consumers have become sceptical and lack confidence in the eco-labels. This detail indicates that the effectiveness of eco-labeling is not limited by the appearance of labels only but the authenticity of eco-labels and the perceived validity of the statements.

Gaps and Challenges in the existing literature

Although present studies provide useful information about the use of eco-labeling in consumer behaviour, there are

still some gaps. To begin with, there has been limited agreement on the role of eco-labeling in making purchase decisions among different segments of consumers. The literature is largely concentrated in the general consumer behaviour with the lack of information regarding the eco-labeling influence over buying behaviour of the defined demographics (e.g., age, income, and level of education). Further, the long term implications of eco-labeling on consumer retention and brand image have not been well studied with majority of the studies being focused on short-term purchase behavior (Thøgersen, 2010).

There is one more important gap related to the cross cultural analysis of eco-labeling. Although research has been conducted to determine eco-labeling in Western markets, there is little research done to assess the acceptance of eco-labels in emerging economies where the awareness of the consumer to the environmental issues might be uneven (Nielsen, 2015). These differences between cultures should be further examined to learn how effectively eco-labeling can be used as a green marketing tool in the world.

METHODOLOGY

The study design adopted in this research is a bibliometric one in that it will question the academic discourse on the issue of eco labelling in the green marketing field and its effect on consumer buying behavior. Bibliometric analysis provides a stringent quantitative description of the research domains, permitting to map out intellectual, social and conceptual framework, using data on publications and citation.

Data source and retrieval strategy

The main database used is Scopus. The query used is the retrieval query:

“TITLE-ABS-KEY (eco-labeling AND green AND marketing) AND PUBYEAR > 2014 AND PUBYEAR < 2026”

This query will ensure that the papers with the title, abstract, or keywords that include the word eco labeling or green or marketing are included and will be limited to the publications published between 2015 and 2025. A single run of the query is performed in order to maintain temporal consistency among the data.

Inclusion and exclusion criteria.

Inclusion criteria:
<ul style="list-style-type: none"> • Types of documents: journal articles and review articles, thus quality which is peer reviewed. • Language: English. • Published not earlier than 2015.
Exclusion criteria:
<ul style="list-style-type: none"> • Non-English publications. • The types of document like editorial, letters, conference proceedings unless indexed like an article, book chapter or errata. • Duplicates of records, such as one and the same article in more than one version.

Information cleaning and preparation.

After the bibliographic metadata, consisting of authors, title, year, source title, keywords, affiliations, citations and references are downloaded, the following processes are followed:

- a) Elimination of redundant records.
- b) Unity of authors using disambiguation policies.
- c) Standardization of institutional names and countries of belonging.
- d) Imputation of missing metadata fields (e.g. keywords) through manual verification or additional database queries where possible.

Analytical procedures

Performance analysis and scientific mapping were utilized in this study to investigate the research ground in eco-labeling in green marketing. The analysis of performance focused on descriptive bibliometrics, which implies the investigation of the trends in publications, metrics in citation, and understanding the journals, and institutional players who have a major impact. This helped to evaluate the longitudinal development of the field, the most dominant players, the decentralization of research in various sources, and citation analysis brought even greater understanding of the influence and the coverage of classic works in

the field.

To perform scientific mapping, co-authorship network building, key-word co-occurrence analysis, and bibliographic coupling methodologies were implemented to visualise the relationship between scholars, thematic strands and core concepts. The co-authorship net-work analysis helped to define the clusters of collaborators, as well as the key contributors, but the keyword co-occurrence analysis helped to see the dominant themes and how they developed over time.

These mapping methods thus enabled the production of core and developing research issues, giving a holistic presentation of intellectual framework of the eco-labeling and green marketing academic domain. Visualisations and cluster analyses were created with the use of such instrumentations like VOS viewer and Cite Space and provided a clear, data-driven picture of what was happening in the field. Visualizations in the form of network maps, cluster maps and timeline views are created using software like VOSviewer and R package bibliometrix, and the clusters can also be analysed using cluster analysis of themes and actors.

Reliability, validity and limitations.

The reliability is enhanced with the help of the well-known database (Scopus) and the detailed documentation of the details of queries and data processing steps to support the possibility of reproducing the results.

The validity is guaranteed by the use of rigorous inclusion/exclusion criteria and careful metadata cleaning, thus reducing the errors in authorship and affiliation information.

The study is limited to literature that has been indexed in Scopus, which might not cover non-indexed sources (books, non-English articles). The number of citations is an indicator of impact over time and could be skewed towards older publications because of the citation window effect. The results of networks and clusters are subjective to threshold values and algorithms, making results subjective.

RESULTS AND ANALYSIS

This part identifies the results of the bibliometric review on studies related to eco-labeling in green marketing, and its effects on consumer buying behavior. It is a critical factor in mapping the academic landscape, locating developmental patterns, describing key players, and following thematic change over the field. Accomplishing the task of analyzing systematically publication tendencies, citation patterns, and the structure of scholarly network, the section provides a comprehensive overview of the intellectual production of the field related to eco-labeling in green marketing. The findings also highlight the volume and impact of the publications on time periods, the research clusters that have solidified, and the themes that define the modern body of knowledge. By use of visualizations and quantitative analysis, the results reveal not only the developmental pattern of eco-labeling scholarship but also its intersection with theories and praxis of consumer behavior in general. The section aims at creating the empirical basis on which future consideration of the green marketing approaches and sustainable consumer behavior can be built.

Table-1: Summary of Data Set

Metric	Value
Timespan	2015:2025
Sources	47
Documents	67
Authors	291
Authors of Single-Authored Docs	0
International Co-Authorship	34.33%
Co-Authors per Document	6.51
Annual Growth Rate	23.11%
Author's Keywords (DE)	225
References	601
Document Average Age	3.03
Average Citations per Document	23.22

Source: Authors own compilation

Publication trend analysis

The figure (*Figure-1*), shows a gradual but insignificant increase of scholarly works on eco-labeling in green marketing. First, the number of articles is still small with certain fluctuation that indicates emerging interest in the field. However, starting in 2022, one can observe a strong increase in the volume of research, which is associated with an impressive increase in the scope of investigation on the topic of eco-labeling and its impact on consumer purchasing behavior. This swift rise is in line with the rising interest in the world about sustainability, environmental responsibility, and how businesses play a critical role in supporting green patterns of consumption.

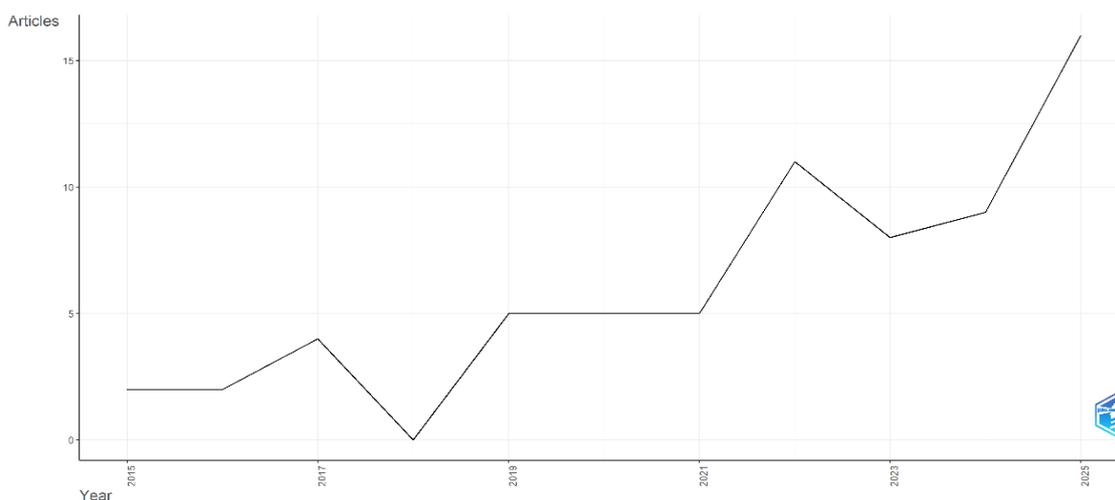


Figure-1: Publication trend

Source: Authors own compilation Using Bibliometric-R studio

The positive growth trend in publications implies that eco-labeling has attracted much academic interest as it tends to expand its relevance in both green marketing strategies and consumer decision-making. The focus on the environmental issues and the general shift to sustainable business practices would have probably caused the recent increase in the intensity of research. Given that eco-labeling takes a central stage in the green marketing debate, this paradigm highlights the importance of an ongoing scholarly research to explain the dynamic role of eco-labeling in consumer behavior and in informing marketing practices.

Citations trend Analysis

The graph (Figure-2), showing the Average number of citations per year 2015 to 2025 indicates a low baseline in citation but the increment around the year 2017 is moderate. The sharp peak is noticed in 2020 as it reaches its highest point. This growth can probably be related to the growing prominence and applicability of eco-labeling studies in the green marketing scenario, as the world grew more concerned with sustainability concerns around the time. The strong increase can be associated with the influence of the seminal articles or new trends that generated a lot of academic and practical attention.

The average number of citations per annum decreases drastically after the 2020 peak, which means that although the interest in the topic was at a peak during the given period, the long-lasting impact of the research started to level out. This trend could be reflective of the fact that most articles that were published during this period have already reached their citation potential, and more recent contributions have not attained an equivalent effect. Although the citation trend decreased subsequently, the citation trend highlights a decisive turning point in the development of the field, as the increased scholarly attention to the phenomenon of eco-labeling is observed around 2020, a time when the topic of environmental sustainability has become increasingly popular.

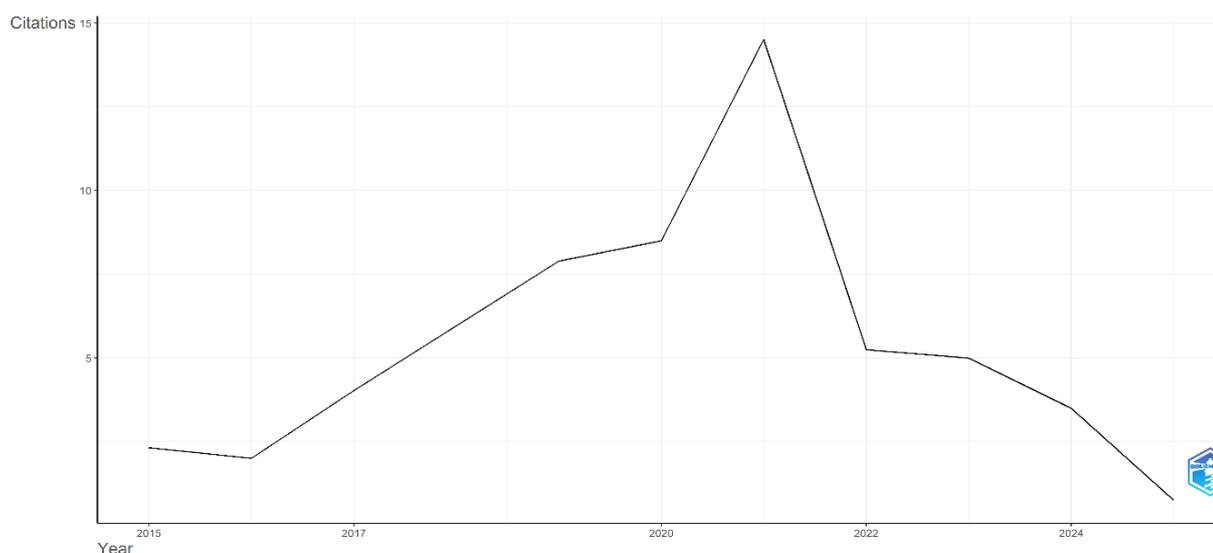


Figure-2: Average number of citations trend

Source: Authors own compilation Using Bibliometric-R studio

Most Relevant Sources

The Figure-3, can be used to indicate those journals that have published the most articles that can be connected with eco-

labeling in green marketing. The journal *Sustainability* (Switzerland) comes out as the leading source with five publications, and the next in line is the journal of *Applied Bioanalysis* with two publications, and *Journal of Cleaner Production* with two publications. Other journals such as *Advances in African Economic, Social and Political*, *Amfiteatru Economic*, *Aquaculture International* and *Asiapacific Journal of Regional Science* each provided a single article.

The findings of this work shed light on the focal eminence of journals focused on sustainability, consumer behavior and environmental science in the propagation of research on eco labels. The fact that the most popular source is the one titled *Sustainability* (Switzerland) indicates its specific power in the publication of the latest studies in the field of green marketing practices, particularly, eco-labeling. The fact that contributions to these outlets were also made by interdisciplinary nature of eco-labeling studies, combining the views of environmental science, business strategy and consumer research. This varied journal coverage also indicates that there was an abundant scholarly interest in the subject matter, and that there were several perspectives on the interconnection of eco-labeling, sustainability, and consumer behavior.

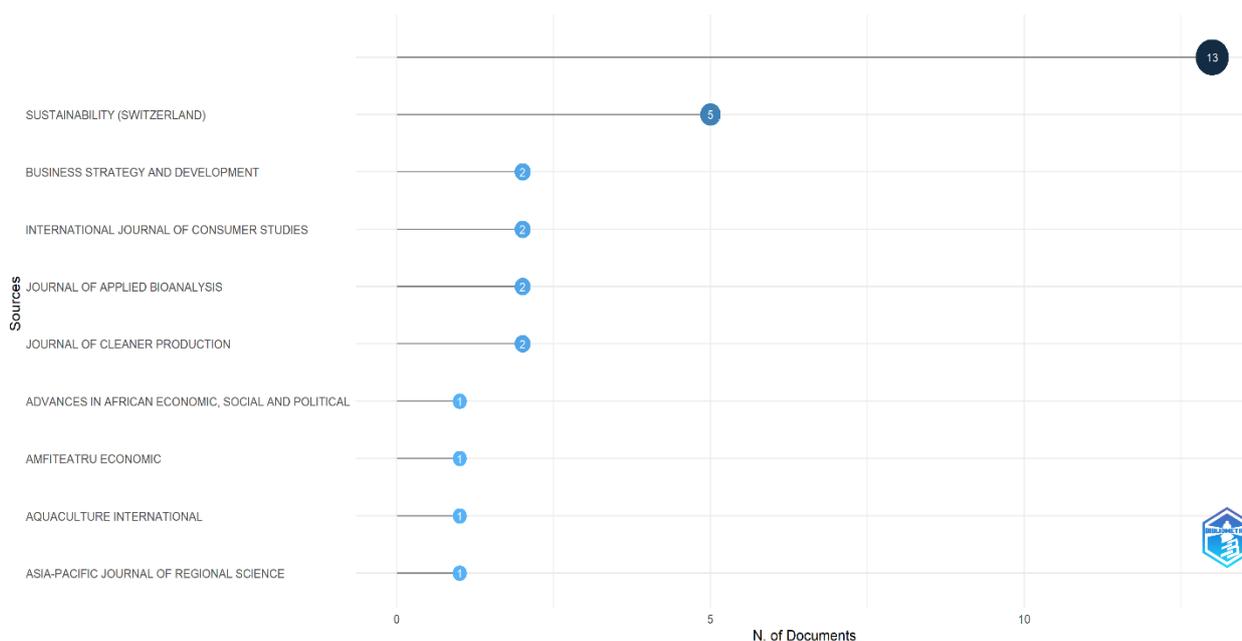


Figure-3: Most influential Source

Source: Authors own compilation Using Bibliometric-R studio

Word Cloud analysis

The word cloud (*Figure-4*), actually provides a graphic representation of the most common words in the literature related to eco-labeling, green marketing and the consumer behavior. The prevalence of the lexemes: green marketing, marketing, eco-labeling, sustainable development, and consumer behavior are accentuations of the central thematic issues of the research corpus. These terms indicate the main focus of the marketing strategies that are based on sustainability, although specific attention is given to the application of eco-labels to shape consumer buying behavior. Other keywords such as sustainability, green economy, consumer behavior, and sustainable consumption define a larger scenario where green marketing overlaps with the environmental issues.

Other major sub-themes discussed through the word cloud include: eco-labels, green products, packaging and corporate social responsibility and this indicates that these areas are important in understanding how eco-labeling functions in green marketing paradigms. The use of such words as regression analysis, sodium chloride, toxicity, and social behavior also illustrate the methodological practices along with the particular topics considered by the studies, therefore, representing the interdisciplinary experiences of the field. Altogether, the visual representation of the word cloud summarizes the major areas of research, which provides an understanding of the shift in the conceptual area of interest of the academic discourse pertaining to eco-labeling, green marketing, and sustainable consumer behavior.



Figure-4: Word Cloud

Source: Authors own compilation Using Bibliometric-R studio

Thematic Map

The Thematic Map (*Figure-5*), shows the visual image of interrelation between specific research topics in the sphere of eco-labeling, green marketing, and consumer behavior. This map will divide into four quadrants on the basis of two dimensions Development Degree (Density) and Relevance Degree (Centrality). The themes are plotted by their density which is the amount of research based on that theme and centrality which is the degree of the control of the theme in the larger research scene. All the quadrants are thoroughly explored in the following paragraphs and the placement of the corresponding themes described.

Motor Themes (Top-Right Quadrant)

The themes of eco-labeling, Sustainable Development and Consumer Behavior fill the Motor Themes quadrant, referring to high centrality and high development density in the field of research. These are the main motives of the literature, the most active and powerful spheres of interest. The dominance of eco-labeling, sustainable development, and consumer behavior are indications that they play central roles in determining green marketing strategies whereby business entities attempt to modify consumer behavior based on environmental friendly activities.

Basic Themes (Top-left quadrant)

Green Marketing, Commerce, and Labels occupy the Basic Themes area which depicts a moderate degree of relevance with a relatively low development density in comparison to motor themes. These constructs are pillars in the field but are not that eminent in research volumes. They dwell upon the broad area of green marketing and trade and the significance of eco-labels in influencing buying patterns. These themes are not as widely discussed yet as the motor themes in modern literature, although they are considered central.

Niche Themes (Bottom-right quadrant)

The Niche Themes quadrant is Environmental Issues and Life Cycle that represents the relative underdevelopment yet have a high level of relevance in the context of the larger research milieu. These topics play a vital role in knowing the environmental impact and life cycle assessment of products that have eco labels in it but these are at the moment in need of the amount of research to begin ascending to the dominant position in green marketing publications.

Emerging or Declining Themes (Bottom-left quadrant)

The Emerging or Declining Themes is filled with Social Media, Perception, and Sustainability. This segment has themes which are either yet to develop substantially or are on the decline. Social Media and Perception are placed at this point, implying that they are still young or are already developed subject-matter, but they have not yet become focal points of green marketing or eco-labeling research yet. Although closely related to green marketing, sustainability can be experiencing a relative decrease of research interest as more particular aspects of sustainability like eco-labeling become predominant.

The thematic map also outlines the history of the eco-labeling and green marketing research with such concepts as eco-labeling, sustainable development and consumer behavior becoming the center of scholarly study. These topics cannot be left out in understanding the interaction between businesses and consumers with the eco-friendly products. The tools of green marketing and eco-labels are the cornerstones, but more about environmental concerns and life-cycle research are in the fringe but are vital in enhancing the insight into sustainability in marketing. The placement of such themes as social media and perception underlines a potential opportunity in the future to conduct the research to explore their potential growing impact on consumer attitude towards eco-labeled products.

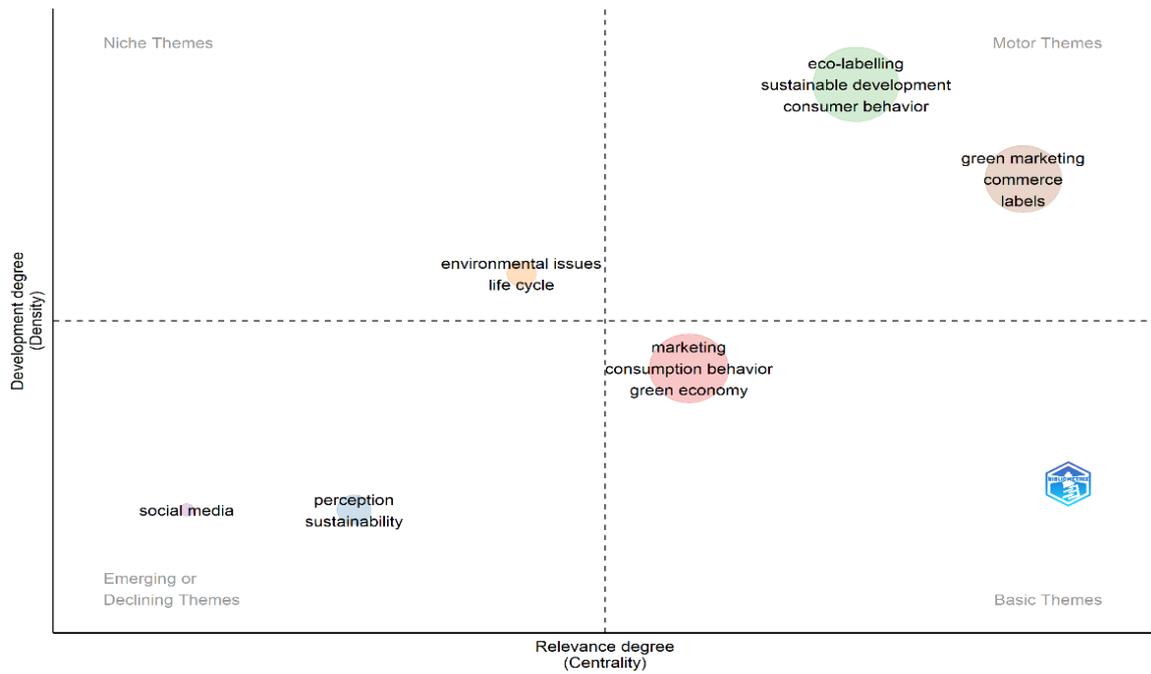


Figure-5: Thematic map

Source: Authors own compilation Using Bibliometric-R studio

Co-citation network

The co-citation network (Figure-6), explains the relationship between the seminal authors in the eco-labeling and green marketing academic field thus highlighting scholarly partnerships and shared base of intellectual support. The key players of the network are the distinguished names like Icek Ajzen and Barbara A. Bickart, whose contribution to the consumer behavior theory and research on eco-labels is significant. The analysis identifies the discrete clusters of research: one of them is anchored to Ajzen and models of consumer behavior, another one is dedicated to Bickart and the effects of eco-labeling on marketing strategies.

Other researchers (Zhen Cai and Esther Calderon-Monge), focus on niche topics like credibility of eco-labels, and hence, correlate consumer behavior to the sustainability in marketing situations. The network also illustrates a growing interest in such areas as the green economy and eco-label credibility, thus emphasizing the interdisciplinary nature of eco-labeling studies that integrates consumer psychology, sustainability and marketing.

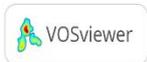
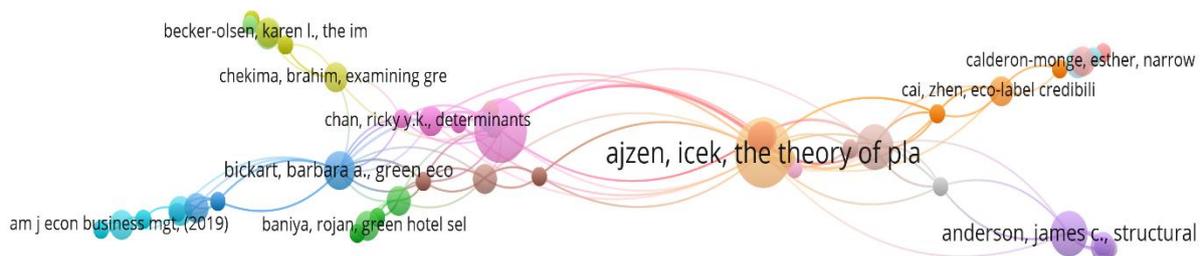


Figure-6: Co-citation network

Source: Authors own compilation Using VOSviewer

DISCUSSION

The bibliometric review of eco-labeling in green marketing identifies the important tendencies in the field, highlighting its increasing topicality as a subject of scientific exploration and practical use in the industry. The intensive increase in academic production since 2022 is a testimony to the rise of eco-labeling as a research topic as a consequence of a global call to sustainability. This burst conforms to the broader environmentalist trends, whereby eco-labeling is being seen as a critical tool of influencing consumer behaviour, and developing environmentally-friendly consumption. The slower increase of publications since 2018 is an indication of the eco-labeling becoming a dominated research field, drawing interdisciplinary academic interest in the fields of marketing, sustainability, and consumer behaviour.

The reference list also highlights the growing awareness of eco-labeling studies. The fact that citations increased in the period of 2020 suggests that the research conducted in this period contributed to the field significantly and improved theoretical understanding of the psychological processes that lead to consumer decision-making. The latter reduction in the number of citations indicates a change in direction of more specialised and more fined-grained lines of inquiry into green marketing and eco-label efficacy, indicating that less exploratory research was done but rather detailed analyses of single aspects of eco-label efficacy. Though such a drop could be viewed to refer to a decreased influence, it does reflect on a continued sophistication of the research agenda, and a more in-depth investigation of the role of eco-labels to influence consumer perceptions and buying behaviour.

The bibliometric evaluation also presents major sources and journals that propagate research on eco-labeling in green marketing. The publication that comes out as the dominant journal is sustainability (Switzerland), which regularly features research on sustainable business practices and eco-labeling. Such dominance is a sign of the increasingly interdisciplinary nature of the discipline, in which the eco-labeling field intersects with marketing theory, consumer psychology, and environmental science. The various scholarly interests in eco-labeling research are also demonstrated in other periodicals in the business and sustainability fields like Business Strategy and Development and the International Journal of Consumer Studies. The diversity of the sources highlights the widening of the perspectives on the issue of eco-labeling, which makes it even more important within the frames of environmental and business environment.

The analysis of thematic evolution has shown that the eco-labeling concept, the idea of sustainable development, and consumer behaviour have become major topics of green marketing. These are some of the themes being developed at a fast pace and are becoming central to the understanding of the role of the eco-label in affecting consumer behaviour and the prospects of implementing sustainability into the marketing strategies. The emergence of the themes of green economy and green marketing in the motor themes quadrant supports the critical position of sustainability in the development of corporate practice. On the other hand, other themes in the declining or emerging quadrant include social media and image meaning an impending convergence between eco-labeling and digital marketing. This trend implies that the future studies are supposed to examine the suitability of social media in the eco-labeling performance, which implicates its increasing power during the digital era. The thematic mapping can be seen as the focus on the dynamic nature of the area and the identification of new directions of research, especially relating to the effects of online platforms on the visibility of eco-labels and customer interaction.

All in all, the bibliometric analysis provides valuable information about the intellectual trend of the eco-labeling studies and its application. The increasing popularity of eco-labeling highlights the need of companies to implement eco-labeling strategies in the context of the general sustainability plans. There is, then, a strong need to understand the psychology of eco-label effectiveness to consumer behaviour (combining behavioural economics, environmental psychology, and marketing) in a future study. In a pragmatic perspective, organisations need to focus on maximising the increase of the eco label credibility and consumer awareness by making sure that the labels are clear and reliable. In that way, businesses will be able to strengthen customer confidence, develop brand loyalty and meet the growing demand of sustainable products. The findings add to a better comprehension of the role played by eco-labeling in facilitating sustainable consumer behaviour but also a good indicator to scholars and practitioners aiming at integrating sustainability in marketing practices.

CONCLUSION

The presented study provides a summative bibliometric synthesis of the research scenario with respect to the topic of eco-labeling in the context of green marketing and its implications on consumer buying behaviour. The empirical evidence highlights the fast growth of the field, outlines the main thematic groups of the field, and names the main authors and sources that influence the research agenda. Together, the findings support the view that eco-labeling is a central component of green marketing models and provide significant information on the dynamic nexus of sustainability, consumer behaviour and organisational practice. Because the field remains in its infancy, future studies should examine the processes and situational factors within psychology that support the usefulness of

eco-labeling in influencing sustainable consumer behavior.

Future Research Directions

The next step that needs to be undertaken by further research into the topic of eco-labeling in green marketing is a study of the psychological and contextual forces that contribute to the consumer reaction to eco-celebrated products. Specifically, research can examine the influence of individual differences on perceptions of eco-label credibility and sustainability claims, e.g. environmental consciousness, socio-demographic factors, and cognitive biases. Besides, it is important to study how the use of digital platforms and social media can enhance the visibility of eco-labels, as the role of online commerce and the influence of social media marketing on decision making

processes are gaining increasing significance. Cross-comparisons between various geographic areas may help understand the role of cultural and economic aspects that moderate mediating the effectiveness of eco-labeling. Moreover, a study of the long-term consequences of the loyalty to brands and consumer confidence and buying behaviour in diverse sectors may further clarify the potential of eco-labels as a marketing tool that can be used as sustainable. Lastly, incorporating eco-labeling among other models of the circular economy and corporate social responsibility offers new prospects of developing green marketing scholarship.

Practical Implications

As a practitioner, organisations are advised to focus on improving the credibility of their eco -labels to provide a sense of resonance among the more environmentally conscious consumer segments. Increasing the level of transparency in labeling, as well as impressive third-party certification programs, will be effective in building consumer confidence and strengthening brand loyalty. The educators of consumers on the importance of eco-labels and the environmental consequences of their buying decisions should become one of the priorities of marketers because awareness is one of the most important antecedents of green consumption. Moreover, companies ought to integrate eco-labeling with a wider green marketing strategy so that they can align it with other green endeavors to create a consistent and compelling brand story. With the growing need to adopt sustainable products, organisations should continuously be innovative and change their marketing strategies to remain competitive in the dynamic market.

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