

## IMPROVING ENVIRONMENTAL COMMUNICATION. OVERVIEW OF DIRECTIONS AND RECOMMENDATIONS

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**Purpose:** The aim was to review the latest research on environmental labels and present directions for improving the communication process resulting from this research.

**Design/methodology/approach:** A library search and systematic literature review were used to achieve the objective. Thematic categorization was performed to group the results into logical sets.

**Findings:** The results of the study made it possible to identify and categorize directions and recommendations for improving and perfecting environmental labelling systems. The analysis identified seven areas requiring improvement and refinement. These are: the scope and rigour of ecolabel standards, the graphic design and presentation of the label, the trustworthiness and credibility of the standard, public policy and incentive instruments for producers, the adaptation of labels to a diverse consumer market, information campaigns and public education, and measures targeting producers and supply chain operators.

**Research limitations/implications:** In order to reduce the limitations of these studies in the future, it is recommended to extend the period of time covered by the studies and to search additional publication databases.

**Practical implications:** The results of this study highlight the need for continuous improvement and refinement of environmental communication systems. An analysis of the latest research in this field has identified many areas where ecolabels could perform even better. The recommendations collected have been grouped into seven thematic areas. The results of the article are a valuable resource for decision-makers and certification bodies, indicating what improvement measures should be implemented.

**Originality/value:** The paper presents an original approach, based on a systematic review of the literature, to identifying, synthesizing and highlighting areas of environmental communication that need to be improved in order to adapt requirements to changing conditions.

**Keywords:** ecolabels, market communication, sustainable development, environment, systematic literature review.

**Category of the paper:** Literature review.

## 1. Introduction

The growing concern and anxiety about the environment observed in developed countries is contributing to increased pressure for the multilevel implementation of sustainable development (Alhamdi, Al-Kahtani, Abdullah, 2024). Climate change and progressive environmental degradation are forcing action toward more responsible consumption patterns and responsible production and business practices (Al-Swidi et al., 2022). At a time of growing concern and anxiety about environmental issues, market-based enterprises in particular should not only monitor their activities and impact on the environment, but above all must take full responsibility for the environmental and social consequences of their operations (Nyamtseren, Feng, Deo, 2018).

Organisations that fail to respect social expectations regarding environmental protection will lose their competitive advantage, both in the local and international markets (Cerciello, Busato, Taddeo, 2022). Understanding this mechanism will very quickly translate into a change in corporate management strategy, which will increasingly focus on implementing sustainable development requirements (Wang, Sueyoshi, 2018).

Research conducted by Xin et al. (2025) indicates that manufacturers should prioritize investments in energy-efficient and green technologies. This approach provides an opportunity to strengthen and consolidate the company's market position in relation to inefficient manufacturers (Xin et al., 2025).

Governments and supranational organisations focus their efforts on shaping and stimulating environmental awareness among consumers. Their goal is to promote and highlight sustainable products and environmental practices in order to encourage their purchase (Alhamdi, Al-Kahtani, Abdullah, 2024). These measures are more effective among people who are aware of climate change and threats and make purchasing decisions based on environmental factors. Their opposites are consumers who are not sensitive and do not pay attention to environmental protection and sustainable development issues (Chen, Shang, Li, 2014).

Certification systems and environmental labels have been introduced to support the pursuit of sustainable development goals. They are tools used to guide choices and encourage market participants to adopt sustainable practices (Ceballos-Santos et al., 2025). These voluntary programs aim, among other things, to raise consumer awareness of environmental issues and allow comparison of products on offer.

Despite the large number of studies, there is a lack of publications that address the subject of environmental communication in a comprehensive and holistic manner. This is a gap that arises from an analysis of the literature on the subject. There are a significant number of studies that focus on individual elements of the communication process. However, there is a lack of a comprehensive analysis and presentation of the latest research and the resulting directions to improve the environmental communication process. Conducting a comprehensive review and

verification of the latest research fills this gap. Research is needed to condense and accumulate the latest knowledge and research achievements related to environmental labels.

To support the achievement of this objective, the research question RQ1 was adopted: What are the directions to improve the environmental communication process? This article consists of an introduction, literature review, methodology, results, discussion, and conclusion.

## 2. Literature review

Ecolabels inform consumers about the environmental impact of a given product. They confirm that the certification process has been completed (Balzarova, 2021). Ecolabels and other forms of environmental information are used to attract consumers' attention and interest (Srinivasan, 2025). Another direction and additional effect is the attempt to make the purchase act fully credible and consistent with the declared properties.

According to Spence's signalling theory describing how companies convey information, consumers face information asymmetry. Ecolabels allow consumers' information expectations to be met. This in turn contributes to the expansion of the market for new customer groups, increased demand, and sales (Bukhari et al., 2025).

The positive effects of the labeling systems implemented are products that appear on the market that do not contain undesirable or harmful ingredients. For example, palm oil, pesticides, GMOs, parabens, etc. (Brécard, Chiroleu-Assouline, 2025). Environmental labeling also allows active reduction of waste and emissions, as well as significant improvement in the efficiency of input resource consumption (Brandi 2017; Ojiako et al., 2024).

Other benefits and implications of the increasingly widespread use of ecolabels include consumer education. Some consumers shape their preferences based on the information on the labels. This applies, for example, to the harmfulness of a given ingredient. Given such experiences, consumers are more aware and willing to pay for certified and labelled products.

This mechanism has been recognised by large retail chains (Reardon et al., 2024). To rapidly increase the sales of eco-labelled products, these entities are increasingly requiring their suppliers to provide larger quantities of certified products (Reardon et al., 2024). Research by Bukhari et al. (2025) on voluntary labelling schemes confirms that their implementation is an important strategy for increasing market competitiveness locally and internationally. These strategies are particularly beneficial in developing economies.

However, not all experiences with environmental labelling systems are always positive. It is difficult to assess the extent to which they fulfil their purpose (Vlaeminck, Vandoren, Vranken, 2014). Problems in performing a full and comprehensive impact analysis stem from insufficient data, a lack of standardised documentation, and limited access due to confidentiality rights (Balzarova, Cohen, 2020). Another problem is the destabilisation of the environmental

labelling system due to so-called ‘greenwashing’ and misleading labelling. This poses a threat due to the atmosphere of uncertainty, anxiety, and misunderstanding among consumers.

Another weakness of eco-labelling is that the vast majority of ecolabels only verify one-dimensional standards and requirements that mainly focus on environmental aspects. Considering the pillars of sustainable development, which are the environment, the economy, and society, the prevailing approach is strongly and disproportionately focused on environmental aspects (Wognum et al., 2011). Undoubtedly, the full implementation of sustainable development principles cannot ignore economic and social aspects.

To better complement all aspects of sustainable development, eco-labelling should take the form of a vertically integrated, multidimensional framework that evenly combines environmental, social, and economic aspects (Chandan et al., 2025). This approach will provide the best guarantee for building consumer confidence, promoting the circular economy as the best form of rational and sustainable use of resources, and minimising waste.

### **3. Methodology**

A library search was conducted to achieve the research objective. A systematic literature review methodology was used to examine the directions to improve environmental labelling systems. The search criteria were selected based on defined criteria to achieve the research objective. The search was conducted in a structured manner. It was based on sources from the Scopus database, using the keyword ‘ecolabel’. This term was searched for in the title, abstract, or keywords of peer-reviewed publications.

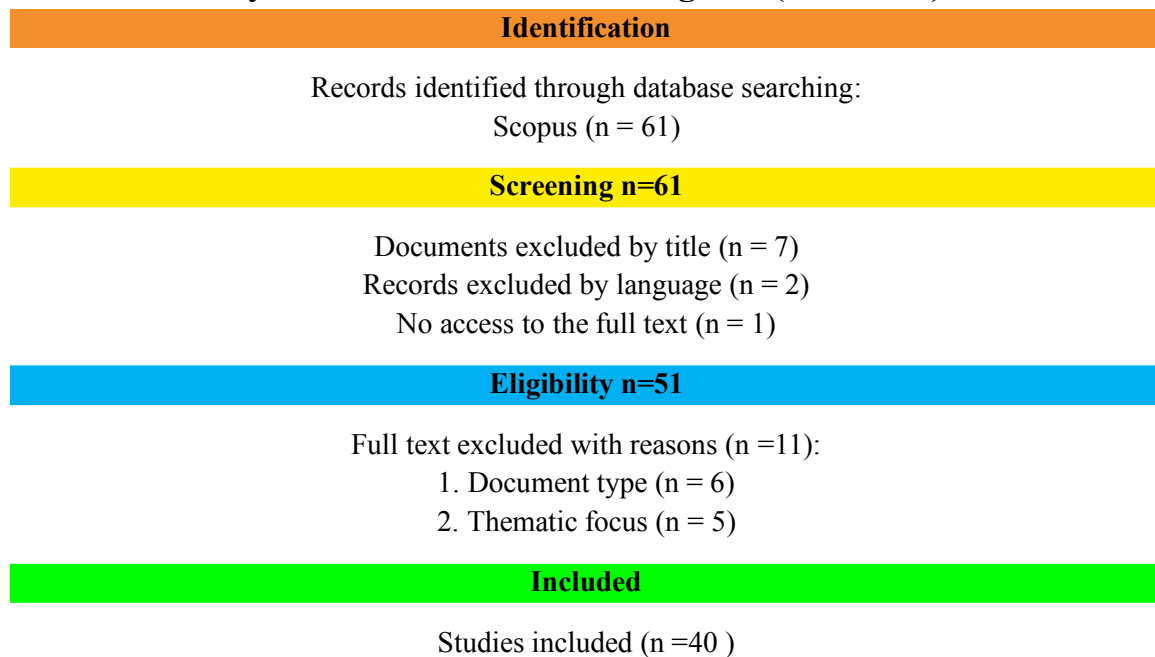
Due to the need to keep the topic highly topical and the high probability of obtaining a very large number of results, the search was limited to scientific articles published in 2024 and 2025. This also ensured that the sources were of great relevance. The study focused on such a short period of time to capture the most recent and current trends. This approach allowed us to avoid outdated articles.

In order to select data obtained from the Scopus database, a multistage verification process was used to ensure that the results were consistent with the objective of the study. The selection of articles was based on the methodology and guidelines of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Moher et al., 2009). Both authors carefully reviewed publications that met the review criteria to remove those that did not fit the scope and purpose of the study. Given the large number of publications on eco-labelling, a horizontal approach was taken to identify areas for improvement in labelling, focusing mainly on solutions with a wide scope and applicability. The database was searched and the publications reviewed between October and November 2025. The exclusion criteria defined and adopted in this review were taken into account:

- language (only publications in English were included),
- type of document (only peer-reviewed research publications, excluding review papers),
- the subject area (only if the main topic was environmental labelling and ecolabels).

Only manuscripts that met all of the above criteria were considered eligible and included in the review. Therefore, the criteria for selecting the literature should be considered to meet the conditions of a systematic, repeatable, and transparent research procedure. The procedure used is presented in Figure 1.

### **Systematic Review Flow Diagram (PRISMA)**



**Figure 1.** The procedure used to select manuscripts.

Source: own study based on (Moher et al., 2009).

A total of 61 articles were identified, including 6 review articles, 2 without an English version, and 1 without access to the full version. A multistage source selection process was used in accordance with the accepted review principles and research objectives. Finally, 40 articles were selected to serve as source material for this study.

After analysing the research articles relevant to the objective of the study, evaluating and assimilating the data, the most important conclusions are presented below.

## **4. Results**

The narrative literature review allowed us to select trends in eco-labelling and environmental communication improvement from the latest scientific literature. From among the areas identified in the course of scientific research, suggestions for their improvement were

formulated and grouped into several more general categories. For this purpose, thematic categorisation was carried out to group the research results into logical sets (Braun, Clarke, 2022). The analytical categories created concern recommendations for improving and enhancing eco-labelling systems in the following areas:

- the scope and rigour of ecolabel standards,
- the graphic design and presentation of the label,
- the trustworthiness and credibility of the standard,
- public policy and incentive instruments for producers,
- adaptation of labels to a diverse consumer market,
- information campaigns and public education,
- actions towards producers and supply chain entities.

The first of the analytical categories refers to the requirements imposed on entities applying for certification, the completeness of the environmental impact assessments, and the degree of standardisation of the labelling system. These recommendations, which are the result of scientific research, propose that the certification system should be based on more stringent requirements, even at the cost of fewer companies being able to meet them (Zhao, Dunan, 2025; Cadrin, Nakatsuka, 2024). In addition, other recommendations for improving environmental labelling systems include the proposal to expand the assessment criteria to include aspects such as biodiversity loss, water consumption, and selected socioeconomic indicators (Ceballos-Santos et al., 2024; Wang et al., 2024). Attention is also drawn to the need to extend certification to new product groups (Desaulniers, Brousseau, 2024).

The next analytical category groups recommendations from the literature on the graphic design and presentation of ecolabels. These concern the way in which environmental information is presented, organised, and made available to consumers. Due to changes in retail channels, this issue also applies to presentation in online stores (Rafael, Pires, Simões, 2025). The studies analysed in this category recommend increasing legibility and using an intuitive format (Hay et al., 2024). R. Yuan and Z. Tang (2024) propose the use of a ‘traffic light’ system, which is very accessible and understandable to consumers. Furthermore, it is recommended to expand the scope of information presented on the label to include, for example, the region of origin or the production process, which allows for a better assessment of the sustainability of the product (Pablo-Cano et al., 2024). It is also pointed out that the choice of form and method of communication should be varied depending on the product category (Tanaka et al., 2024). In addition to these aspects, attention is drawn to the role of labels in online sales (Houf, Szymkowiak, Shepherd, 2024) and their presentation at the point of purchase, such as restaurants (Fang, Gao, Zhang, 2024).

The third analytical category brings together the results of research that has led to the development of recommendations to improve the credibility and trustworthiness of labelling systems. The issues grouped here concern the actions that need to be taken to create an image

of ecolabels as reliable tools for providing information about a given product or service. To achieve this goal, transparency must be ensured throughout the entire product supply chain, involving all participants (Damberg et al., 2024). The literature emphasises the importance of Cradle-to-Cradle Certified® certificates. The credibility of ecolabels depends on specific and precise information, presented in a clear and consistent manner (Alhamdi, Al-Kahtani, Abdullah, 2024). This builds consumer confidence in the actual sustainability of the product, rather than just declarations. Authors such as Chandan et al. (2025) propose the implementation of advanced solutions such as blockchain to enable product traceability and monitoring of environmental criteria compliance. Another important direction is the standardisation of environmental data in product databases (e.g., EBM), which will further strengthen the system by enabling the comparability and verifiability of declarations (Pham et al., 2024). These recommendations are intended to directly strengthen confidence in the environmental certification system and minimize the phenomenon of 'greenwash' (Bottega et al., 2024).

The fourth category concerns the role of the state, decision-makers, and public institutions. In this case, the authors of scientific studies point to the need to create conditions conducive to the development and dissemination of environmental labelling systems. Bukhari et al. (2025) emphasise that the promotion of voluntary environmental standards by governments should be supported and implemented. Some researchers argue that it would be necessary to provide fiscal and financial support to companies that join certification systems. This could even include the creation of a system of tax incentives for such companies (Dias et al., 2024). Another axis of support and promotion by governments is public procurement. The use of the concept of green public procurement to increase the presence of eco-certified products and services is also a proposed measure (Ullah et al., 2024). It is pointed out that the systematic inclusion of environmental requirements in public tenders may increase market players' interest in certification. This will generally contribute to its widespread use. Further directions for improving the environmental communication system through ecolabels include government measures aimed at shaping energy demand. This can be achieved through standards or labeling programs, where it will serve more as a tool for managing energy consumption in households (Twerefou et al., 2025).

The results of the studies grouped in this category confirm that without the involvement of governments and public policy, the potential of ecolabels as tools for supporting sustainable development will remain largely untapped.

The fifth category groups studies on the adaptation of labels to a diverse consumer market. These studies aimed to determine the form and content of ecolabels for different consumer segments, product characteristics, and purchasing contexts. Current research indicates that the effectiveness of labels is not uniform. Both willingness to pay (WTP) and sensitivity to information vary depending on the target group (Völker, Oestreich, Meyerding, 2025; Kitano, Horie, Yamamoto, 2025). The literature also points to the diversity of labelling systems within product groups, which can be beneficial if consumers have sufficient knowledge to understand

and interpret these differences (Wakamatsu, Maruyama, 2024). In summary, this category groups together studies on the design of eco-labelling in a differentiated and adaptive manner, rather than in a uniform manner. Such a postulate may be difficult or even impossible to implement. However, heterogeneous consumer profiles and the significant specificity of individual markets and distribution channels seem to confirm this need.

The sixth category of recommended areas for improvement in environmental communication concerns issues related to information campaigns and public education. These activities include initiatives aimed at giving ecolabels a real informational function. The results of the analysed studies confirm that labels should be consciously designed communication tools, widely supported and accompanied by information campaigns (Brécard, Chiroleu-Assouline, 2025). These campaigns increase the recognition of environmental labels, explain their meaning, and reduce consumer uncertainty and distrust. The results show that providing reliable information significantly increases the willingness to pay for a product bearing an ecolabel (Kitano, Horie, Yamamoto, 2025). Another area within this category is the need for systematic education and promotion of environmental certification systems (Yao et al., 2024). It is often stated that the gap between consumer perceptions and actual behaviour is due to insufficient information about sustainable practices and manufacturer certifications. Therefore, it is recommended to improve the presentation of information at the point of purchase, on websites, and in marketing materials. According to research by Bottega et al. (2024), decision makers should subsidise informational advertisements that explain the content and meaning of labels in the interest of the common good.

The last analytical category proposed was a group of studies on recommendations for producers and supply chain entities. It includes the results of research that focused on the behaviour of entities on the production side and the organisation and management of the entire supply chain. The analysed studies show that ecolabels and certification should also be treated as tools for shaping economic and development incentives for producers (Kesselring, 2025; Xin et al., 2025). The work of Sogn-Grundvåg et al. (2025) draws attention to the need to share the benefits of certification fairly with other participants in the supply chain. This is so that they are also encouraged and motivated to implement more sustainable practices. Research findings in the literature point out that manufacturers with higher environmental efficiency of their processes should prioritise investment in sustainable technologies and actively use ecolabels as a competitive advantage in environmentally sensitive markets (Xin et al. 2025). Another important issue is the role of transitional programs and national certification systems. As indicated by the research by Wakamatsu and Maruyama (2024), such solutions can bring high benefits and enable manufacturers to gradually recover the costs incurred for sustainable practices even during the certification process.

## 5. Discussion

Through the analysis and observations resulting from the research, several gaps in the current eco-labelling systems were identified. Thus, the research conducted allowed us to answer the research question RQ1: What are the directions for improving the environmental communication process? and, as a result, to identify the following areas for improvement and refinement of eco-labelling systems:

- the scope and rigour of ecolabel standards,
- graphic design and presentation of the label,
- the trustworthiness and credibility of the standard,
- public policy and incentive instruments for producers,
- adaptation of labels to a diverse consumer market,
- information campaigns and public education,
- – actions towards producers and supply chain entities.

These data are consistent with the findings of other scholars (Plakantonaki et al., 2023; Reardon et al., 2024; Ceballos-Santos et al., 2025; Srinivasan, 2025). However, in this study they are much more comprehensive and up-to-date. Reardon et al. (2024) identified critical gaps and areas for improvement such as lack of representativeness, incomplete assessment, and unintuitive communication with consumers. The directions identified in this study are, in a sense, consistent with what we observe in the literature on the subject.

Undoubtedly, the need to build trust and promote ecolabels, as indicated in many positions, is one of the fundamental conditions for the success of environmental communication initiatives.

This study creates a framework and categorises areas for the improvement of ecolabels based on the most up-to-date and latest data. Thus, this research gap is filled, and this work precisely identifies and describes the directions for improvement. In turn, in the work of Plakantonaki et al. (2023), they propose increasing government involvement and activities related to defining and enforcing environmental standards as key efforts toward improving the eco-labelling system. Other recommendations included educating consumers and systematically encouraging them to make sustainable purchasing decisions. Other researchers, such as Grolleau et al. (2015) propose supplementing regional, national, and international policies with issues related to ecolabels and increasing research on the effectiveness of ecolabels by the academic community.

## 6. Conclusions

This manuscript is the result of a review of the literature aimed at identifying and defining the main directions for improving the environmental communication process. Given the global importance of sustainability issues, this topic is very important from the point of view of both consumers and companies as market participants. The results of this study identify, synthesize, and assist decision makers and certification bodies in choosing directions for improving and refining environmental labelling systems. The analysis carried out has identified seven key categories within which action should be taken. These relate to different areas, which means that a systemic approach is required for their implementation. From the current perspective, it is difficult to assess which directions are the most important, but their effectiveness should be measured by improving objective environmental indicators.

The studies cited in this review indicate a wide scope for possible improvements. Gradual modification of environmental certification systems is necessary to strengthen trust, guide consumer demand, and keep pace with a changing world. Interestingly, a significant number of improvements were related to the scope of competence that is directly within the scope of certification bodies. The proposed requirement to improve the quality of eco-labelling, accompanied by reliable information on the ecolabel, helps to build consumer confidence. Entrepreneurs and management staff can also draw important suggestions and conclusions from this review. Above all, the data presented show that increased commitment and efforts toward environmental certification help to build a positive image and reputation for companies.

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