RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Environmental Label Features and their Theoretical Implications for Sustainability Market Practices towards a Circular Economy

Karolina Crespi Gomes (karolcrespi@gmail.com)
Universidade do Vale do Itajaí - UNIVALI

Gabriela Almeida Marcon Nora (gabriela@almeidamarcon.com)
Universidade do Vale do Itajaí - UNIVALI

Cristiana Rennó D'Oliveira Andrade (cristianarennodoliveiraandrade@gmail.com)
Universidade do Vale do Itajaí - UNIVALI

Anete Alberton (anete@univali.br)
Universidade do Vale do Itajaí - UNIVALI

Franciane Reinert Lyra (francianel@univali.br)
Universidade do Vale do Itajaí - UNIVALI

DOI: 10.18226/25253824.v6.n11.08

Submitted on: 04/02/2022 Revised on: 08/07/2022 Accepted on: 08/22/2022

Abstract: Waste management has undergone many changes since the end of the 20th century therefore, green products have gained increasing attention. This paper aims to understand the association between the use of labels to communicate a sustainable image by green marketing and their impact on consumer perception. Qualitative research was carried out, with a theoretical and empirical nature. No studies were identified analyzing the relationship between the communication of green marketing, aimed at the circular economy, by the environmental labeling perspective, being this groundedness the main contribution for studies improvement in the research field. Then, a sample of 60 product packages in 15 segments and 50 different brands was used. We found that the way the manufacturer seeks to communicate about the potential for reuse or recycling of the material used in the packaging can generate doubt in the consumer. Results demonstrate that no standard symbology is used in environmental labeling. Purchasing decisions would be influenced by information on environmental or ethical aspects of products. Studying how the industry labels its products and offers them to the consumer is certainly a way to understand the degree of maturity and how much progress can be made in terms of consumption and sustainable production. There is still a low relationship between the explored theories and their effective use in environmental labeling, so it is suggested to deepen this gap in future works. Although there is research on environmental labeling, few seek to identify in the field how the concepts and standards have been effectively applied. This study demonstrates that it is still necessary to advance both in terms of consumer understanding of what the labels say, and in aspects of standardization of labels by the industry.

Keywords: Circular Economy, Environmental labeling, Sustainable development

Resumo: *A gestão de resíduos passou por muitas mudanças desde o final do século 20, portanto, os produtos verdes têm ganhado cada vez mais atenção. Este trabalho tem como objetivo compreender a associação entre o uso de rótulos para comunicar uma imagem sustentável pelo marketing verde e seu impacto na percepção do consumidor. Foi realizada pesquisa qualitativa, de natureza teórica e empírica. A análise da relação entre a comunicação do marketing verde, voltada para a economia circular, pela perspectiva da rotulagem ambiental é a principal contribuição para a área de pesquisa. Em seguida, foi utilizada uma amostra de 60 embalagens de produtos em 15 segmentos e 50 marcas diferentes. Constata-se que a forma como o fabricante busca comunicar sobre o potencial de reutilização ou reciclagem do material utilizado na embalagem pode gerar dúvida no consumidor. Os resultados demonstram que nenhuma simbologia padrão é usada na rotulagem ambiental. As decisões de compra seriam influenciadas por informações sobre aspectos ambientais ou éticos dos produtos. Estudar como a indústria rotula seus produtos e os oferece ao consumidor certamente é uma forma de entender o grau de maturidade e o quanto se pode avançar em termos de consumo e produção sustentável. Ainda há uma baixa relação entre as teorias exploradas e seu uso efetivo na rotulagem ambiental, por isso sugere-se aprofundar essa lacuna em trabalhos futuros. Embora existam pesquisas sobre rotulagem ambiental, poucas buscam identificar em campo como os conceitos e normas têm sido efetivamente aplicados. Este estudo demonstra que ainda é necessário avançar tanto no entendimento do consumidor sobre o que os rótulos dizem, quanto nos aspectos de padronização dos rótulos pela indústria*

Palavras-Chave: *Economia Circular, Rotulagem Ambiental, Desenvolvimento Sustentável*

1. Introduction

Waste management has undergone many changes since the end of the 20th century; therefore, green products have gained increasing attention. These changes include a crucial role in public policy, demanding a strategic planning position from governments. The UN 2030 Agenda brings 17 objectives for sustainable development (SDGs), based on 169 targets, including concerns about sustainable production and consumption. According to Yang [1], in recent years, consumers pay more attention to products that are environmental and socially responsible; such products can be called "green products". These are mostly designed or manufactured in a way that minimizes the environmental impact involved in their production, distribution, and consumption. Its design, development, and offer in the market may involve the use of recyclable or recycled materials, biodegradable, and low impact on the environment, whether by the reduced use of energy, carbon, or water. Moreover, Dórea et al. [2] indicate an increase in the theoretical conception and application of environmental labeling worldwide.

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

The concept of the triple bottom line corresponds to the results of an organization measured in social, environmental, and economic terms [3]. Green marketing is a strategy focused on the selling products process and services based on their benefits to the environment. According to Ribeiro, Corrêa, and Souza [4] the green marketing theme evolution in articles published in recognized scientific journals, in the period from 1992 to 2011 in Brazil, leads to conclude that the theme, at the national level, has not reached its maturity, being poignant the need for discussion of this subject, because Brazil is a signatory to the 2030 Agenda. The circular economy brings a new management paradigm mainly by proposing no longer the unbridled extraction of resources to produce products and services [5]. Society would transpose the traditional linear model of production and consumption to make use of reuse and recycling in a systematic way to justify its economic viability in various production environments.

For the Brazilian Institute of Nature Defense [6] sustainable labels are a source of communication for green marketing. This differentiation will attest to the consumer society and the good practices exercised in the production and distribution of the good that uses it on its label. There are still disagreements about a globally accepted labeling standard. The development of reverse logistics is the facet of the circular economy established by the Brazilian Solid Waste Policy, based on Law No. 12,305/2010 [7]. Establishing labeling criteria on waste generation and guiding disposal by consumers is of cardinal importance for environmental management. The diversity of signs and lack of norms defined for their employment might hinder the consumer's information about the correct disposal and would contribute to the collection systems. Also, consumers do not know about the quality of the product before purchasing and one of the main points for this is label failures, resulting from incomplete or technically inaccurate information, affects their right to choose [8-11].

A label indicating that the labeled brand is more environmentally friendly than consumer product brands that do not contain certain symbology on their labels is often used as a simple way to present complex environmental information to consumers [9]. Through seals on labels, the industry communicates with the consumer public, demonstrating how a product can be discarded, recycled, or reused, for example.

The notion is that reliable environmental information will affect the consumer's choice of brand, contributing to expanding the market share of companies with clean technologies or ecologically correct products. [9,12-14]. Furthermore, it is considered that the concept of a "green" consumer is too simplified and does not capture the real complexity of consumer values, attitudes, and behavior. Some product groups receive a lot of attention in this regard, while others remain in obscurity [15]. Studies show that consumers are not exactly monolithic in their preferences for environmental labeling techniques, so according to customer segments, their preferences may change [13]. Other studies point out that environmental labeling increases sales only if no green product price discount is announced, and they have a greater impact on people with demographics associated with pro-environmental values [14]. In any case, the important thing is that the information is not only persuasive but also accurate and adequate.

This paper aims to understand the theoretical association between the use of labels to communicate a sustainable image by green marketing and its impact on consumer perception, besides how the brands are doing so, and if the established standards are observed. For this, qualitative-quantitative research was carried out, of theoretical-empirical nature. The mixed-method research put on the spot the research problem in which results answered the following question: What standard environmental seal symbology could be used to better inform consumers? A sampling of 60 packages was used to confirm the constructs predicted by the study, which is presented below.

2. Green marketing, circular economy, and environmental labeling

Studies state that the excessive energy demand and increased pollution from population growth would lead to the depletion of natural resources. Sustainable development allows them to meet the current needs, without compromising the capacity of future generations to supply their supplies. Consumption, although sometimes considered an individual choice, is deeply rooted in culture, behaviors, and institutions, influenced by corporate and governmental practices [16].

With increasing awareness of the effects of environmental degradation, green marketing has entered the minds of consumers and corporations around the world. Dias [17] proposes it as a strategy of linking the brand, product, or service to a conscious image and focused on sustainability. To encourage the demand for and the supply of green products that cause less stress on the environment, the practice analyzed by this paper must stimulate the potential for market-driven continuous environmental improvement [17,19]. Companies have been slowly introducing green marketing into their business practices, reducing the impact of energy production, manufacturing, and use on the environment [18].

The increase of "green" products, ecologically correct, with proper disposal, and "green advertising" suggests that companies believe that consumers are willing to pay a higher price for products that do not harm the environment [21,22]. There is no problem with transforming corporate social responsibility into a source of competitive advantage, as long as the labels effectively inform the consumer [9,20-22].

For Polonsky [23], it was created to meet the desires and needs of consumers if the way these desires and needs will be met occurs sustainably about the environment. Besides,

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

initially, the green marketing proposal had two main objectives as recommended:

> Develop products that balance consumer needs, have a viable price and convenience with environmental compatibility; and project a quality tin image including environmental sensitivity as to the attributes of a product and as to the trajectory record of its manufacturer. At that time, there was a debate about the relevance of the use of environmental labeling that expressed this product differentiation for consumers [24].

Churchill Jr. and Peter [25] identified that organizations that practice green marketing often use recycled material in their products or at least cause little or no harm to the environment, also seek to pack their goods in ways that have a less environmental impact. This is closely linked to the practices and principles of the circular economy, which is a radical and disruptive innovation for the introduction of new production systems, consumption, and disposal systems [26-27].

The report *Towards the Circular Economy: Economic and business rationale for an accelerated transition,* dated [28] whose author was Ellen MacArthur, an institute of the Foundation that bears her name. This milestone has brought to the fore the current concept of the circular economy, which replaces the concept of end-of-life with restoration, turns its eyes to the use of renewable energy in various operations, eliminates the use of toxic chemicals that harm potential reuses, and aims to eliminate waste through the superior design of materials, products, systems, and models of companies [28] define the term as:

> An industrial system that is restorative or regenerative by intent and design. It replaces the concept of end-of-life by restoration, changes in the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere and aims at the elimination of waste through the superior design of materials, products, systems, and commercial models.

Yet, in the 1970s, it is perceived that industrialized countries responded politically with the combination of sanitation, environmental protection, and, mainly, commercial recycling and reuse practices, existing modern waste management. The action of the United Nations (UN) contextualizes the phenomenon with its prominent role in the environmental research field Academics, intellectuals, and organizations from various fields have made practical applications by improving and developing the general concept of the circular economy.

The structural transformation of economies is pointed out to achieve the goals set by the SDDs. This is essential for increasing long-term growth rates and ensuring social well-being, with broad empirical support for the notion that investment in productive infrastructure based on the concept of circular economy allows driving innovations and increasing GDP growth in the long term. Brazilian publications on the subject emphasize its importance but are not yet expressive [29-30].

Europe is the most advanced continent in this interest. Since 2015 it has developed the European Union Action Plan for the Circular Economy, which defines ways the transition from a linear economy to a circular economy through legislative proposals. Furthermore, the European Centre of Excellence for the Efficient Use of Resources has been helping small and medium-sized enterprises benefit from business opportunities arising from increased resource efficiency; *Horizon 2020 Programme* for the promotion of industry in the circular economy, providing for funding of more than EUR 650 million; and the creation of a platform, in association with the European Investment Bank and national banks, for circular economy financing.

In Brazil, Law 12,305/2010 [6] defines the National Solid Waste Policy (PNRS), which characterizes reverse logistics as a set of actions, procedures, and resources aiming to enable the collection and refund of solid waste to the business industry, for reuse - in its cycle or other production cycles - or for another environmentally appropriate disposal being directly associated with the circular production cycle.

According to IPEA [31], the environmental labeling mechanism is based on information made available on packaging labels so that consumers can choose to purchase products with less environmental impact compared to competing products available on the market. Historically the first label or environmental seal was established by the German Environmental Agency, the "Blue Angel" (Blau Engel), in the 1970s attesting to products from recycling and those with low clarity. Since 1993, Brazil has had the Environmental Quality Seal of the Brazilian Association of Technical Standards (ABNT) on behalf of the *International Standard Organization - ISO in* the country. The ISO [32] verified by the ABNT standard divided the labeling into three categories described below:

Table 1. Categories of environmental labeling in Brazil.

CATEGORY	CATEGORY DESCRIPTION
Type I	Granted and monitored by an independent third party (third party programs), such as government agencies or internationally recognized institutions – are generally better accepted by the consumer due to greater exemption and reliability. The symbology is audited by ISO14024.
Type II	It specifies the environmental self-declarations requirements, including texts, symbols, and graphics, for products. It also describes selected terms commonly used in environmental statements and provides qualifications for their use. It also describes a general assessment and verification methodology for environmental self-declarations and specific assessment and verification methods for the statements selected in this standard.

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Type III	It is audited by third parties and considers the evaluation of the entire life cycle of the product – life cycle analysis (LCA), also called "cradle to grave" analysis. It does not have standardization to achieve, though, they are the most sophisticated and complex in their implementation because require extensive databases to evaluate the product in all its stages, providing the exact dimension of the impacts they cause. Symbology is audited by ISO 14025.

Source: The authors (2022), based on ABNT.

In sum, the adoption of environmental labeling type II (self-declarations) is mandatory by ISO 14021, so that the best way to handle packaging after use is always clearly indicated. The adoption of type I environmental labeling (green seals) is desirable. Given the conceptualization of the circular economy, the labeling most adherent to this type of production model is type III. Since it is considered the Environmental Declaration of Product (DAP), synthesizing an environmental profile of the product, with standardized information must be guaranteed. This characteristic of information uniformity, which is not yet in fact, would be crucial for the implementation of methodologies for comparison between products within the national territory and abroad [33].

The choice of whether to use Eco-labeling program or the self-declared environmental claims may depend on the nature of the market [19]. Understanding whether to self-declare green or meet the demands of the consumer market for greener products in a certification adoption is a strong point of this article, given the strategically benefits determined by these practices whose empirical determination is described and demonstrated in the following sections.

As for the eminent ineffectiveness of the practice of adopting green seals it is noted that communication has little impact on this vehicle of green marketing due to the lack of normalization [30]. The value perception is still fuzzy for the green catching. A Brazilian experiment deduced that the insertion of written environmental certification, underlying the green seal, proved to be more important as an influencing factor than the seal itself. The clear mention of environmental aspects is a theoretical gap to address and evolve its credibility and managerial function [32].

On the other hand, it is necessary to enlarge comprehensive studies of circular businesses in emerging economies, which are sufficiently capable of identifying peculiarities and seeing them in their entirety, to the point of identifying policy and practical implications [33] as this paper's goal assume.

3. Methodology

Bibliographic research was an initial step of this research [33]. Although the study is not a Systematic Literature Review (SRL), initial research was carried out based on 'some' steps of an SLR [4,26,35], to understand the field of study and provide an overview of the topics. Primarily based on systematic research in the Web of Science (ISI) database, articles published in journals and event annals were selected to support the analyses of this study. The research was carried out using as descriptors "green marketing", "circular economy", "green symbology" and "environmental labeling". The initial search returned 16,183 articles in the initial database, considering papers concerned with CE the base summed up to 1,055 (Figure 1).

Figure 1. Data Base Description.

Horizont of the Study	1945-2022
Results found	1055
Sum of the Times Cited	27546
Average Citations per Item	26,11
h-index	89

Source: The authors (2022).

However, in the process of refining the base and when considering publications of Brazilian origin, this amount decreases to 646 and only 119 results identified a direct relationship with the key terms. Appendix 1 represents the concentration of papers published on green marketing (34,03 %). Environmental labeling or certification (13,74 %) and environmental labeling or certification (6,93 %). The integrated systematic review investigated that a few explored the process, the packaging design of green products (9), and the marketing practices as well as the green supply chain (28) and value (24) implications for CE (10), that is a theoretical gap to discuss.

It is noteworthy that in the period between 2015 and 2022 the number of publications is more evident (an increase of 32 % in 2017, 30 % in 2019 and 18 % in 2021). The results revealed a strong association between green marketing (359) applications (SME - 9; emerging economy – 7; tourism – 7; manufacturing – 6; automotive – 5; ethics – 5; construction – 4; retail – 3) and circular economy regarding management models (56), however, industrial symbology and labeling (20) are not highlighted as important factors for conscious consumption (40) and environmental disposal (certification – 12; green innovation – 12; eco/green strategy – 11; carbon and footprint – 9).

With a transversal horizon, an interpretative paradigm is assumed, to reflect on the practices of using the symbology of green seals in products disposed in supermarkets and wholesalers, mainly cleaning products, personal hygiene, food, and beverages. The analysis of the symbology observed a qualitative approach (visual and content), using the quantitative when necessary to broaden the understanding of the problem. A large Brazilian wholesale network was visited in mid-2018 and a sample of 60 products from 15 segments and 50 different brands was retrieved and collected in the field. The analytical comparison of the existing environmental labeling categories (as determined by the first step of the research) with the effective use in the packages was performed. Data collection, therefore, involved primary and secondary data once Brazil has relevant discussions

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

on environmental management systems in companies to ensure harmony between economic exploration and the environment in Latin America [2]. The first consists of the sampling of empirically verified labels and the secondary ones found in the literature and documents referring to environmental certifications of interest to the research towards circular economy percepts.

Meanwhile an inductive approach Yin [37], we considered a range of products selected from stratified sampling to justify the analysis of the results concerning the symbology used as green seals and their effective and correct communication in the packaging as a managerial contribution to circular economy. The methodological framework can be summed up in Figure 2 [6-38].

This study is classified as applied research because it aims to understand a problem in its practice [39]. According to Yin [35], a case study points to an experience for replication, contrast, elimination of alternative explanations, and extension of theory, and the combination of field analysis with bibliographic and documentary research allows a more comprehensive exploration of the theme and greater theoretical elaboration, through multiple lenses.

Figure 2. The methodological framework of the research.

Paradigm	•Interpretativist
Approach	•Quali-quantitative
Logic	•Inductive
Reserach strategy	•Case study, bibliografic and documental reserachs
Goal Nature	•Exploratory e descritive
Temporal horizon	•Transversal
Data collection	•Primary and Secondary

Source: The authors (2022).

4. Results and discussion

Despite the existing environmental labeling typologies, there is still no certification to ensure that a particular product is aligned with the precepts of the circular economy. Thus, it cannot be affirmed that one or the other of the observed standards perfectly meets, a priori, the purpose of communicating to the consumer the correct disposal or reuse. Thus, in the first place, it was observed whether the packaging contained visual communication that could inform the consumer if there is any kind of concern with the correct destination of that product at the end of its life cycle. The more information there is, the better the consumer will make his decisions at the time of purchase and concerning his attitude towards the environment [40].

From the universe of 60 products, only five products, (beans, steel straw, shampoo, bottle juice, and powdered juice) did not present any type of symbology, either for packaging or the label. At second analysis showed that some symbology was identified, and then data tabulation was made, which concatenates the product, its brand, the packaging material, symbols, or phrases focused on environmental awareness, and, finally, its theoretical typology. Based on the retrieved and tabulated data the amount of environmental labeling typologies presented in table 2, was summarized.

Table 2. Environmental labeling identified in the sample.

Typology	Quantity
Type I	8
Type II	85
Type III	Unidentified

Source: The authors (2022).

Comparing within the theme of the various symbologies used for a product, the most frequent labeling is Green Dot, equally the most often used in Europe, and FSC. The symbology Type I covers the signs Green Dot and FSC, presented in the Brazilian sample research.

Secondary data reinforces that FSC Brazil is represented by the Forest Stewardship Council in the national territory. The councils the institution that certifies the forest certification seal by valuing products originating from responsible forest management. The FSC seal can be considered as a tool to control forest production, which aims to guide the consumer in their purchasing decisions, offering a reliable link between responsible production and consumption of forest products, allowing consumers and companies to make decisions for the benefit of people and the environment. The certification system is not unique in Brazil since there is also reliable forest certification CERFLOR (Brazilian Forest Certification Program). Created in August 2002, CERFLOR follows national criteria and indicators prescribed in the standards elaborated by ABNT and integrated into the Brazilian Compliance Assessment System and INMETRO. This is considered a theoretical gap; there should be an alignment of interests and criteria. Ecolabeling would require tools such as environmental labels and declarations [19].

Also, secondary data presume that Green Dot is a symbol of funding for the organization of recovery, classification, and recycling of sales packaging. This green dot on the packaging means that, for that packaging, a financial contribution has been paid to a qualified national packaging recovery organization. It has the trademark symbol designated by the '®'symbol of the registered and authorized commercial logo. Currently, responsible organizations in about 29 countries are using Green Dot as a funding symbol to fund the organization of the collection, classification, and recovery of used packaging, particularly domestic ones.

As managerial contribution, some awareness should be addressed to this issue once the use of Green Dot may lead to doubts as to its suitability. This is because only a few countries can

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

use it. The observed brands that make use of this seal are Quilmes and Corona, founded in Argentina and Mexico, respectively, which are countries not signatories of The Green Dot. However, those marks were acquired by ABInBev, a merger in which a Belgian company participates. Therefore, the use of the Green Dot is due to this fact, since the marks distributed by the signatories may present the seal in the importing countries even if not participating in the Green Dot.

Confoundingly, most of the packaging analyzed is made of plastic or contains plastic in its composition. The number of Type II environmental labeling is predominant in the sample, with 85 items checked. In between the 85 examples of Type II labeling, 66 were plastic or plastic packaging and other material (e.g., aluminum).

Moreover, the comparison showed that concerning Type I there are eight appearances and for Type III none. This is since Type II labeling is created by self-declaration, that is, the manufacturer does not need to comply with any standard or present any environmental statement of its product or packaging. Therefore, there is greater easiness in implementing purely informative symbology.

Hence it was observed in the self-statement is the wide variety of symbols and messages employed. At times, symbols accompanied by phrases are very useful to explain and encourage consumers to adopt practices of care for the environment. Below are some examples of products found in the survey that use pictograms and phrases that can improve consumer understanding at the time of packaging disposal.

In this case, it is noted that in addition to the stimulus to the referral of the packaging to recycling, there is the identification of the place by color and type of plastic. However, it is liable to doubt, since the dumpsters of the selective collection are segregated only by color and not by the number that indicates the type of plastic, as shown in the image by the number 1 to the center of the triple arrow and may cause confusion in the consumer who was going to discard the packaging.

At times, the symbology is unclear, even contradictory. For example, when they indicate that the packaging is recyclable in writing or by symbology, but at the same time on the label, there is the Pictogram Anti Littering, which encourages the garbage to be thrown in the trash but is for ordinary garbage (not recyclable).

A similar situation occurs when the manufacturer wants to inform you that the pet bottle is recyclable, but its label is not. However, without specifying the condition of each of the plastics, it can also generate doubt, as shown in the refrigerant in previous Figure 2.

As a practitioner's contribution the analysis induces that a better way of informing the consumer is to specify the potential for recycling or reuse of each item of the package, as it was perceived in the Colgate® product, with separate symbols and discrimination of the plastic-type and packaging element for recycling, as shown in Figure 3.

As a theoretical contribution, the analysis recommends that for typology III, it must be better aligned with the precepts of the circular economy. Results corroborates with this recommendation once there was no example of use in the sample.

Thus, this finding infers that this typology is little used by manufacturers. Triangulating the theory with the sample and the secondary data it was found that this situation extends to the majority of labeling of Brazil due to the complexity of obtaining this type of seal [41]. However, attempts were perceived in the field to approach a typology III what reinforces that there is not only a theoretical application but also a management best practices driven evolution.

Finally, concerning the products surveyed, most had Type II labeling, which is natural, and at times the self-declaration was beneficial to the consumer due to the rich amount of information presented. This enhances the value chain and its policy making needs to understand the underlying premises of the sustainability problem in emerging economies contributing to the research field of market dynamics [2]. The correct labeling of those firms is aiming to conserve resources and increase material resource efficiency in production and consumption. This requires alignment between marketing and operations, intervening in all relevant life-cycle stages of products contributing to the evolution of CE [42].

Figure 3. Use of Labels and classification by type

Label Type	Example Image
Use of Green Dot	
Type II labeling (ABNT)	

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Type II labeling with interrelated symbols	
Type II labeling with separate symbols	
Type II labeling with symbols separated by material	
Type II environmental label closest to Type III	

Source: The authors (2019)

Organization values must be attained to statement and sharing across the entire ecosystem [43]. Thus, the disposition and the motivation to protect ecosystems and communities; promoting reuse, recycling, reform and sharing of products and services help eliminate waste. The green orientation towards creating long-term value in an innovative, flexible, resilient, and systematic management provide establishment of practices of inclusion and engagement among stakeholders; and open, clear, and transparent dialogue. In addition to promoting circularity, these values have a strong relationship and synergy with sustainable development.

However, at times this type of symbology was not adequate, resulting in multiple interpretations what was noted by appraisers' perceptions. As a suggestion for CE or ESG practitioners this could be an opportunity to standardize the communication in order to guarantee a sustainable consume as well conscientious management percepts towards CE. Improvements, not only in the production stage but also waste management could appraise better product design stages, as well as raising awareness and knowledge about possible fields of action regarding its implementation [44].

5. Conclusions

The study found that companies do not yet use a standard symbology in environmental labeling. It is inferred that this is partly due to the lack of a specific certification on labeling aimed at the circular economy and, in part, by the lack of knowledge about signs and typologies. Despite this, ISO and ABNT work to create naming standards and images to be used in packaging to communicate various information to the consumer, such as whether the packaging is recyclable or recycled. This paper demonstrates that it is still necessary to advance both in terms of consumer understanding of what the labels say, and in aspects of standardization of labels by the industry.

Scarce and confusing information, disarmed, suggesting a negative effect regarding disposal. There would be no problem in maintaining the use of Type II labeling, and self-declaration if it were clear and objective as to its characteristics and how it should be forwarded at the end of its life cycle in line with the SDDS.

Purchasing decisions can be influenced by information on environmental or ethical aspects of products. Studying how the industry labels its products and offers them to the consumer is certainly a way to understand the degree of maturity and how much progress can be made in terms of consumption and sustainable production. As a recommendation for future research, it is suggested to deepen the relationship between circular economy and environmental labeling, with emphasis on productive and managerial processes, final product, and marketing practices.

References

[1] Yang, Y. C. (2017). Consumer Behavior towards Green Products. Journal of Economics, Business, and Management, 5(4).

[2] Dórea, R. J. D. S., Lopes Silva, D. A., de Almeida Neto, J. A., & Rodrigues, L. B. (2022). Environmental Labeling: An Analysis of the Past 22 Years of Research. Journal of International Consumer Marketing, 34(2), 184-200.

[3] Elkington, J. (1999). Cannibals with Forks: The Triple Bottom Line of 21st Century Business.

[4] Ribeiro, H. C. M., Corrêa, R., Souza, M. T. S. (out.2014/ mar.2015). Marketing Verde: Uma Análise Bibliométrica E Sociométrica Dos Últimos 20 Anos. Revista Gestão e Sustentabilidade Ambiental, Florianópolis, 3(2), 87-112.

[5] Barros, M. C. L., Amato Neto, J. (2011). A study on sustainability common topics in operations management and industrial ecology publication. In European Operations

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Management Association (Euroma) Conference, 18., Cambridge, 2011. Book of abstracts. Cambridge: Universityof Cambridge; EurOMA.

[6] Instituto Brasileiro De Defesa Da Natureza - IBDN. (2017). Selos de Sustentabilidade – Por que levar para minha empresa? http://www.ibdn.org.br/2017/07/12/selos-de-sustentabilidade-porque-levar-para-minha-empresa/ (accessed 15.05.2018).

[7] Brasil. (2010). Lei n. 12.305, de 2 de agosto de 2010. Institui a Política Nacional de Resíduos Sólidos; altera a Lei no 9.605, de 12 de fevereiro de 1998; e dá outras providências. http://www.mma.gov.br/pol%C3%ADtica-de-res%C3%ADduos-s%C3%B3lidos (accessed 15.05.2018).

[8] Cason, T. N., &Gangadharan, L. (2002). Environmental labeling and incomplete consumer information in laboratory markets. Journal of Environmental Economics and Management, 43(1), 113-134.

[9] Bjørner, T. B., Hansen, L. G., & Russell, C. S. (2004). Environmental labeling and consumers' choice—an empirical analysis of the effect of the Nordic Swan. Journal of environmental economics and management, 47(3), 411-434.

[10] Grolleau, G., & Caswell, J. A. (2006). Interaction between food attributes in markets: the case of environmental labeling. Journal of Agricultural and Resource Economics, 471-484.

[11] Boström M., Klintman M. (2008) Introduction: Green Consumerism, Green Labelling?. In: Eco-Standards, Product Labelling, and Green Consumerism. Consumption and Public Life. Palgrave Macmillan, London. https://doi.org/10.1057/9780230584006_1

[12] Stern, P. C. (1999). Information, incentives, and proenvironmental consumer behavior. Journal of Consumer Policy, 22(4), 461-478.

[13] Whitson, D., Ozkaya, H. E., & Roxas, J. (2014). Changes in consumer segments and preferences to green labelling. International Journal of Consumer Studies, 38(5), 458-466.

[14] Schwartz, D., Loewenstein, G., & Agüero-Gaete, L. (2020). Encouraging pro-environmental behavior through green identity labelling. Nature Sustainability, 3(9), 746-752.

[15] Pedersen, E. R., & Neergaard, P. (2006). Caveat emptor–let the buyer beware! Environmental labelling and the limitations of 'green consumerism. Business strategy and the Environment, 15(1), 15-29.

[16] O'rourke, D., Lollo, N. (2015). Transforming Consumption: From Decoupling to Behavior Change, to System Changes for Sustainable Consumption. Annual Review of Environment and Resources, 40(1), 233-259.

[17] Dias, R. (2007). Marketing Ambiental. São Paulo: Editora Atlas.

[18] Tandon, M. S., Sethi, V. (2017). An Analysis of the Determinants of Consumer Purchase Behavior Towards Green FMCG Products. The IUP Journal of Marketing Management, XVI(3).

[19] Lee, K. M., & Stensel, H. D. (1999, February). ISO standards on environmental labels and declarations and its implications on the market. In Proceedings First International Symposium on Environmentally Conscious Design and Inverse Manufacturing, pp. 504-508. IEEE.

[20] Dosi, C., & Moretto, M. (2001). Is ecolabelling a reliable environmental policy measure?. Environmental and Resource Economics, 18(1), 113-127.

[21] Lyon, T. P., & Maxwell, J. W. (2002). 'Voluntary'Approaches to Environmental Regulation: A Survey, in In M. Franzini & A. Nicita (eds.), Economic Institutions and Environmental Policy (Aldershot, Hampshire, UK: Ashgate Publishing Ltd.).

[22] Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. California management review, 54(1), 64-87.

[23] Polonsky, M. J. An Introduction to Green Marketing. Electronic Green Journal, 1.

[24] Ottman, J. A. (1994). Marketing Verde: desafios e Oportunidades para a nova era do Marketing. Ediçãonúmero **1ª ed. São Paulo: Makron Books Ltda.**

[25] Churchill, G. A. Jr., Peter, J. P. (2012). Marketing: criando valor para os clientes. Ediçãonúmero **3ª ed. São Paulo: Saraiva.**

[26] Tukker, A. (2015). Product services for a resource-efficient and circular economy – a review. Journal of Cleaner Production, 97, 76-91.

[27] Chamberlin, L., Boks, C. (2018). Marketing Approaches for a Circular Economy: Using Design Frameworks to Interpret Online Communications. Sustainability, 10(6), 1-27.

[28] Ellen Macarthur Foundation. (2012). Towards the Circular Economy. https://www.ellenmacarthurfoundation.org/pt/publicacoes (accessed 04.06.2018).

[29] Sellitto, M. A. (2018). Assessment of the effectiveness of green practices in the management of two supply chains. Business Process Management Journal, 24(1), 23-48

[30] Junior, S. B., Martínez, M. P., Correa, C. M., Moura-Leite, R. C., Da Silva, D. (2019). Greenwashing effect, attitudes, and beliefs in green consumption. RAUSP Management Journal, 54(2), 226-241.

[31] Instituto De Pesquisa Econômica Aplicada. (2013). IPEA: Boletim regional, urbano e ambiental. http://www.ipea.gov.br/agencia/images/stories/PDFs/boletim_regional/131127_boletimregional7_cap2.pdf (accessed 15.05.2018).

[32] Andreoli, T. P., Lima, V. A., & Prearo, L. C. (2017). A (in) eficácia dos selos verdes sobre o comportamento dos consumidores: um estudo experimental. *Revista Eletrônica de Ciência Administrativa*, *16*(1), 62-79.

[33] Farias, F. G., Pinto, F. R., de Sousa Araújo, D., de Menezes, B. S., & de Andrade, R. D. (2021). Uma Década de Estudos sobre Economia Circular: Tendências e Reflexões Através de Análise Bibliométrica Internacional. Internext, 16(3), 289-305.

[34] Associação Brasileira de Normas Técnicas - ABNT. (2009). Programa ABNT de Rotulagem Ambiental. Brasília, 4 dez. 2009. (Workshop InternacionalsobreRotulagem Ambiental).

[35] Associação Brasileira Da Indústria De Plástico - ABIPLAST. (2016). INMETRO – Programa de Rotulagem Ambiental Tipo III – Declaração Ambiental de Produto (DAP). http://abiplast.org.br/noticias/inmetro--programa-de-rotulagem-ambiental-tipo-iii--declaracao-ambiental-de-produto-dap/20160329154107_J_185 (accessed 20.06.2018).

[36] Webster, J., Watson, R. T. (2002). Analyzing the past to prepare for the future: writing a literature review. Mis Quarterly, 26(2).

[37] Yin, R. K. (2015). Estudo de Caso: Planejamento e métodos. Bookman editora.

[38] Creswell, J. W. (2010). Research design: Qualitative, quantitative, and mixed methods approach. California: Sage Publications.

[39] Miguel, P. A. C. et al. (2012). Metodologia de pesquisa em engenharia de produção e gestão de operações. Ediçãonúmero **2ª ed. Rio de Janeiro: Elsevier.**

[40] Jugend, D., Rojas Luiz, J. V., ChiappettaJabbour, C. J., A Silva, S. L., Lopes De Sousa Jabbour, Salgado, M. H. (2017). Green product development, and product portfolio management: empirical evidence from an emerging economy. Business StrategyandtheEnvironment, 26(8), 1181-1195.

[41] Compromisso Empresarial Para Reciclagem - CEMPRE. (2018). A Rotulagem Ambiental e o Consumidor no Mercado Brasileiro de Embalagens.

[42] Milios, L. (2018). Advancing to a Circular Economy: three essential ingredients for a comprehensive policy mix. Sustainability Science, 13(3), 861-878.

[43] Barboza, L. L., Bertassini, A. C., Gerolamo, M. C., & Ometto, A. R. (2022). VALORES RGANIZACIONAIS COMO SUPORTE PARA A ECONOMIA CIRCULAR E A SUSTENTABILIDADE. *Revista de Administração de Empresas*, *62*.

[44] Kuz, E. L., & Sehnem, S. Circular Economy Mainstream: an Analysis of Master Thesis and Dissertations Mainstream da Economia Circular: uma Análise de Teses e Dissertações de Mestrado.

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Appendix 1 – ISR Data Base

Source Title	Total Citations
JOURNAL OF CLEANER PRODUCTION	2710
JOURNAL OF BUSINESS ETHICS	1283
JOURNAL OF BUSINESS RESEARCH	1269
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	1173
JOURNAL OF RETAILING AND CONSUMER SERVICES	992
INTERNATIONAL JOURNAL OF OPERATIONS & PRODUCTION MANAGEMENT	965
JOURNAL OF MARKETING	826
SUSTAINABILITY	821
MANAGEMENT DECISION	812
INDUSTRIAL MARKETING MANAGEMENT	788
ENERGY POLICY	721
BUSINESS STRATEGY AND THE ENVIRONMENT	580
CALIFORNIA MANAGEMENT REVIEW	579
INTERNATIONAL JOURNAL OF CONTEMPORARY HOSPITALITY MANAGEMENT	559
JOURNAL OF ADVERTISING	545
MANAGEMENT SCIENCE	543
INTERNATIONAL JOURNAL OF CONSUMER STUDIES	493
MARKETING INTELLIGENCE & PLANNING	401
INTERNATIONAL JOURNAL OF HOSPITALITY MANAGEMENT	393
ECOLOGICAL ECONOMICS	379
ENVIRONMENT	319
JOURNAL OF CONSUMER PSYCHOLOGY	302
JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT	301
MIT SLOAN MANAGEMENT REVIEW	288
MACROMOLECULAR BIOSCIENCE	262
OMEGA-INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE	252
EUROPEAN JOURNAL OF MARKETING	242
RENEWABLE & SUSTAINABLE ENERGY REVIEWS	236
JOURNAL OF CONSUMER AFFAIRS	220
INTERNATIONAL MARKETING REVIEW	212
JOURNAL OF CONSUMER RESEARCH	204
BRITISH FOOD JOURNAL	199
JOURNAL OF ENVIRONMENTAL MANAGEMENT	196
JOURNAL OF PUBLIC POLICY & MARKETING	192
TOURISM MANAGEMENT	187
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	185
SUSTAINABLE DEVELOPMENT	167
SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL	149
EXPERT SYSTEMS WITH APPLICATIONS	143
JOURNAL OF SERVICES MARKETING	142
JOURNAL OF ENVIRONMENTAL PSYCHOLOGY	141
FOREST PRODUCTS JOURNAL	140
INTERNATIONAL JOURNAL OF ADVERTISING	134
AMFITEATRU ECONOMIC	123
QUALITY & QUANTITY	123
JOURNAL OF CONSUMER BEHAVIOUR	122
JOURNAL OF BUSINESS & INDUSTRIAL MARKETING	112
JOURNAL OF MACROMARKETING	111
MARKETING THEORY	111
JOURNAL OF STRATEGIC MARKETING	107
JOURNAL OF MARKETING MANAGEMENT	106
CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	105
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	105
INTERNATIONAL JOURNAL OF RESEARCH IN MARKETING	102
JOURNAL OF MANUFACTURING TECHNOLOGY MANAGEMENT	102
JOURNAL OF SUSTAINABLE TOURISM	101

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Source Title	Total Citations
JOURNAL OF CLEANER PRODUCTION	2710
JOURNAL OF BUSINESS ETHICS	1283
JOURNAL OF BUSINESS RESEARCH	1269
JOURNAL OF THE ACADEMY OF MARKETING SCIENCE	1173
JOURNAL OF RETAILING AND CONSUMER SERVICES	992
INTERNATIONAL JOURNAL OF OPERATIONS & PRODUCTION MANAGEMENT	965
JOURNAL OF MARKETING	826
SUSTAINABILITY	821
MANAGEMENT DECISION	812
INDUSTRIAL MARKETING MANAGEMENT	788
ENERGY POLICY	721
BUSINESS STRATEGY AND THE ENVIRONMENT	580
CALIFORNIA MANAGEMENT REVIEW	579
INTERNATIONAL JOURNAL OF CONTEMPORARY HOSPITALITY MANAGEMENT	559
JOURNAL OF ADVERTISING	545
MANAGEMENT SCIENCE	543
INTERNATIONAL JOURNAL OF CONSUMER STUDIES	493
MARKETING INTELLIGENCE & PLANNING	401
INTERNATIONAL JOURNAL OF HOSPITALITY MANAGEMENT	393
ECOLOGICAL ECONOMICS	379
ENVIRONMENT	319
JOURNAL OF CONSUMER PSYCHOLOGY	302
JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT	301
MIT SLOAN MANAGEMENT REVIEW	288
MACROMOLECULAR BIOSCIENCE	262
OMEGA-INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE	252
EUROPEAN JOURNAL OF MARKETING	242
RENEWABLE & SUSTAINABLE ENERGY REVIEWS	236
JOURNAL OF CONSUMER AFFAIRS	220
INTERNATIONAL MARKETING REVIEW	212
JOURNAL OF CONSUMER RESEARCH	204
BRITISH FOOD JOURNAL	199
JOURNAL OF ENVIRONMENTAL MANAGEMENT	196
JOURNAL OF PUBLIC POLICY & MARKETING	192
TOURISM MANAGEMENT	187
INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH	185
SUSTAINABLE DEVELOPMENT	167
SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL	149
EXPERT SYSTEMS WITH APPLICATIONS	143
JOURNAL OF SERVICES MARKETING	142
JOURNAL OF ENVIRONMENTAL PSYCHOLOGY	141
FOREST PRODUCTS JOURNAL	140
INTERNATIONAL JOURNAL OF ADVERTISING	134
AMFITEATRU ECONOMIC	123
QUALITY & QUANTITY	123
JOURNAL OF CONSUMER BEHAVIOUR	122
JOURNAL OF BUSINESS & INDUSTRIAL MARKETING	112
JOURNAL OF MACROMARKETING	111
MARKETING THEORY	111
JOURNAL OF STRATEGIC MARKETING	107
JOURNAL OF MARKETING MANAGEMENT	106
CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT	105
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	105

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Authors	Total Citations
Chen, Yu-Shan; Chang, Ching-Hsun	803
Zhu, QH; Sarkis, J; Geng, Y	731
Paul, Justin; Modi, Ashwin; Patel, Jayesh	610
Chen, Yu-Shan	581
Delmas, Magali A.; Burbano, Vanessa Cuerel	560
Peloza, John; Shang, Jingzhi	503
Luchs, Michael G.; Naylor, Rebecca Walker; Irwin, Julie R.; Raghunathan, Rajagopal	496
Chen, CL	357
Baumann, H; Boons, F; Bragd, A	356
Cronin, J. Joseph, Jr.; Smith, Jeffery S.; Gleim, Mark R.; Ramirez, Edward; Martinez, Jennifer Dawn	325
Roe, B; Teisl, MF; Levy, A; Russell, M	322
Kammerer, Daniel	313
Ottman, Jacquelyn A.; Stafford, Edwin R.; Hartman, Cathy L.	303
SHRUM, LJ; MCCARTY, JA; LOWREY, TM	303
Ginsberg, JM; Bloom, PN	288
Haws, Kelly L.; Winterich, Karen Page; Naylor, Rebecca Walker	287
Rex, Emma; Baumann, Henrikke	271
Pujari, D; Wright, G; Peattie, K	268
Kale, Gaurav; Kijchavengkul, Thitisilp; Auras, Rafael; Rubino, Maria; Selke, Susan E.; Singh, Sher Paul	262
Akehurst, Gary; Afonso, Carolina; Goncalves, Helena Martins	257
Hong, Zhaofu; Guo, Xiaolong	249
Simpson, Dayna; Power, Damien; Samson, Daniel	234
Mohr, LA; Eroglu, D; Ellen, PS	220
Kim, Yong Joong; Njite, David; Hancer, Murat	208
Brough, Aaron R.; Wilkie, James E. B.; Ma, Jingjing; Isaac, Mathew S.; Gal, David	204
Peloza, John; White, Katherine; Shang, Jingzhi	198
Leonidou, Constantinos N.; Katsikeas, Constantine S.; Morgan, Neil A.	196
Bjorner, TB; Hansen, LG; Russell, CS	195
Agrawal, Vishal V.; Ferguson, Mark; Toktay, L. Beril; Thomas, Valerie M.	186
Jaiswal, Deepak; Kant, Rishi	186
Leonidou, Leonidas C.; Leonidou, Constantinos N.; Fotiadis, Thomas A.; Zeriti, Athina	186
Michaud, Celine; Llerena, Daniel	177
Chan, Eric S. W.	173
Sharma, Arun; Iyer, Gopalkrishnan R.; Mehrotra, Anuj; Krishnan, R.	173
Dangelico, Rosa Maria; Vocalelli, Daniele	168
Shang, Kuo-Chung; Lu, Chin-Shan; Li, Shaorui	167
Mostafa, Mohamed M.	165
Choi, Sungchul; Ng, Alex	160
Banerjee, A; Solomon, BD	159
Rafindadi, Abdulkadir Abdulrashid; Ozturk, Ilhan	153
Taufique, Khan Md. Raziuddin; Vaithianathan, Sridhar	151
Rivera-Camino, Jaime	148
Griskevicius, Vladas; Cantu, Stephanie M.; van Vugt, Mark	147
Groening, Christopher; Sarkis, Joseph; Zhu, Qingyun	144
Polonsky, Michael Jay	135
Chang, Hua; Zhang, Lingling; Xie, Guang-Xin	134
Morren, Meike; Grinstein, Amir	132
Goh, See Kwong; Balaji, M. S.	131
Grimmer, Martin; Bingham, Timothy	129
Tseng, Shih-Chang; Hung, Shiu-Wan	127
Mathiyazhagan, K.; Govindan, Kannan; Haq, A. Noorul	126
Zhu, Qinghua; Dou, Yijie; Sarkis, Joseph	126

RICA – v. 6 n. 11, 2022
Revista Interdisciplinar de Ciência Aplicada
ISSN: 2525-3824

Description - ISR categories	Papers	%	Total Citations	%
green marketing	359	34,03%	6469	23,48%
environmental labeling or certification	145	13,74%	3977	14,44%
sustainability	73	6,92%	2356	8,55%
green management	56	5,31%	446	1,62%
green product	47	4,45%	2873	10,43%
green purchase behaviour	45	4,27%	1462	5,31%
green consume	40	3,79%	874	3,17%
green power and electricity	32	3,03%	1040	3,78%
green supply chain	28	2,65%	1867	6,78%
green value	24	2,27%	1054	3,83%
green advertising	22	2,09%	637	2,31%
green labelling	20	1,90%	530	1,92%
greenwashing	16	1,52%	1149	4,17%
hospitality	16	1,52%	189	0,69%
food and organic	13	1,23%	129	0,47%
certification	12	1,14%	133	0,48%
green innovation	12	1,14%	38	0,14%
eco and green strategy	11	1,04%	59	0,21%
circular economy	10	0,95%	43	0,16%
social responsibility	10	0,95%	760	2,76%
carbon and footprint	9	0,85%	165	0,60%
green packaging	9	0,85%	398	1,44%
SME	9	0,85%	26	0,09%
emerging economy	7	0,66%	343	1,25%
tourism	7	0,66%	17	0,06%
manufactirung	6	0,57%	43	0,16%
automotive	5	0,47%	97	0,35%
ethics	5	0,47%	294	1,07%
construction	4	0,38%	5	0,02%
retail	3	0,28%	73	0,27%
Total	**1055**		**27546**	