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Is sustainable certification's ability to combat greenwashing trustworthy?

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Introduction: Certifications are widely recognized as important tools in addressing climate change, safeguarding human rights, and promoting environmentally sustainable practices. However, this critical review article draws attention to potential negative impacts associated with certifications. The purpose of this review is to highlight the risks and challenges associated with certifications despite their intended benefits.

Methods: The review draws on existing literature on certifications and their impacts, as well as empirical studies on the effectiveness of certifications in addressing climate change, safeguarding human rights, and promoting environmentally sustainable practices.

Results: The review finds that certifications can increase the perceived value of eco-friendly brands and consumer willingness to pay. However, the review also highlights the risks of greenwashing and free riding, which can undermine the intended benefits of certifications. Additionally, the institutional organization of certification systems may exhibit structural inertia, which may impede the integration of disruptive green technologies and market transitions.

Discussion: The potential negative impacts of certifications on addressing climate change, safeguarding human rights, and promoting environmentally sustainable practices should not be overlooked. It is essential to implement measures to mitigate the risks of eco-opportunism and to effectively combat greenwashing. The review suggests that certification systems should be designed to promote innovation and the adoption of new technologies, rather than being a barrier to change.

Conclusion: Certifications are important tools for addressing climate change, safeguarding human rights, and promoting environmentally sustainable practices. However, their potential negative impacts should be acknowledged and addressed. The review recommends implementing measures to mitigate the risks of eco-opportunism and to effectively combat greenwashing, while promoting innovation and the adoption of new technologies.

KEYWORDS

certifications, free riding, eco-opportunism, greenwashing, willingness to pay, green brands, structural inertia theory, agency theory

Introduction

Sustainability certifications have experienced a significant global increase in recent years. The International Institute for Sustainable Development (IISD) reports that there are now over 400 sustainability certifications worldwide, covering various sectors, products, and industries such as food and agriculture, energy and environment, health and safety,

and social responsibility. This surge in certifications can be attributed to the growing awareness and importance of sustainability, driving more companies and organizations to seek certification to showcase their commitment to sustainable practices, standards, benchmarks, and distinguish themselves in the market.

Certifications are crucial tools for assessing quality and demonstrating competence, often based on external evaluations or approvals from reputable certification systems or organizations. These systems contribute to qualified assessments of standard quality, helping buyers or consumers navigate markets more easily and make more informed decisions. Certifications can be official documents or credentials that attest to an individual or organization's compliance with specific standards, regulations, or criteria established by well-recognized third-party entities. They can be awarded to individuals, products, services, or organizations and are typically developed and administered by professional associations, government agencies, or independent organizations. Certification programs may involve a combination of training, testing, and evaluation to ensure that criteria for certification have been met.

Although greenwashing is widely acknowledged as a major obstacle to achieving sustainable development goals, there has been insufficient research into its underlying causes (Nygaard and Silkoset, 2022). Meanwhile, various empirical studies have established a positive correlation between green certifications and consumers' willingness to pay for environmentally responsible products (as illustrated in Table 3). In this article, we examine the potential negative consequences of this willingness to pay, including the potential for greenwashing to arise as an unintended incentive. Additionally, we address the detrimental effects of both green free riding and greenwashing, which pose significant risks to the advancement of sustainable development.

Several international sustainability certifications exist, including the LEED certification, developed by the US Green Building Council, which evaluates the sustainability of buildings, homes, and communities (Lockwood, 2006). The Fair-Trade certification verifies that a product has been produced and traded in a socially and environmentally responsible manner, and that workers have been paid fair wages (Whelan and Kronthal-Sacco, 2019). The Forest Stewardship Council (FSC) certification verifies that wood and paper products have been sourced from responsibly managed forests (Denison, 2014). In the organic food industry, there are several certification systems, including the Organic certification, which verifies that food and agricultural products have been produced using organic farming practices that prioritize environmental sustainability, animal welfare, and human health (Denison, 2014). The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) form the specialized system for worldwide standardization. One example of an ISO sustainability certification is ISO/TS 17033, which sets out internationally agreed ways to make a credible ethical claim for products (Villena and Gioia, 2020). Overall, certifications play a crucial role in establishing and maintaining industry standards and promoting sustainable practices.

One example of this trend is the Leadership in Energy and Environmental Design (LEED) program, which has seen a surge in certified buildings worldwide, increasing from a handful in 2000 to over 100,000 in 2021. Another certification that has seen rapid growth is the Fair-Trade certification, with over 30,000 products certified in 2019 compared to just a few hundred in the early 2000s. Additionally, new sustainability certifications are emerging to address specific industries and issues. The Global Organic Textile Standard (GOTS), established in 2006, certifies textile products made from organic fibers and ensures their environmental and social sustainability.

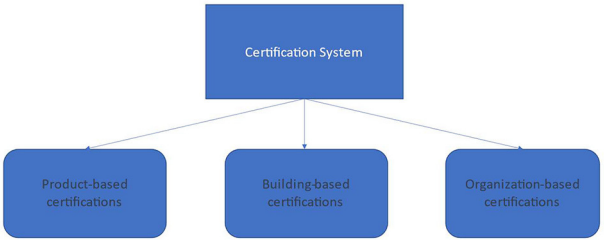

FIGURE 1
The different categories of green certification systems.

LEED, FSC, Green Seal, EcoLabel, EU Ecolabel, and Fairtrade are some of the most recognized and essential sustainability certifications, used to evaluate the environmental impacts of products and services. Overall, the increase in sustainability certifications reflects the rising demand from consumers and stakeholders for sustainable products and practices, as well as the desire of companies and organizations to meet these demands and showcase their commitment to sustainability in different areas (Figure 1).

Green certification systems and NGOs (non-government organizations) or green activist groups have a close relationship because they both aim to promote sustainability and encourage businesses and organizations to adopt more environmentally responsible practices.

NGOs and activist groups often play a critical role in the development and implementation of green certification systems. They may provide input and feedback during the development process, help to set sustainability standards, and advocate for the adoption of these standards by businesses and governments. NGOs and activist groups may also monitor and evaluate the effectiveness of green certification systems and raise awareness among consumers and the public about the importance of sustainable practices. By working closely with green certification systems, NGOs and activist groups can help to ensure that sustainability standards are robust, effective, and widely adopted.

On the other hand, green certification systems can provide a valuable tool for NGOs and activist groups to promote sustainability and hold businesses accountable for their environmental impact. By recognizing and rewarding companies that meet certain sustainability standards, green certification systems can incentivize businesses to improve their environmental performance and provide consumers with a way to make more informed choices.

Overall, the relationship between green certification systems and NGOs or activist groups is symbiotic, with each playing

a crucial role in promoting sustainability and driving positive change toward a more sustainable future. For example, The Forest Stewardship Council (FSC) certification system was developed with the help of environmental NGOs such as Greenpeace and the World Wildlife Fund (WWF). These organizations provided input on the standards for sustainable forestry and helped to promote the adoption of FSC-certified products. Another example of the relationship between NGOs and certification systems is The Rainforest Alliance certification system, which promotes sustainable agriculture and forestry. It was developed with input from NGOs such as the Environmental Defense Fund and Conservation International. These organizations helped to shape the standards for sustainable land use and provided guidance on how to engage with local communities.

The LEED certification system for green buildings was developed by the US Green Building Council (USGBC), which includes a range of stakeholders including NGOs and activist groups. The USGBC worked closely with organizations such as the Natural Resources Defense Council (NRDC) to develop the LEED standards, which encourage the use of sustainable materials, energy-efficient design, and healthy indoor environments. The Marine Stewardship Council (MSC) certification system for sustainable seafood was developed with input from a range of stakeholders including NGOs such as the WWF, the Blue Ocean Institute, and the Monterey Bay Aquarium. These organizations helped to shape the standards for sustainable fishing and aquaculture, and they continue to work with the MSC to promote sustainable seafood choices among consumers. Through collaboration and cooperation, these organizations can drive positive change toward a more sustainable future.

The connection between state institutions and laws and certifications is important for promoting sustainability and ensuring that businesses and organizations are held accountable for their environmental impact. Institutions, such as governments and regulatory agencies, may establish laws and regulations that require businesses and organizations to comply with certain sustainability standards. For example, a government may require companies to reduce their greenhouse gas emissions or implement sustainable land use practices.

Certification systems can complement these laws and regulations by providing a mechanism for businesses and organizations to demonstrate compliance with sustainability standards. For example, a building may be required to meet certain energy efficiency standards under local building codes, but the owners may also seek LEED certification to demonstrate their commitment to sustainability and gain recognition for their efforts.

In some cases, certification systems may be established by governments or regulatory agencies themselves. For example, the US Environmental Protection Agency (EPA) has established the Energy Star certification program, which recognizes products that meet certain energy efficiency standards. Similarly, some governments have established eco-labeling programs that provide certification to products that meet certain environmental standards.

Certification systems can also play a role in driving the development of new laws and regulations. For example, the Forest Stewardship Council (FSC) certification system for sustainable forestry has influenced the development of laws and regulations related to sustainable forestry in many countries. Overall, the connection between state institutions and laws, certifications and the role of NGOs and activist groups is important for promoting sustainability and ensuring that businesses and organizations are held accountable for their environmental impact.

Can we trust green certifications?

A way to encourage sustainability is through certification systems that recognize and incentivize organizations and products that meet specific sustainability standards. Table 1 demonstrates the main types of certification systems that promote sustainability, including product-based, building-based, and organization-based certifications. Product-based certifications focus on evaluating the environmental, social, and economic impact of individual or groups of products. These certifications are important because they help consumers make more informed choices about their purchases and encourage businesses to improve their sustainability practices.

Certifications that focus on individual products include the Forest Stewardship Council (FSC) certification for sustainable forestry, which promotes responsible forest management and the use of wood products. The Marine Stewardship Council (MSC) certification for sustainable seafood ensures that seafood is harvested in a manner that protects marine ecosystems. The Cradle to Cradle certification for sustainable products assesses the entire life cycle of a product and encourages the use of environmentally safe materials.

In contrast, building-based certifications concentrate on the sustainability of buildings, including the environmental, social, and economic impacts associated with their construction and operation. These certifications are crucial because buildings are major sources of energy consumption and greenhouse gas emissions, and they can have significant impacts on human health and wellbeing. Examples of building-based certifications include the Leadership in Energy and Environmental Design (LEED) certification for green buildings, which recognizes buildings that are energy-efficient, use sustainable materials, and have a positive impact on the environment and occupants; and the WELL Building Standard certification for healthy buildings, which promotes healthy indoor environments by addressing factors such as air quality, lighting, and ergonomics. Organizational certifications concentrate on an organization's sustainability, including its impact on the environment, society, and economy. These certifications play a crucial role in encouraging companies to adopt sustainable practices across their operations and supply chains, while also providing consumers with a means to identify businesses committed to sustainability. Examples of organizational certifications include the ISO 14001 certification for environmental management systems, which assists companies in reducing their environmental impact by implementing an efficient environmental management system. Another example is the B Corp certification, which assesses a company's social and environmental performance, accountability, and transparency, promoting socially and environmentally responsible businesses.

TABLE 1 Product, process, and organizational based certification systems and examples.

Category	Description	Examples
Product certification	This type of certification verifies that a product meets certain environmental or social sustainability standards.	Forest Stewardship Council (FSC) certification for sustainably sourced wood products, Cradle to Cradle certification for environmentally safe and responsible products, Fairtrade certification for products that meet social and environmental standards
Process certification	This type of certification verifies that a company's operations or management systems meet certain sustainability standards or criteria.	LEED (Leadership in Energy and Environmental Design) certification for green buildings, B Corp certification for companies that meet social and environmental performance standards, ISO 14001 (environmental management) certification for companies that implement sustainable environmental practices
Organizational-based certification	This type of certification verifies that a company meets certain sustainability standards or criteria across its entire organization.	Certified Green Business certification for companies that meet environmental sustainability standards, Global Reporting Initiative (GRI) certification for companies that report their sustainability performance, SA8000 certification for companies that meet social accountability standards

Sustainability certification systems play an important role in promoting sustainability across a range of industries and sectors. The nature of these institutional systems is intertwined with political and stakeholder interests (Table 2). By recognizing and rewarding sustainable practices, these certification systems encourage companies to adopt more sustainable practices and provide consumers with the information they need to make more informed choices. Whether through product-based, building-based, or organization-based certifications, sustainability certification systems are an important tool in creating a more sustainable and equitable world as long as we can trust these institutions.

Institutional trust refers to the level of confidence that individuals or groups have in governing institutions, such as government, law enforcement, or certification systems (Zucker, 1986). These institutions are established to minimize transaction costs and protect the interests of both parties involved in a transaction (North, 1991). Certifications are designed to safeguard buyers in markets where sellers have access to more information (Akerlof, 1970). Institutional trust is built on the belief that the institutions responsible for determining which organizations are qualified to become certified are honest, fair, competent, and reliable in fulfilling their obligations and responsibilities. For example, green certifications are institutions that rely on institutional trust, ensuring that certified environmental and social performance is reliable and not fraudulent or misleading. Although certifications play a significant role in promoting sustainability globally, institutional trust can erode over time as the dynamics of technology and markets change (Nygaard and Silkoset, 2022).

Certification systems worldwide have extended their influence, highlighting a significant global information issue that can undermine institutional trust. Unfortunately, green certification systems have been marred by various scandals. For example, in 2019, the Forestry Stewardship Council (FSC) certified Brazilian Amazon lumber companies that engaged in illegal logging activities, which damaged the FSC's credibility. Recent investigations by The Guardian, Die Zeit, and SourceMaterial have also exposed that over 90% of rainforest credits certified by Verra, the largest carbon credit certifier, do not represent actual carbon reductions, and may even exacerbate global warming (Greenfield, 2023). Additionally, offsetting projects co-managed by the NGO Conservation International and the Peruvian government have revealed alarming human rights concerns.

In 2020, investigations revealed that the European Union's Ecolabel system granted certifications to companies that didn't meet their own standards. These criticisms extend to the expense of implementing the systems, the possibility of fraud or mismanagement, the accuracy and reliability of the systems, as well as the difficulties associated with verifying and enforcing compliance (Lippert, 2009). A meta-analysis that looked at 4,500 seafood product tests from 51 publications found that, on average, 30% of them weren't the species that were claimed on the label (Pardo et al., 2016). Certification systems such as LEED, FSC, Green Seal, EcoLabel, EU Ecolabel, and Fairtrade have faced accusations of illegal, unethical, or deceptive actions. The Forestry Stewardship Council (FSC) was accused in 2019 of certifying companies in the Brazilian Amazon that were illegally cutting down trees, while an investigation in 2020 revealed that the European Union's Ecolabel system was awarding certifications to companies that were not meeting their own standards. KRAV, a Swedish organization that offers certification for organic food and agricultural products, has stricter standards than the EU's minimum requirements for organic production, meaning that products certified by KRAV meet both their standards and the EU's minimum requirements. However, in 2021, animal welfare scandals among Krav-certified farms led to an investigation. This high incidence of misrepresentation highlights the crucial need for institutional trust in sustaining resources overall (Barendse et al., 2019). A study based on interviews with senior quality managers, consultants and auditors revealed that it is a widespread practice of fake ISO 9001 certificates together with an unreliable evaluation process to get certification in China (Heras-Saizarbitoria and Boiral, 2019).

According to Camilleri (2022), the challenges faced by green certification systems are numerous, including the cost of implementation, the potential for fraud or mismanagement, the accuracy and reliability of the system, and the difficulty of verifying and enforcing compliance. While certifications for sustainable activities serve as a formal instrument to regulate the green transition, the rapid pace of development in sustainable technology and markets can make it challenging to keep up with the disruptive green innovations and entrepreneurship. Furthermore, maintaining and enforcing green certification systems can be

TABLE 2 Some examples of global certification systems and their most important stakeholder NGO counterparts.

Certification system	Associated stakeholder NGO interest group
Forest Stewardship Council (FSC)	World Wildlife Fund (WWF)
Marine Stewardship Council (MSC)	WWF
Rainforest Alliance	Rainforest Foundation
Fair Trade	Fairtrade International
LEED	U.S. Green Building Council

a complex and resource-intensive process. In addition to the challenges mentioned, certification systems can also be difficult to maintain due to their complexity and the amount of time and resources required.

The existence of greenwashing poses a significant threat to the sustainable transition of businesses, markets, and technology. While certifications are often viewed as a means of promoting increased willingness to pay, enhancing green brand equity, and preventing greenwashing, research suggests that trust in certifications can also incentivize greenwashing. As Ndubisi et al. (2020) note, firms may have an incentive to free ride on other firms' membership costs and certifications. Additionally, a lack of information, enforcement, and consistency between regulations and the evolving dynamics of sustainable product and production markets can create opportunities for greenwashing. Over time, incomplete control and information asymmetry can lead to potential free riding among certification holders in the sustainable product market.

The efficacy of green certifications has been called into question. Both Heras-Saizarbitoria et al. (2020a) and Coen et al. (2022) raise concerns about the disciplining effects of certification schemes. Heras-Saizarbitoria et al. (2020b) discovered that green certification led to only marginal improvements in environmental performance. Moreover, certification systems may have limited impact in a complex and constantly changing global context, particularly when weak institutional trust underpins their implementation.

Studies have highlighted the issue of "aggregation of scattered and fuzzy indicators" which makes it difficult and costly to measure the effects of certifications (Boiral et al., 2021). Information asymmetry further complicates control and enforcement (Heras-Saizarbitoria et al., 2020a). Interpretation of certification standards, such as the ISO 14001 system, can vary (Heras-Saizarbitoria et al., 2013), making enforcement and potential eco-opportunism a key problem. Additionally, a meta-study of 37 studies found that only six reported social or environmental benefits of certifications (Blackman and Rivera, 2010).

Certifications and eco-opportunism

Certifications can be seen as intentionally complete and written contracts designed to regulate, restrict, and encourage sustainable decision-making. In theory, complete contracts are agreements that contain all the necessary information to define the terms and conditions of the contract clearly. They are typically written to minimize the potential for misunderstanding or ambiguity and may include specific provisions for dispute resolution, legal remedies, and the obligations of each party involved (Milgrom and Roberts, 1992).

Green certification systems have emerged as a powerful tool for promoting circular and sustainable economies worldwide in recent years. The number of sustainability certifications has significantly increased over the past few decades, aimed at establishing trust among consumers and other stakeholders (Henson and Humphrey, 2010; Smith and Fischlein, 2010). These certifications help individuals make informed decisions, establish preferences, and evaluate the consequences, risks, and rewards in the marketplace. Certifications also provide guidance and standard quality signals, especially in a disruptive, changing, and uncertain economy (Png and Reitman, 1995).

However, in the complex supply chains that involve global networks of firms, incentives may become dysfunctional and opportunistic, leading to eco-opportunism (Nygaard, 2022a). Eco-opportunism refers to hidden self-interest-seeking behavior that undermines the transition toward sustainability through intentional deceit. Despite the positive role played by certifications, their effectiveness may be hampered by eco-opportunism in some cases, thereby highlighting the need for continuous vigilance and scrutiny of the certification process to ensure that it remains true to its objectives.

Eco-opportunism involves the unethical practice of free riding on collective capital, such as trust in green brands and certifications. Green free riding occurs when one party in the certification system benefits from the collective efforts of others toward green entrepreneurship, sustainable innovations, and investments in environment, social or green governance, while avoiding the associated costs associated to submit to the standardizations (Coughlan et al., 2006, p. 525). Lack of information among consumers can make them vulnerable to hidden self-interest-driven actions (eco opportunism) that deceive them into purchasing non-sustainable products, instead of circular and sustainable ones. This leads to greenwashing of products, technologies, and markets, ultimately resulting in a lemon problem, where non-sustainable products gain an unfair advantage over genuinely sustainable ones. This poses a significant threat to the green transition (Nygaard and Silkoset, 2022) and the circular economy, as famously outlined in Akerlof's (1970) Nobel Prize-winning paper. In this context, eco-opportunism is a critical issue that must be addressed as a driving force behind free riding on green assets built through certifications and green brands created by others. Furthermore, incentive issues related to certification systems that promote willingness to pay and the development of certified green brands must also be considered. Agents operating under the quality image of green certifications and brands may engage in free riding on sustainability as a capital, thus creating a behavioral risk of eco-opportunism (Nygaard, 2022a).

Willingness to pay

Green certification systems can lead to an increase in consumers' willingness to pay due to positive preference effects, which can affect brand equity. However, this can also create

dysfunctional incentives for some economic agents to free ride on certifications and engage in greenwashing activities. Consequently, willingness to pay is a critical aspect of the strategy for transitioning to a green economy. Several studies have investigated consumer preferences for sustainable energy sources and related characteristics.

Table 3 presents a compilation of meta-studies that analyze the impact of green certifications and institutions that support them on consumers' willingness to pay for certified products and energy sources. In order to investigate the economic implications of green certifications, we conducted a thorough review of published meta-studies on this subject. These meta-studies cover a wide range of certified products, including sustainable food items, renewable energy sources, and certified wood products. Meta-study is a research method that systematically examines and combines multiple studies on a particular topic or question. The aim of a meta-study is to provide a comprehensive and unbiased summary of existing research findings, which indicate a positive relationship between institutional structures and the willingness to pay. The meta-studies employ various analytical techniques such as regression analysis, meta-regression analysis, and Bayesian hierarchical models.

The main findings of the studies are also diverse. For example, the meta-analysis of consumer's willingness to pay (WTP)for socially responsible products by Tully and Winer (2014) found that certification increases willingness to pay for sustainable products by 7% on average. In contrast, the meta-study by Sundt and Rehdanz (2015) found that willingness to pay for green electricity differs by source, with hydropower being the least valued.

Tully and Winer's (2014) meta-study analyzed 80 published and unpublished research papers across various product categories to examine the role of beneficiaries in consumers' WTP for socially responsible products. Using OLS regression, the study found that certification increased WTP for sustainable products by an average of 7%. Cai and Aguilar's (2013) meta-analysis used Bayesian hierarchical models to estimate WTP premiums for certified wood products over non-certified options. The data came from 19 studies conducted worldwide, and the results showed that WTP premiums ranged from 1.0 to 39.3%. However, the study notes that the use of Conjoint analyses might have inflated the results. Soon and Ahmad's (2015) meta-study examined 30 studies to analyze households' WTP for renewable energy use. Using a random-effect meta-regression model, the study found that households are willing to pay an increase in a specific amount per month over the price of energy they are currently paying for to shift to renewable energy source use. Sundt and Rehdanz (2015) meta-regression examined 85 WTP values from 18 studies to analyze consumers' WTP for green electricity. The study found that WTP for green electricity differs by source, with hydropower being the least valued. Li and Kallas (2021) meta-analysis examined 80 worldwide studies to estimate the overall WTP premium for sustainability for food products. Using subgroup analysis and meta-regression, the study found that the WTP premium for sustainability is 29.5% on average. Chaikumbung's (2021) meta-regression analyzed 509 observations of WTP from 91 renewable energy studies in 27 countries. The study found that institutions, with their country-specific and survey-specific factors, have a great influence on WTP. Consumers in more democratic and capitalistic countries assign higher values for renewable energy. Abdu and Mutuku (2021) meta-study found that consumers' purchase behavior in selected countries is pro–eco–coffee.

In general, these meta-studies offer valuable insights into the factors that influence consumers' willingness to pay for sustainable products and energy sources based on trust in institutional frameworks. These insights can inform marketing strategies and policies that aim to promote sustainable consumption. The willingness of consumers to pay for socially responsible products has become a significant area of research in recent years. Table 3 presents a summary of multiple meta-studies that explore consumers' willingness to pay (WTP) for socially responsible products, including certified wood products, sustainable products, renewable energy, and animal welfare. The meta-studies utilize different methods to analyze the data and report varying WTP values. Nevertheless, most studies indicate that certifications, renewable energy, and animal welfare enhance consumers' WTP for products.

The problem of green certifications

Collaboration is essential in business, but it is difficult to establish a contract that comprehensively outlines all aspects of the partnership between the certification system and the certified agent. Collaborations are influenced by various uncontrollable factors, resulting in imperfect contracts that regulate certifications and require the reliance on unwritten rules. Moreover, certification systems, like all written contracts, may become outdated and irrelevant as dynamic green market conditions change, making them "perishable goods". As a result, implicit rules and trust, which are informal and unwritten, become crucial in securing transactions over time, as they adapt to market attitudes and regulate themselves. However, it is problematic that certified companies have to rely on implicit self-regulation and trust rather than explicit rules that are monitored and enforced.

Conversely, market uncertainty can lead to a decreased level of control and enforcement and an emphasis on market-oriented decisions based on self-interests, information asymmetry and ultimately eco-opportunism. In complex and constantly changing environments due to the green transition, decentralized and less formalized relationships are often preferable to hierarchical and bureaucratic ones, as the latter can hinder decision-making processes. Therefore, heightened uncertainty can result in less control of certified units, as each unit must make quick adjustments to adapt.

Eco-opportunism is the pursuit of concealed self-interest within the framework of sustainable development, affecting the entire product lifecycle network and supply chains (Nygaard, 2022a). This behavior is often observed in companies engaging in green free riding on certification systems and ultimately greenwashing, misleadingly portraying themselves as environmentally friendly. However, economic agents have become increasingly vigilant in monitoring and controlling their entire supply chains to assess the potential risks of eco-opportunistic behavior. Some companies outsource unsustainable parts of their

TABLE 3 Meta-studies on willingness to pay for Certified Sustainable products and renewable energy sources or supported by institutions.

References	# of studies	Methods	Main findings
Tully and Winer (2014)	80 published and unpublished research papers across a large number of product categories	OLS regression	Certification increases WTP for sustainable products by 7% on average.
Cai and Aguilar (2013)	Data from 19 different studies conducted around the world.	Bayesian hierarchical models	Estimates of WTP premiums for certified wood products over non-certified options reported in the literature range from 1.0 to 39.3%.
Soon and Ahmad (2015)	A final total of 30 studies.	random-effect meta-regression model to explain the variations in the households' WTP	On average, households are willing to pay an increase of this amount per month over the price of energy they are currently paying for, to shift to Renewable Energy Source use.
Sundt and Rehdanz (2015)	Our final meta-regression consists of 85 WTP values that are ascertained from 18 studies.	Meta-regression	WTP for green electricity differs by source, with hydropower being the least valued.
Li and Kallas (2021)	Meta-analysis of 80 worldwide studies	Subgroup analysis and meta-regression	The results suggest that the overall WTP premium for sustainability (in percentage terms) is 29.5% on average.
Chaikumbung (2021)	Willingness to pay (WTP) for electricity generated from renewables analysis to 509 observations of WTP from 91 renewable energy studies in 27 countries.	The paper applies meta-regression	The results suggest those institutions, with their country-specific and survey-specific factors, has a great influence on WTP. Consumers in more democratic and capitalistic countries assign higher values for renewable energy
Abdu and Mutuku (2021)	Meta-analysis that combines individual willingness to pay ($n = 97$) from 22 primary (15 years).	Meta-analysis	Consumers' purchase behavior in selected countries is pro–eco–coffee.

supply chain by sourcing resources in gray and even black markets, where monitoring is challenging and expensive (Ndubisi et al., 2020). The conventional understanding of economic opportunism, which focused on analyzing business-to-business relationships and its transaction costs (Williamson, 1985), has given way to a more comprehensive approach that considers the entire network of organizations involved in sustainable economic activities as the new level of analysis (Nygaard, 2022a).

Structural inertia and green certifications

Certifications are formal and centralized systems of contract governance that operate under written regulations. While they may be perceived as rigid and bureaucratic, they are not a "complete contract" and allow for interpretation and evolution toward sustainable practices. The growing popularity of certification systems reflects a belief in a predictable future that can be regulated, monitored, and enforced based on prior experiences of industrial development. However, the linear model of thought embodied by the proliferation of green certifications may not be effectively applied in times of significant uncertainty, complexity, and unpredictability, such as during concurrent crises like COVID-19, war, and climate change. In such circumstances, organizations must demonstrate dynamic and innovative capabilities to adapt. This may require certification systems to adopt more decentralized and autonomous governance systems or direct management within larger organizations (Lawrence and Lorsch, 1967).

The inflexibility of green certification systems can impede their ability to adjust to disruptive changes (Hannan and Freeman, 1984). These systems, which aim to promote sustainable transformation, may develop rigid processes and frameworks that discourage change, even when it is essential for sustainable progress (Cyert and March, 1963). In the face of market and technological disruptions needed for the green transition, decision-makers may become trapped in a strategic blind spot (Bower and Christensen, 1995), which can be compounded by the inertia associated with longstanding organizational structures, such as certification systems (Le Mens et al., 2015).

A narrow definition of sustainability can result in shortsightedness and poor strategies, as exemplified by the concept of "marketing myopia" introduced by Levitt (1960). This concept highlights the dangers of becoming too narrowly focused on their products or services, rather than on the needs of their customers with regards to access to new sustainable technologies or markets. It is crucial not to overlook customer needs when developing sustainable strategies in a rapidly changing technological environment. For instance, oil companies that have redefined themselves as sustainable "energy companies" have made innovative and bold strategic decisions. On the other hand, Kodak's focus on film technology prevented them from recognizing the potential of digital photography, leading to their decline. Similarly, Blockbuster, a dominant player in the rental market, ignored technological change, lost its position to Netflix, and ultimately went bankrupt. The green transition though, is far more disruptive due to complex driving forces such as critical minerals, digitalization, and new energy systems (Nygaard, 2022b).

Decision-makers can be hindered by organizational inertia, preventing them from understanding the changing needs and preferences of consumers and developing sustainable products that meet those needs. Figure 2 illustrates how disruptive sustainable change challenges structural inertia, which can resist change and encourage eco-opportunism.

The outdated and unsuitable bureaucratic processes, stakeholder power, and political systems that are often interlinked

FIGURE 2
Relations between disruptions, structural inertia, and the risk of eco-opportunism.

within certification systems result in structural inertia, which resists change in response to disruptive technological or market environments. The maintenance of interactive processes among employees, management, and powerful stakeholder organizations contributes to this resistance, which is further reinforced by factors such as job security, personal benefits and incentives, career advancement, and status. The intertwined nature of these factors results in an inability to adapt to disruptive changes, making it crucial to reevaluate and update these structures and processes to keep up with changing environmental demands. By doing so, certification systems can remain effective in promoting sustainable change.

Deliberately comprehensive contracts that aim to anticipate future developments, such as explicit definitions of sustainable standards and regulations, are often based on a linear understanding of markets and technologies. However, external shocks, such as disruptive changes, can fundamentally alter the economic environment of transactions. Mintzberg's (1978) analysis of Volkswagen and the Vietnam war suggests that strategic processes are characterized by the interplay between a dynamic environment and bureaucratic momentum. Certifications alone are not a dynamic enough tool to regulate the rapidly evolving and complex developments in sustainable technology and markets. Gradually, regulations become less effective and unable to facilitate sustainable transformation. But when external shocks occur, the strategic aspects of linearity and planning break down. Contingency theory (Galbraith, 1982) suggests that regulatory uncertainty supports indirect measures to incentivize green growth. In unpredictable regulatory environments, industries may adopt decentralized structures with lower levels of vertical control to monitor activities to produce sustainable performance (Burns and Stalker, 1961). This reduced control can allow them to operate without the drawbacks of lengthy communication channels, decision-making delays, and the burden of uniformity and bureaucratization (Etgar, 1977).

Free riding on certified green brands

Coughlan et al. (2006) defines free riding as a situation where one party enjoys the benefits while the other bears the costs. In the context of certifications, free riding occurs when certified entities engage in activities that undermine the value of the certification, leading to reputational damage and associated costs. Albanese and Van Fleet (1985) suggests that free riding is a response to task conditions that sustain the certification's credibility. A common example of free riding is when companies do not comply with the standards prescribed in the certification, yet still benefit from the efforts of other certified companies that do. Similarly, companies that do not follow the procedures and guidelines outlined in the certification can exploit the environmentally friendly practices of other certified companies. These green free riders can enjoy the benefits of increased willingness to pay while reducing their costs and efforts associated with complying with the certification's requirements.

Certified businesses bear the responsibility of upholding the quality standards that showcase their exceptional performance to customers, and this requires adhering to the sustainability criteria outlined in the certification system. It's reasonable to assume that if employees within a certified company are unaware of the sustainability standards prescribed by the certification system, they would struggle to maintain the benchmarks associated with the certification. This assumption stems from the notion that even a single free rider who neglects sustainability can compromise the certification's credibility and affect other facets of the certification system.

The challenge of green free riding is significant for both brand and certification strategies, as highlighted by Kidwell et al. (2007). Green brand equity is established through customer perception, loyalty, and recognition, reflecting the gap between the perceived and actual value of a sustainable product or service. It plays a vital role in determining a product's success, influencing pricing and customer decisions (Aaker, 1992; Rao and Bergen, 1992). In markets where "green" brands enjoy high levels of trust, consumers are more inclined to buy certified products from these retailers (Png and Reitman, 1995). Branded products typically command a premium price due to the perceived superior sustainable quality and service they offer. Over time, businesses develop a brand reputation that becomes a standard quality image associated with the brand name (Akerlof, 1970).

Allowing others to represent a green brand carries the risk of damaging its reputation for quality (Silkoset et al., 2016). Customers may find it difficult to identify low-quality products that are priced cheaply, making it necessary to signal standard quality through green branding (Akerlof, 1970). Green free riding occurs when a company in a network of firms representing the green brand undermines sustainable quality, leading to reputational damage and decreased value of the green brand (Aaker, 2004, p. 86; Png and Reitman, 1995). By prioritizing short-term gains, free riding undermines the overall perception of the green brand and its quality.

Model, and theoretical implications

Based on conventional wisdom, anecdotal evidence, and meta-studies of empirical research, green certifications tend to enhance consumers' willingness to pay because they associate such certifications with environmentally responsible brands. However, the effectiveness of green certifications is a matter of concern (Table 4). The disciplinary influence of certification schemes is questioned by Heras-Saizarbitoria et al. (2020a), Coen et al. (2022), and Nygaard and Silkoset (2022). According to the latter authors, there is only a minor improvement in environmental performance because of green certification. Moreover, certification systems may have limited impact in a complex and constantly

TABLE 4 Pros and cons of implementing green certification systems.

Pros	Cons
Provides a way to verify compliance with certain sustainable standards or criteria	Can be expensive and time-consuming to obtain and maintain certification and other companies can enjoy the advantages while the other bears the expenses of certification (green free riding)
Builds credibility and trust with customers, investors, and stakeholders	Certification requirements may not always be aligned with a company's specific goals or needs
Helps companies stand out in a crowded market and to build valuable sustainable brands	Certification does not guarantee the quality or sustainability of a product or service
Provides a framework for continuous improvement	Certification standards may not be updated frequently enough to keep up with evolving sustainability issues because of the dynamics in green innovations and entrepreneurship. Outdated and unsuitable bureaucratic processes, stakeholder power, and political systems that are often interlinked within certification systems result in structural inertia, which resists change in response to dynamic disruptive technological or market environments
Encourages best practices and can drive innovation	Certification can be seen as a costly symbolic procedure "checkbox" exercise without meaningful change or impact
Can lead to cost savings by improving efficiency and reducing waste	Some companies may engage in "greenwashing" by using certification as a marketing tool without making meaningful changes to their practices

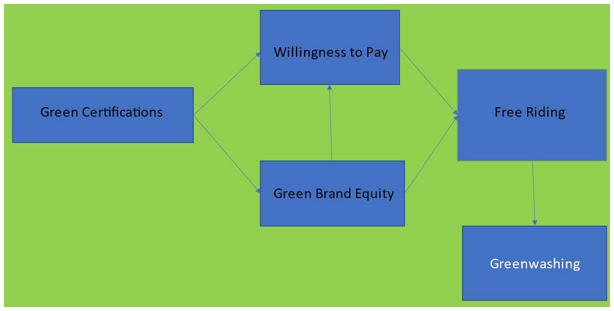

FIGURE 3
Effects of eco-opportunism following green certification that leads to free riding and greenwashing.

evolving global context, particularly when weak institutional trust undermines their enforcement. The theory of eco-opportunism suggests that this heightened willingness to pay and improved green brand equity could also promote free riding behavior, resulting in a scarcity of sustainability standards among the green brands that consumers trust. This phenomenon, known as greenwashing, arises when products are marketed as eco-friendly but fail to meet sustainable standards, despite being certified as such. The theoretical relationships presented in this review article, illustrated in Figure 3, analyze the unintended negative consequences of certification systems. The growth of certification systems as institutional structures is associated with positive economic behavior, such as increased willingness to pay and green brand equity. Nonetheless, our analysis underscores the potential danger of both factors in encouraging eco-opportunism, including free riding on certification systems and greenwashing.

Limitations

A limitation of a meta-study of meta-studies is that it relies on the quality and scope of the single studies included in the analysis. Additionally, meta-studies may face challenges in synthesizing studies with differing methodologies, sample sizes, and study designs. It's also possible that some relevant studies were missed, or that the meta-study itself introduces bias through the selection of studies or the interpretation of results. Finally, while meta-studies can identify patterns and trends, they may not be able to provide definitive conclusions or explanations for observed effects. In this review, the meta-studies had a background role supporting the theoretical inquiry into the literature, anectodical evidence and cases. Further research should explore propositions in the theoretical model exhibited in the model (Figure 3). Research efforts should develop causal designs that benefit from time asymmetry between certifications and positive (sustainability and willingness to pay) or negative outcomes (greenwashing, green free riding) and how to incentivize sustainable performance.

Conclusion

The main argument of the paper is that uninformed green consumers may unintentionally choose unsustainable products due to greenwashing. However, the analyses conducted in the study indicate that while certifications can help prevent greenwashing, they can also contribute to eco-opportunism. We aim to shed light on this complex issue and encourage further research in this crucial area of sustainable development.

Certifications and institutions that support environmental responsibility can increase consumers' willingness to pay for eco-friendly brands. However, the theory of eco-opportunism warns that this can lead to free riding and greenwashing, where products are falsely advertised as sustainable but fail to meet certified standards. Although certification systems can encourage positive sustainable behavior, they are also vulnerable to disruptive changes in technology and markets, which can make them obsolete, ineffective, and prone to eco-opportunism.

Institutional resistance to change and stakeholder power, bureaucratic processes, and political systems that reinforce this resistance make it difficult to address this challenge. To overcome this, organizations should adopt a customer-centric approach and understand the needs of sustainable consumers. The control and enforcement of certification systems are crucial to promoting dynamic change. However, factors such as job security, personal incentives, career advancement, and status make it challenging for certification systems to adapt to disruptive changes.

To remain effective in promoting sustainable change, it is necessary to reevaluate and update these structures and processes continually. Organizations and certification systems must keep up with evolving environmental demands and ensure information

transparency. By doing so, they can stay relevant, competitive and adapt to disruptive sustainable change.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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