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## Mitigating Greenwashing Across World Regions: An Integrated Behavioral and Regulatory Approach

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### ABSTRACT

This research examines greenwashing across global regions and proposes an integrated behavioural-regulatory intervention framework to mitigate these practices. Using a systematic literature review and VOS viewer software, the study analyzed 2,098 peer-reviewed articles from six databases ranging from 2009 to 2024. Findings show that the energy sector is the most affected by greenwashing, followed by the fashion and food industries. The U.S. has the highest greenwashing rate at 36.8%, with Europe at 35.8% and Africa at 2.2%. The study highlights that weak enforcement of environmental regulations and over-reliance on regulatory measures contribute to greenwashing. It proposes a framework that integrates behavioural economics with regulatory strategies to combat greenwashing, aiming to enhance the literature on environmental, social, and governance (ESG) issues. The findings have significant implications for corporate governance and environmental ethics, advocating for a multidisciplinary approach to address greenwashing globally.

### INTRODUCTION

This study explores the prevalence of greenwashing across the world's regions and explores ways to mitigate greenwashing tactics through the proposed interventional frameworks. The concept of greenwashing has emerged as an urgent issue in current academic, professional and environmental policy discussions, particularly as the demand for environment sustainability practices and the effects of climate change escalate globally. However, this surge in demand for environmental sustainability has also given rise to the phenomenon of greenwashing (Climate Facts Check, 2023). Nemes *et al.* (2022) alarmingly report that about 40% of environmental sustainability claims are categorized as greenwashing. However, the prevalence or frequency of greenwashing seems to vary across the world regions. The variations in the forms and frequency of greenwashing reflect the differences in the consumer or stakeholders' awareness and differences in regulatory frameworks and market conditions (European Commission, 2020; Ioannou *et al.*, 2023). The concept of "greenwashing" was introduced by environmentalist Jay Westerveld in 1986. It describes the misleading and deceitful promotion of products by organizations as being environmentally friendly, even though their actual practices may be harmful to the environment (Gatti *et al.*, 2022; Penddse *et al.*, 2023). Greenwashing manifests itself in many ways. Both the private and public sectors may be involved in greenwashing tactics to portray or project an environmentally friendly image or to create an environmental responsibility illusion (Hu *et al.*, 2023). At this critical point in the history of planet Earth, as the global community races to mitigate the escalating greenhouse gas (GHG) emissions to

limit the increase in global temperatures to 1.5 degrees Celsius, the GHG emissions from large industries have emerged as a primary concern regarding global warming and climate change. The Paris Agreement (2015) has prompted numerous nations to commit to reducing GHG emissions and striving for 'net-zero' emissions by 2050. Consequently, many prominent companies are also making climate commitments. Nevertheless, rather than genuinely transforming their operations to be more environmentally sustainable and effectively mitigating carbon emissions and their effects on the environment, a significant number of these leading corporations are engaging in 'greenwashing' to enhance their public image. The increasing prevalence of greenwashing seems to undermine the progress in reducing carbon emissions and achieving the objectives outlined in the Paris Agreement (2015), which aims for net-zero emissions by the year 2050.

Greenwashing has become a significant concern in both compliance carbon market-based (CCMs) and voluntary carbon markets (VCMs), which are vital to global efforts to lower GHG emissions. More often, it seems that organizations across the world-regions often engage in greenwashing by overstating their environmental sustainability initiatives (Staples & Liebenberg, 2023). For instance, in VCMs, this behaviour can create a misleading perception of climate action, allowing companies or organizations to continue their emissions while claiming to be carbon neutral (Streck, 2021). Overall, greenwashing undermines both the integrity and the effectiveness of carbon markets, which are expected to grow substantially by 2030 as market-based climate change mitigation approaches.

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A review of the relatively recent extant literature indicates that current studies on greenwashing primarily concentrate on several key areas: the development and conceptualization of greenwashing within the European context (De Freitas Netto *et al.*, 2020), the ethical and practical aspects of greenwashing as they relate to marketing and public relations strategies (Ethical Consumer, 2020; Penddse *et al.*, 2023), an analysis of greenwashing and its effects on stakeholder perceptions and corporate reputation in Italy (Torelli *et al.*, 2020), the use of greenwashing indicators to assess the sustainability claims of food companies in Europe (Zanasi *et al.*, 2017), and the impact of environmental regulations on the competitive landscape of firms in the building and construction sector as well as in commercial industries in Europe (He *et al.*, 2022). Additionally, there is a growing consumer skepticism regarding the effectiveness of environmental claims in advertising, attributed to greenwashing practices (Yoon & Chung, 2018), and the development of regulatory frameworks for evaluating greenwashing (Nemes *et al.*, 2022). Arguably, there appears to be a lack of research examining the prevalence of greenwashing across different global regions and the effectiveness of mitigation strategies that integrate behavioural economics interventions with regulatory measures. The existing literature predominantly focuses on identifying and analyzing greenwashing and its negative effects within commercial sectors (See, for example, Torelli *et al.*, 2020; Ethical Consumer, 2020; Ioannou *et al.*, 2023). Consequently, this study aims to address this gap by investigating the advantages and challenges associated with the integration of both behavioural economics and regulatory interventions to reduce greenwashing on a global scale.

### **Different Manifestations of Greenwashing**

The tactics employed in greenwashing often encompass a range of strategies. One common approach involves companies utilizing vague labels such as “natural,” “green,” or “eco-friendly” without substantiating these claims with clear evidence or recognized certifications. For instance, products labelled as “biodegradable” may not actually decompose in typical environmental conditions, instead requiring specific industrial processes for their breakdown (Saha & Agrawal, 2020). This represents a concealed trade-off, where firms highlight a singular positive environmental feature of their products while neglecting other environmentally detrimental practices. A case in point is a company that markets a product made from recycled materials but fails to disclose that the manufacturing process is associated with high energy consumption or the emission of toxic substances (TerraChoice, 2022). Another manifestation of greenwashing is selective disclosure, where both governments and corporations reveal only environmentally beneficial initiatives while concealing the adverse environmental impacts of these activities. For

example, a company might advertise its recycling efforts without acknowledging the substantial carbon emissions generated during the recycling process (Nyirenda, 2022; Gatti *et al.*, 2022). Governments can also be implicated in greenwashing when they appear to support or address environmentally harmful practices but lack the necessary enforcement mechanisms (Gatti *et al.*, 2022). Furthermore, some nations may proclaim ambitious climate objectives without implementing effective strategies to realize these goals (Farooq & Rahman, 2019; International ICAP, 2022). The exploitation or misrepresentation of third-party certifications or endorsements is yet another aspect of greenwashing. For instance, companies may collaborate with weak certification bodies that lack transparency or provide inadequate environmentally friendly certifications (Farooq & Rahman, 2019). Additionally, the use of “green imagery” serves as a tactic to promote products under the guise of environmental responsibility. However, greenwashing has emerged as a significant challenge for ESG initiatives, as research seems to indicate that an increasing number of ESG funds are incorporating companies that do not genuinely adhere to principles of social and environmental accountability embedded in the ESG (Gatti *et al.*, 2021; He *et al.*, 2022). Furthermore, the problem of greenwashing also seems to affect Market-market-based compliance carbon and voluntary carbon markets.

## **LITERATURE REVIEW**

### **Theoretical Review**

This section outlines the theoretical frameworks underpinning this research, which helps understand the dynamic nature of greenwashing and the motivations behind organizations’ involvement in such activities.

### **Legitimacy Theory**

Legitimacy theory, as articulated by Dowling and Pfeffer (1975), posits that organizations strive to align their practices with societal norms and expectations in order to maintain their legitimacy. This theoretical framework suggests that companies might engage in greenwashing as a tactic to either preserve or regain their legitimacy, especially in environments where there is significant societal pressure for environmental responsibility (Deegan, 2019).

### **Institutional Theory**

In 1983, Paul DiMaggio and Walter Powell introduced the concept of institutional isomorphism, explaining how organizations adapt to institutional pressures for legitimacy (DiMaggio & Powell, 1983). In the context of greenwashing, this theory suggests that organizations adjust their practices to align with environmental norms to gain and sustain legitimacy.

### **Signaling Theory**

Signaling theory, developed by Michael Spence in 1973,

explains how individuals and organizations convey information in situations of information asymmetry, particularly in labour markets. It highlights how companies use signals to communicate with consumers, influencing their purchasing decisions (Spence, 1973). Greenwashing is a deceptive form of signaling where companies use environmental messaging to attract eco-conscious consumers without credible evidence of genuine environmental practices (Connelly *et al.*, 2011).

### Stakeholder Theory

Stakeholder theory, developed by Freeman in 1984, underscores the importance of organizations taking into account the interests of a diverse array of stakeholders rather than focusing solely on shareholders during their decision-making processes. This theory asserts that businesses need to acknowledge the needs of all relevant stakeholders, including consumers, employees, regulatory bodies, and the broader community, when making decisions (Freeman, 1984). In light of greenwashing, companies that resort to greenwashing often do so in response to pressures from stakeholders who advocate for environmentally responsible practices (Mitchell *et al.*, 1997).

### Empirical Literature Review

De Freitas Netto *et al.* (2020) undertook a systematic review to explore the development and conceptual understanding of greenwashing, investigating its diverse manifestations and consequences as a misleading environmental marketing strategy. The research delineates, categorizes, and assesses the effects of greenwashing on consumers, businesses, and the broader context of environmental sustainability. The authors analyzed peer-reviewed articles sourced from databases such as Scopus and Google Scholar, concentrating on publications from 1990 to 2019, and ultimately narrowed their focus to 108 pertinent studies. Anchored in legitimacy and signaling theories, the results reveal that greenwashing diminishes consumer trust, damages corporate reputations, and detracts from authentic sustainability initiatives. Furthermore, research by Ethical Consumer (2020) sheds light on the greenwashing phenomenon, indicating that it occurs when companies employ misleading marketing or public relations tactics to falsely portray themselves as environmentally responsible. The article highlights the motivations driving greenwashing, which often includes the desire to improve brand perception and attract environmentally conscious consumers while avoiding genuinely sustainable practices. Prominent companies, including Shell and HSBC, have faced criticism for their greenwashing efforts, encountering backlash for advertisements that misrepresent their environmental commitments. Additionally, brands like Boohoo and Coca-Cola have been called out for overstating their sustainability claims, particularly in industries such as fast fashion and plastic manufacturing. Ethical Consumer

(2020) provides guidance for consumers on how to identify greenwashing, recommending that they assess the true sustainability of a company's product offerings. Lyon and Montgomery's study (2015) explored the ethical and practical dimensions of greenwashing. The main goal was to understand how companies use greenwashing to create an illusion of environmental responsibility, often without implementing substantial environmental initiatives. The research classified various types of greenwashing and assessed their impact on corporate sustainability efforts. It highlighted the negative effects of greenwashing on genuine sustainability and consumer trust, offering important insights into the motivations and strategies behind these greenwashing practices.

Yoon and Chung (2018) examine how consumer scepticism affects the effectiveness of environmental claims in advertising, emphasizing the role of perceived corporate social responsibility (CSR) authenticity. Their study, involving 600 participants, reveals that higher perceived CSR authenticity reduces scepticism and enhances the effectiveness of environmental claims. They recommend that companies should focus on improving CSR authenticity to build trust. Similarly, Nemes *et al.* (2022) explore greenwashing in their work "An Integrated Framework to Assess Greenwashing," aiming to create a framework for understanding deceptive environmental claims. They identify 13 key themes related to greenwashing, such as exaggerated claims, and stress the importance of understanding the motivations behind it. The authors propose a structured methodology to help organizations, activists, and policymakers reduce greenwashing claims.

De Freitas Netto *et al.* (2020) studied the impact of greenwashing on consumer behaviour, focusing on scepticism towards companies' environmental claims. The authors found that such deceptive marketing undermines consumer trust in brands claiming sustainability. This scepticism arises from perceived dishonesty; when consumers doubt a brand's truthfulness about its environmental efforts, they are less likely to support it. The study highlights that perceived dishonesty can hinder the promotion of sustainable consumer behaviours. Guo *et al.* (2017) studied the link between environmental management regulations and corporate greenwashing, which involves misleadingly exaggerated sustainability efforts. The authors argue that stricter regulations are essential to reduce such practices, as they promote transparency in companies' environmental reporting. A research study conducted by Gillespie (2022) examines the influence of greenwashing on consumer behavioural intentions, focusing on mediating elements such as word of mouth (WOM) and corporate social responsibility (CSR). Through the application of structural equation modelling, the findings indicate that greenwashing exerts a negative indirect effect on behavioural intentions, with WOM and perceived CSR serving as mediators. This framework underscores the significance of social and

ethical integrity in marketing, illustrating how perceived dishonesty can be mediated in its effect on consumer intentions.

Margarita *et al.* (2024) investigate the impact of greenwashing on consumer attitudes and behaviours through a framework grounded in the theory of planned behaviour (TPB). Their findings indicate that although consumers demonstrate robust positive attitudes towards sustainable practices, these attitudes frequently fail to convert into actual purchasing decisions. This discrepancy is primarily attributed to apprehensions regarding greenwashing, which serves to moderate the connection between consumer attitudes and their intentions. Yang *et al.* (2020) present an extensive analysis of greenwashing and its implications for consumer trust, brand loyalty, and the credibility of eco-labels. The behavioural reactions to greenwashing, which frequently manifest as heightened consumer scepticism, can significantly damage brand reputation and weaken trust in authentic sustainability initiatives. The findings indicate that greenwashing may cause consumers to regard all environmental claims with suspicion, consequently reducing their propensity to buy sustainable products, even from firms that engage in genuine environmentally friendly practices. The UN Global Compact (2021) addresses the issue of greenwashing within the context of corporate sustainability reporting, emphasizing that inconsistent disclosures can create confusion among stakeholders. The report underscores the application of principles from behavioural economics, including framing effects, which companies may exploit to cultivate a positive environmental reputation. This strategy is frequently employed to appeal to investors who prioritize ESG criteria.

The European Environment Agency (2020) examines the regulatory landscape related to greenwashing and highlights the pressing need for policy measures to address misleading claims. The report notes the potential manipulation of cognitive biases, such as the halo effect, in greenwashing strategies, which can undermine consumer trust and diminish accountability in corporate sustainability efforts. Likewise, the OECD (2019) emphasizes the vital importance of transparency in environmental reporting and its influence on consumer confidence. The report cautions against the risks of greenwashing, which can take advantage of consumers' environmental concerns, particularly in markets with weaker regulatory frameworks. This highlights the significance of behavioural economics in understanding and tackling greenwashing practices.

### **Behavioural Economics in Framing Greenwashing Mitigation Policies**

Behavioural economics provides a robust framework for analyzing human behaviour and decision-making by incorporating insights from psychology and related disciplines like sociology (Sparkman & Walton, 2017).

In recent years, the influence of behavioural economics as an interdisciplinary field on public policy has significantly grown. This research aims to explore human behaviour and decision-making by merging knowledge from psychology and other behavioural sciences with economic theory. Foundational theoretical models that integrate cognitive and psychosocial perspectives with economic analysis demonstrate that decision-making processes are not only adaptable and flexible but are also heavily shaped by contextual factors. The literature highlights five key behavioural principles that greatly impact decision-making: limited cognitive resources, incorrect beliefs, present bias, reference dependence and framing, as well as social preferences and norms (World Bank, 2019; Myers & Souza, 2020). Behavioural economists have investigated ways to utilize insights into human behaviour to create policy interventions aimed at encouraging positive decisions, such as improving health outcomes, enhancing financial security, and promoting environmental sustainability (Jones, 2021; Messer *et al.*, 2023; National Academies of Sciences, NAS, 2023). This interdisciplinary field has gathered substantial evidence on the optimal timing, methods, and contexts in which principles and strategies from behavioural economics can improve the effectiveness of policymaking.

## **MATERIALS AND METHODS**

### **The Search Strategy, Inclusion and Exclusion Criteria**

The study employed a systematic literature review (SLR) methodology as outlined by De Freitas Netto *et al.* (2020), allowing researchers to contextualize their work within existing knowledge. The SLR method ensures the comprehensive identification of relevant studies while minimizing bias and subjectivity (Higgins *et al.*, 2021). The review followed PRISMA guidelines (Page *et al.*, 2021) and investigated greenwashing practices globally using a Boolean Proximity search to identify related terms such as “greenwashing,” “sustainability,” and “corporate social responsibility.” A mapping approach with VOS viewer software was used to create bibliometric networks based on citation metrics (Moya-Clemente *et al.*, 2021). The academic databases surveyed in this study comprised the Web of Science, Scopus, Google Scholar, JSTOR, Oxford Academic, and Springer. The search and analysis occurred between May and September 2024. The survey period of consideration is 15 years, from 2009 to 2024. The search focused on peer-reviewed articles published in English on greenwashing. In recent years, a significant number of academic journals have transitioned from traditional print formats to online publications, implementing open-access policies that allow readers to access their content without charge. This shift is predicated on the belief that it will enhance the readership and accessibility of published research. This study focused on articles in the open-access model.

### Findings and Discussions

The search yielded a total of 2,332 articles. Specifically, 409 articles were identified from the Web of Science (WOS), 371 from SCOPUS, and Google Scholar emerged as the leading source with 747 peer-reviewed articles related to greenwashing. Additionally, JSTOR contributed 92 papers on the subject within the 15-year timeframe from 2009 to 2024. The search also revealed 63 articles from Oxford Academic and 243 from Springer. During the screening phase, it was noted that 171 articles were duplicates found across various academic databases, while 41 articles were found to be abridged, and 22

articles addressed climate change mitigation rather than greenwashing. Consequently, the total number of excluded articles, which included duplicates, abridged works, and those focused on general climate mitigation, amounted to 234. This resulted in a final sample of 2,098 articles selected from the six afore mentioned academic databases. Figure 1 shows the flow chart of the article selection process.

Table 1 reports the number of publications by specific world regions, the frequent industries or sectors where studies were concentrated and the total number of citations.

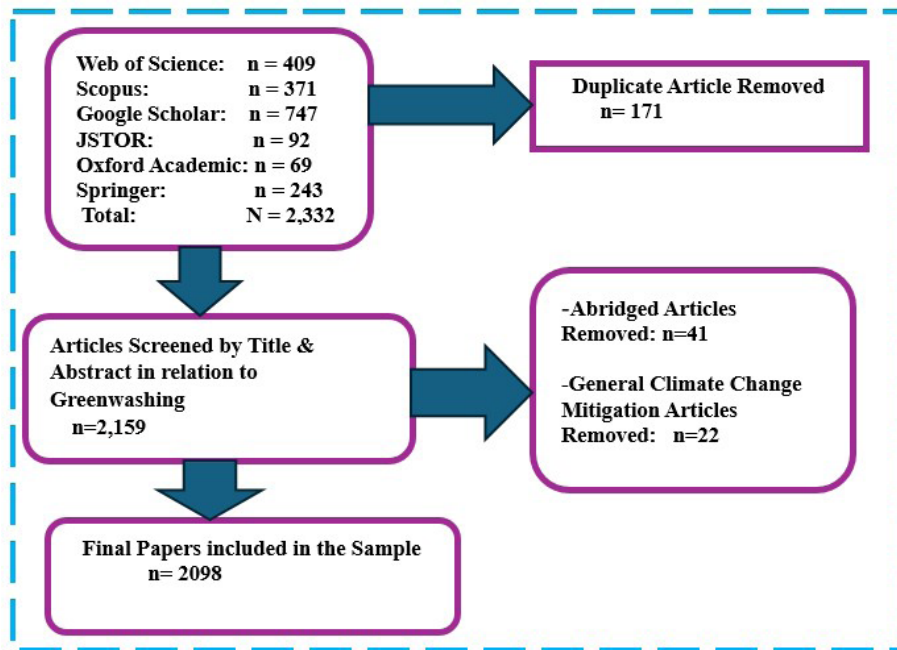


Figure 1: PRISMA 2021 Flow Diagram: Article Identification and Selection Processes

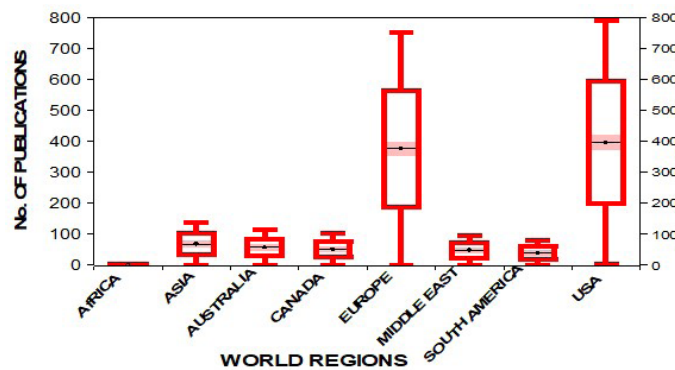
Table 1: Distribution Publications on Greenwashing by World Regions , 2009-2024

Region	No. of Publications	Frequent Industry/Sectors of Focus of Research	Total Number of Citations
The USA	772	Energy, Food, Automotive, Fashion	4713
Europe	751	Energy, Fashion, Construction & Real Estate, Food	3977
Canada	102	Energy, Fashion, Transport, Construction & Real Estate	1633
Australia	114	Energy, Fashion, Food & Beverage, Construction & Real Estate	989
Africa	46	Energy, Agriculture, Mining, Fashion, Tourism, Fashion	321
Middle East	97	Energy, Fashion, Construction & Real Estate, Food	305
Asia	137	Energy, Automotive, Construction & Real Estate, Tourism, Agriculture	2382
South America	79	Energy, Tourism, Mining, Agriculture & Agri-Business	504

Source: Author's Elaboration on Literature Review

From Table 1, it is easy to observe that the common sector (or industry) where studies on greenwashing frequently focus in all eight (8) world regions is the energy sector. The fashion industry ranks second in

terms of the frequency of studies, and the food industry ranks third. Figure 2 reports the Boxplot of the total number of peer-reviewed publications per region reported in Table 1.



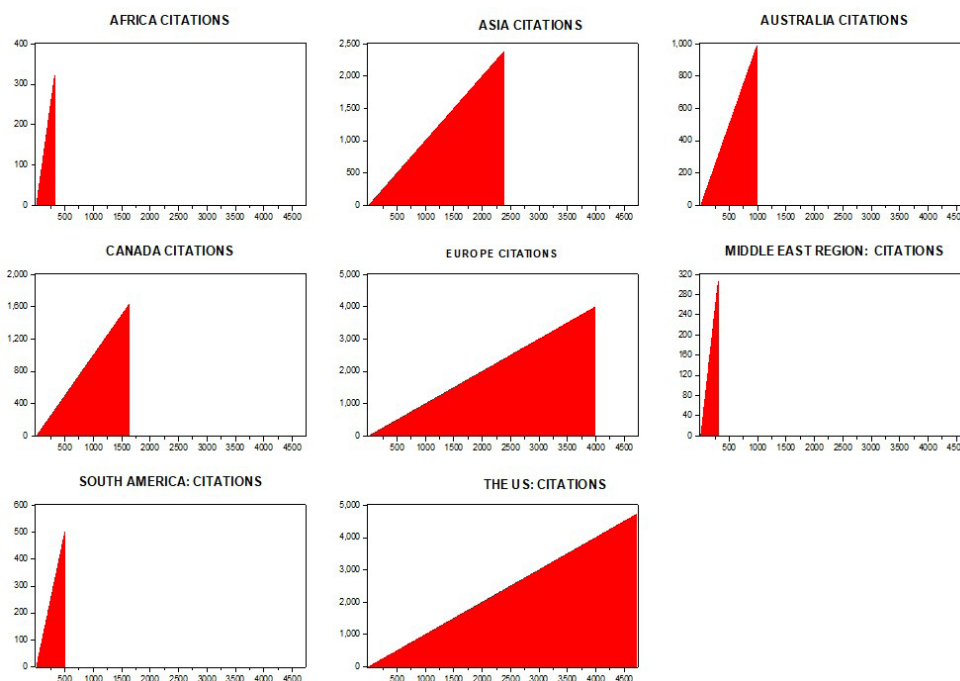
**Figure 2:** Boxplot of number of publications per region, 2009-2024

As can easily be observed from Figure 2, given that the length of the boxes denotes the spread of the middle 50% of the data, it is clear that the the United States region (USA) has the publication data lying between 200 and 800 with a mean of 400 publications, whereas the European region has the bulk data lying between 200 and 550 with a mean of 390 publications on greenwashing in 15 year period (2009-2024). For Asia, the mean number of publications is 50, whereas for Australia, it is 48. For the Middle East, the mean is 35, with South America’s mean publications standing at 20. The mean number of publications for the African region is negligible relative to other regions.

Assuming that co-authorship from across the world regions is negligible and that the number of publications focusing on a particular region loosely indicates the

prevalence of greenwashing, it can be inferred that the prevalence of greenwashing is highest in the US region at 36.8 percent, followed by the European region at 35.8 percent. The Asia region ranks third at 6.5 percent, while Australia and Canada rank fourth and fifth at 5.4 percent and 4.9, respectively. The Middle East ranks sixth at 4.6 percent. South America ranks seventh at 3.8 percent, with the African region ranking eighth at 2.2 percent.

Figure 3 shows a graphical representation of the number of citations per region reported in Table 1. Again, assuming that co-citations from across the world regions are negligible, it seems that, on average, the US region ranks first in terms of greenwashing publications, albeit also in terms of greenwashing tactics, covering a maximum of 4500 units of the surface area, Europe ranks second at 3990 units of the area.



**Figure 3:** Number of Citations per region, 2009-2024

Notes: The vertical values represent the total number of citations (height), while the horizontal values represent the total surface area covered by citations in each region

The Asian region ranks third with 2450 units of surface area, whereas Canada ranks fourth with 1700 units of surface area. Australia ranks fifth with 1000 units of surface area.

### **Selected Case Studies on Greenwashing from Across the World Regions**

#### **The US Region (USA)**

Greenwashing seems to be a significant issue in North America, especially in the U.S. The Federal Trade Commission (FTC) has introduced the Green Guides to combat misleading environmental claims, but enforcement has been inconsistent (FTC, 2012). Companies often take advantage of varying regulations across states and sectors. For instance, the fossil fuel industry promotes “clean energy” initiatives while heavily investing in non-renewable sources (Shen, 2020). The packaging sector also engages in greenwashing by using vague terms like “biodegradable” without specifying biodegradation conditions (Saha & Agrawal, 2020). The energy sector frequently highlights its renewable efforts while downplaying fossil fuel reliance, as seen in Chevron’s “We Agree” campaign, which masked its substantial investments in fossil fuels despite minimal funding for renewables (Simpson, 2020). The fashion industry is similarly known for its negative environmental impact. Many brands promote “sustainable” collections using vague terms like “eco-friendly” without proof. For instance, a fast-fashion retailer faced criticism for claiming to use sustainable materials while being linked to environmentally harmful suppliers (Jones, 2021). The food industry has also seen greenwashing, with Kellogg’s accused of misleading marketing for its cereals, as investigations revealed harmful agricultural practices among its suppliers (Smith & Johnson, 2022). The automotive sector has faced similar issues, notably Volkswagen’s Dieselgate scandal, where the company used “defeat devices” to falsely present its diesel vehicles as eco-friendly, leading to emissions far exceeding legal limits (Ewing, 2017). General Motors also faced backlash for marketing the Chevrolet Volt as eco-friendly despite its heavy reliance on gasoline (Bachnik, 2021). The United States has put in place various regulatory frameworks to tackle the problem of greenwashing, but the enforcement of these regulations is often inconsistent. The Federal Trade Commission (FTC) oversees environmental marketing claims through its Green Guides, which provide companies with guidelines to avoid making misleading environmental statements. However, critics argue that the FTC lacks the necessary resources and authority to effectively combat greenwashing on a larger scale (FTC, 2012). These cases highlight the need for stronger regulations and enforcement mechanisms to hold corporations accountable for misleading environmental claims in the US.

#### **The European Region**

Greenwashing poses a significant challenge in Europe,

driven by the increasing consumer demand for sustainable products. Many brands promote “sustainable” collections using vague terms like “eco-friendly” without proof. For instance, a fast-fashion retailer faced criticism for claiming to use sustainable materials while being linked to environmentally harmful suppliers (Jones, 2021). To address the issue of greenwashing in Europe, it is essential to adopt a multifaceted approach that includes regulatory interventions, consumer education initiatives, and self-regulation within the industry. Governments are pivotal in this effort, as they can establish more stringent regulations and enforcement protocols to ensure that companies are held responsible for their environmental assertions. Furthermore, consumer advocacy groups can enhance public awareness regarding greenwashing and offer strategies for consumers to recognize and steer clear of deceptive claims. Lastly, industry associations could create voluntary standards that promote transparency and accountability (European Commission, 2020)

#### **The Canadian Region**

Greenwashing is a widespread phenomenon in numerous industries in Canada. While industries such as energy, fashion, food and beverage, transportation, and construction have implemented legitimate sustainability efforts, the absence of adequate transparency and regulatory measures has facilitated the pervasiveness of greenwashing practices. The Canadian energy sector, particularly the oil and gas industry, has faced allegations of greenwashing. As a leading global oil producer, many Canadian companies claim to be environmentally friendly by promoting their renewable energy investments. However, critics argue that these claims often exaggerate their environmental efforts, distracting from the industry’s broader impacts (Schwarz & Barth, 2020). Suncor Energy, a key player in Canada’s energy sector, has invested in renewable sources like wind and biofuels. However, a Pembina Institute report (2017) highlighted that Suncor’s heavy reliance on oil sands operations significantly contributes to greenhouse gas emissions. (Pembina Institute, 2017). In Canada’s food and beverage industry, companies are increasingly integrating sustainability into their branding. Many organizations promote organic and sustainable practices, but some face scrutiny for unverified claims. For example, Tim Hortons, Canada’s largest coffee chain, has launched campaigns to showcase its sustainability efforts, such as reducing single-use plastics and responsible coffee sourcing. However, it has been criticized for a lack of transparency, with research from the Canadian Center for Policy Alternatives (2018) suggesting that its sustainability claims may prioritize marketing over genuine environmental responsibility, raising concerns about greenwashing. Similarly, General Motors (GM) Canada promotes its electric vehicle (EV) initiatives while still profiting significantly from gasoline-powered vehicles, leading to accusations of greenwashing as the focus on EVs may distract from

the environmental impact of its entire vehicle lineup (Environment and Climate Change Canada, 2020; Bachnik, 2021). Consequently, the Canadian Competition Bureau has initiated investigations and imposed penalties on companies that make false environmental assertions; however, the approach to enforcement has tended to be reactive rather than proactive (Competition Bureau Canada, 2018).

### The Australian Region

Greenwashing is a growing concern in Australia, with many companies across various industries accused of misleading environmental claims. As consumer awareness rises, sectors like energy, fashion, food, and construction increasingly label their products as “green” or “eco-friendly.” The energy sector has seen notable instances of greenwashing, particularly with companies like AGL, which, despite claiming to lead in renewable energy, is one of the country’s top carbon emitters due to its coal-fired power generation. Similarly, Origin Energy faces skepticism for promoting its green energy while heavily investing in fossil fuels. The Australian fashion industry has faced greenwashing criticisms, with many brands promoting “sustainable” collections that often lack substance. For example, Cotton On has been criticized for its “eco-range,” which lacks transparency about its supply chain and environmental impact (Smith & Johanson, 2021). Similarly, the food and beverage sector, especially the meat industry, has been accused of greenwashing. Research shows that Australian meat and dairy producers’ market themselves as environmentally responsible while engaging in practices that harm the environment, such as deforestation and carbon emissions (Ridoutt *et al.*, 2016). Woolworths, for instance, has promoted its meat as “sustainably sourced” without sufficient evidence (Choice, 2019), raising concerns about misleading consumers. The construction and real estate sectors are also implicated in greenwashing, with many firms claiming to use environmentally friendly methods while failing to implement key practices like water conservation and energy efficiency in their “green buildings.” (Hopkins & Carey, 2022).

In response to concerns about greenwashing, the Australian Competition and Consumer Commission (ACCC) has increased scrutiny of environmental claims. In 2020, the ACCC issued guidelines to help businesses make truthful assertions and avoid misleading consumers. Consumer advocacy groups like Choice have also played a key role in identifying greenwashing practices. However, many Australians struggle to distinguish between genuine and greenwashed products, underscoring the need for stronger regulations and greater transparency in corporate communications.

### The African Region

In Africa, the phenomenon of greenwashing is increasingly becoming a pressing concern. The continent grapples with

substantial environmental issues such as deforestation, climate change, and the decline of biodiversity. In response to these challenges, there has been a surge in corporate assertions of environmental stewardship linked to the pursuit of sustainable development. Renewable energy is increasingly recognized as a vital strategy for alleviating energy poverty and diminishing reliance on fossil fuels. Nevertheless, certain corporations have faced allegations of greenwashing by exaggerating their roles in the advancement of renewable energy. Many oil and gas companies in Nigeria, including Shell, are investing minimally in solar energy while expanding oil extraction, leading to significant environmental damage (Damilola, 2021). In North Africa, countries like Algeria and Libya rely heavily on fossil fuels despite international calls for renewable energy, with firms often accused of greenwashing (Chibane & Harbi, 2022). The mining sector in Sub-Saharan Africa, vital to the economy, also faces criticism for environmental harm. Companies like AngloGold Ashanti engage in greenwashing through CSR initiatives, promoting reforestation while local communities suffer from water contamination and land degradation (Hilson, 2019). Eco-tourism is growing in the region, but some operators are also accused of greenwashing, promoting minimal environmental impact while engaging in harmful practices. Insufficient regulatory frameworks and low consumer awareness have led to widespread greenwashing. However, civil society movements and environmental advocacy groups are demanding greater transparency and accountability. A major challenge in Africa is the lack of strong regulatory systems to oversee corporate environmental claims. While countries like South Africa, Morocco, Ghana, and Kenya have made progress in environmental regulations, enforcement remains weak in many areas. Nonetheless, civil society organizations are increasingly calling for greater corporate accountability (Ogola & Abebe, 2021). Future efforts should focus on strengthening regulations and encouraging consumers to evaluate corporate environmental claims critically.

### The Middle East Region

The Middle East is recognized for its abundant natural resources, particularly oil, while simultaneously grappling with significant environmental issues such as water scarcity, desertification, and elevated carbon emissions. The oil and energy sectors in this region is particularly susceptible to greenwashing practices. Despite a heavy dependence on fossil fuel extraction, numerous companies have sought to portray themselves as environmentally conscious. Saudi Aramco, one of the world’s largest oil companies, faces criticism for promoting carbon capture and renewable energy while heavily producing oil (Clark, 2020). Research by Toufic *et al.* (2021) shows that many Gulf Cooperation Council (GCC) oil companies tout renewable energy investments in their reports but lack transparency about their total carbon emissions. The

real estate and construction sectors in the Middle East are also accused of greenwashing, with developers in rapidly expanding cities like Dubai and Doha marketing projects as “eco-friendly” despite often overlooking the environmental impacts of urban development (Samer, 2019). The fashion and retail sector, particularly fast fashion brands like Zara and H&M, has been criticized for promoting eco-friendly lines that represent only a small fraction of their production, which remains tied to unsustainable practices (Ameen & Abu-Jarad, 2021). While some companies in this region have made genuine efforts towards sustainability, others often exaggerate or misrepresent their environmental claims (Alshuwaikhat & Mohammed, 2020). As the region develops and becomes more sensitive to tactics of greenwashing, there is a growing need for stricter regulations, increased transparency, and more robust third-party certifications to combat greenwashing and promote true environmental accountability (Toufic *et al.*, 2021)

### The Asian Region

As Asia undergoes significant economic expansion, numerous sectors throughout the region are increasingly prioritizing sustainability within their marketing and operational frameworks. The energy industry, particularly in nations like China and India, has faced criticism for engaging in greenwashing. Major energy corporations have been accused of misrepresenting their sustainability efforts while still heavily depending on fossil fuels. For example, PetroChina has advertised its investments in renewable energy, yet a substantial portion of its operations remain focused on oil and gas. Although the company has declared intentions to enhance its clean energy usage, environmental advocates have highlighted that a considerable amount of its energy output continues to derive from non-renewable sources (Shen *et al.*, 2021). A similar trend is evident in India’s coal sector, where firms such as Coal India Limited promote minor environmental initiatives while maintaining a dominant position in the coal industry (Ramana & Sharma, 2020). The food and beverage sector in Asia has experienced a growing recognition of sustainability issues, accompanied by an increase in greenwashing practices. Although the company advocates sustainable agricultural methods, research conducted by Kawamura *et al.* (2021) revealed that it relies heavily on plastic packaging, thereby compromising its environmental claims. Similarly, the automotive industry in Asia has also been marked by instances of greenwashing. Leading car manufacturers in Japan and South Korea are committed to developing environmentally sustainable vehicles, yet they still contribute significantly to carbon emissions. For instance, while Toyota is recognized for its hybrid and electric innovations, it remains heavily reliant on gasoline-powered vehicles, particularly in the Asian market (Kim *et al.*, 2020). Southeast Asia attracts millions of tourists to countries like Thailand, Malaysia, and the Philippines, and

the tourism sector is increasingly adopting sustainability marketing. However, some companies face accusations of greenwashing by exaggerating their eco-friendly initiatives. Thailand is widely recognized for its eco-tourism efforts, with numerous resorts and hotels promoting sustainable practices. However, a study by Nithart and Yuberik (2019) found that many hotels in Phuket and Chiang Mai falsely claimed to be eco-friendly by stating they had adopted sustainable energy solutions and waste management systems that were either non-existent or minimal. Case studies from Indonesia, Malaysia, Thailand, Japan, South Korea and Vietnam highlight the challenges of addressing greenwashing in this region. To mitigate the negative consequences of greenwashing on both the environment and society, it is crucial to establish stricter regulatory frameworks and improve consumer awareness (Kim *et al.*, 2020; Zhao *et al.*, 2022).

### The South American Region

In the South American context, multiple industries have been associated with greenwashing practices, especially as the demand for sustainable initiatives rises. The energy sector, particularly in oil-abundant nations such as Venezuela, Ecuador, and Brazil, has been embroiled in several greenwashing controversies. Despite the public relations efforts of major oil corporations to showcase their dedication to renewable energy, a significant portion of their financial resources remains directed towards fossil fuel extraction. A pertinent example from Ecuador involves Petroamazonas, an oil enterprise that has touted its “responsible” oil extraction methods in the Amazon region. However, investigations by environmental organizations revealed that the company’s activities were causing considerable pollution and damaging local ecosystems (Vallejo *et al.*, 2015). These misleading promotional tactics, which include assertions of “minimal environmental impact,” have been criticized as overt greenwashing, intended to obscure the detrimental consequences of oil extraction in the Amazon basin (Cisneros, 2020). In a similar vein, Petrobras, Brazil’s state-owned oil company, has publicized its renewable energy initiatives while simultaneously broadening its oil drilling activities. This has resulted in allegations of greenwashing, particularly given Petrobras’ history of significant oil spills along the Brazilian coastline (Magalhães, 2020). The mining sector in South America has encountered considerable scrutiny regarding its greenwashing tactics. Mining firms frequently emphasize their corporate social responsibility (CSR) efforts, such as initiatives for reforestation and water management, while minimizing the severe environmental degradation resulting from their primary operations. A notable example is the Peruvian mining enterprise Yanacocha, which has promoted its commitment to environmental stewardship and community involvement despite facing accusations of water pollution and violations of human rights (Bebbington *et al.*, 2018). The agricultural and

agribusiness sectors in South America, especially in Brazil and Argentina, face criticism for greenwashing. Companies often market their products as eco-friendly while contributing to deforestation and biodiversity loss (Brancalion *et al.*, 2016). Many companies selectively report on deforestation, focusing on legal compliance while ignoring the environmental damage from monoculture and land conversion (Sauer, 2018). Government responses have been inconsistent; while some countries have regulations against deceptive marketing, enforcement is often weak (Pizarro *et al.*, 2020). The overarching goal of this study is to explore the

prevalence of greenwashing across the world regions and consider ways of mitigating greenwashing through the proposed interventional frameworks. The European and the US seem to be taking a leading role in formulating greenwashing regulatory policies, evidently because of the prevalence of greenwashing in these regions (See Table 1), while other regions, especially from the emerging and developing country categories, are lagging behind. Table 2 outlines key similarities and differences between behavioural economics Interventions and regulatory interventions in curbing greenwashing.

**Table 2:** Key Similarities & Differences between Behavioural & Regulatory interventions

Similarities	Differences
<p><b>Objective to Enhance Transparency</b></p> <p>➤ Both strategies are designed to foster consumer confidence by mandating companies to deliver truthful environmental data (Jackson &amp; Smith, 2021).</p>	<p><b>Compliance Strategies</b></p> <p>➤ Behavioral Approaches: Emphasize non-coercive techniques, prioritizing incentives over punitive measures.</p> <p>➤ Legal Approaches: Governed by statutory requirements, focusing on penalties to discourage non-compliance (Jones &amp; Dupont, 2022).</p>
<p><b>Emphasis on Mitigating Deceptive Claims</b></p> <p>➤ Both approaches strive to mitigate overstated environmental assertions (greenwashing), in accordance with the objectives of sustainable development goals (SDGs).</p>	<p><b>Adaptability versus Strictness</b></p> <p>➤ Behavioral Economics: Characterized by a greater degree of flexibility, permitting companies to engage in some level of self-regulation.</p> <p>➤ Regulatory Standards: Defined by stringent criteria, which may lack the adaptability necessary to accommodate diverse contexts across different industries (Green <i>et al.</i>, 2020).</p>
<p><b>Reliance on Consumer Knowledge</b></p> <p>➤ Both depend on education or awareness of the populace for their success, as regulatory measures alone are insufficient to combat greenwashing if consumers lack awareness of such practices (Lee <i>et al.</i>, 2019).</p>	<p><b>Global Effectiveness</b></p> <p>➤ Behavioral Economics: Typically constrained by local cultural practices.</p> <p>➤ Regulatory Systems: Possess the potential for broader applicability, particularly when aligned with international standards (e.g., ISO 14020).</p>

Source: Author's elaboration on various literature cited in the Table

The systematic reviews and the review of the selected case studies from across the world regions seem to suggest that the common intervention in curbing greenwashing activities is the regulatory approach. It appears that there is a dearth of studies regarding behavioural economics interventions with respect to greenwashing. Additionally, the regulatory approach to mitigating greenwashing seems to be in its infancy, given the slow pace and fragmented approaches at which such regulations have been formulated and enforced across the world regions. It is worth noting that the objective of conducting systematic reviews and case studies was not to replicate the systematic reviews but to build on the outcome and gain insights on how to propose frameworks on how to mitigate the rising greenwashing activities around the globe.

**Integrated Behavioural-Legal Framework to Mitigate Greenwashing Across the World Regions**

The proposed framework in Table 3 integrates principles from behavioral economics with regulatory approaches,

recognizing both the similarities and differences in their methods for addressing greenwashing. The dual strategy aims to enhance consumer transparency, address deceptive claims, and leverage consumer awareness to create effective mitigation strategies suited to different regions.

It should be noted that international standards for environmental claims, such as ISO 14020, provide a uniform regulatory framework that facilitates global collaboration and comparability. The proposed interventional framework is premised on the significance of social and ethical integrity. However, insights from behavioral economics highlight the importance of accounting for local contexts. Consequently, policymakers ought to tailor their interventions to reflect regional and cultural variations in order to enhance their efficacy. In addition, the proposed framework in Table 3 serves as an initial foundation and can be adapted to address the unique contexts and challenges faced by various world regions with respect to the challenges of greenwashing.

**Table 3:** Intervention Framework to Mitigate Greenwashing Across the World Regions

Framework Component	Regulatory Policy Intervention	Behavioural Policy Intervention	Comment
Transparency -Enhancement Initiatives	This aspect encompasses obligatory disclosures, wherein organizations must communicate their environmental effects using standardized metrics and labels	Behavioural economics can play a supportive or complementary role by establishing opt-in initiatives that incentivize companies for their transparent reporting practices, thereby encouraging ethical conduct through subtle persuasion rather than overt compulsion	Both behavioural and regulatory strategies aim to enhance transparency as a means to mitigate greenwashing and foster consumer confidence (Jackson & Smith, 2021) This framework component may be achieved through: (i) Transparency Labels and Certifications: Organizations would be encouraged to obtain internationally recognized certifications like ISO 14020, which would help consumers easily identify credible eco-friendly products. (i i) Digital Transparency Portals: Create a centralized platform for consumers to access environmental impact assessments of products, combining regulatory oversight with accessible information to build trust. For example, the EU’s “Green Claims Initiative” mandates standardized environmental claims on packaging, aiding consumers in distinguishing genuine eco-friendly products from greenwashing (European Commission, 2020).
Public Awareness and Consumer Education Programs	Regulatory agencies have the opportunity to launch educational initiatives focused on environmental labelling and sustainable practices, thereby assisting consumers in distinguishing between authentic and misleading claims (Lee <i>et al.</i> , 2019).	Behavioural economics underscores the significance of consumer awareness in recognizing greenwashing practices. Furthermore, the implementation of social norm campaigns that highlight eco-friendly products or services compliant with regulatory standards can encourage consumers to favor genuinely sustainable brands.	Both strategies rely on consumer awareness to mitigate the risks of greenwashing, as regulatory frameworks alone are inadequate if consumers lack knowledge of deceptive practices (Lee <i>et al.</i> , 2019). (i) Public Awareness Initiatives: Implement behavioural nudges within public initiatives aimed at educating consumers on how to discern credible environmental claims. This could include educational advertisements sponsored by governmental bodies or non-governmental organizations that emphasize the identification of “eco-friendly” terminology that may suggest greenwashing (Lee <i>et al.</i> , 2019; Gomes, 2022). (i i) Integration of Sustainability Education in Educational Curricula: By embedding topics related to sustainability and consumer rights into educational programs, younger individuals can cultivate a critical perspective on corporate environmental assertions. For instance, in Canada, environmental advocacy groups partner with educational institutions to instruct students on how to critically evaluate green labels, thereby equipping them to become knowledgeable consumers from an early age.
Differentiated Compliance Strategies	The implementation of enforcement mechanisms, including fines and penalties for deceptive environmental claims, can serve as a deterrent, thereby promoting alignment between corporate conduct and sustainable practices (Jones & Dupont, 2022).	In order to encourage voluntary adherence to environmental standards, policymakers may consider the introduction of non-financial incentives, such as certifications or favourable media coverage for organizations that achieve elevated environmental benchmarks	(i) Promote Sustainable Innovations (Behavioral Economics): Implement tax breaks or financial grants for organizations that openly disclose their environmental impacts and adhere to verified sustainable practices. This strategy leverages behavioural economics by fostering compliance through positive incentives rather than punitive measures. (i i) Sanctions for Non-Adherence (Regulatory): Introduce rigorous sanctions for firms that engage in greenwashing. Such sanctions may include financial penalties and compulsory public retractions of misleading claims, thereby ensuring compliance with international standards. For example, the framework established by the U.S. Federal Trade Commission, known as the “Green Guides,” outlines the criteria for making environmental claims and imposes penalties on companies that partake in greenwashing. This regulatory framework is complemented by financial incentives that promote transparency (The Federal Trade Commission, FTC, 2012; Jones & Dupont, 2022).

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Adaptable Versus Strict Criteria</p>	<p>Rigorous regulatory frameworks such as the ISO 14020 series offer a systematic method that guarantees compliance across different industries, thereby improving global relevance (Green <i>et al.</i>, 2020).</p>	<p>The flexibility inherent in behavioural approaches facilitates adaptability and self-regulation, rendering them particularly effective in sectors characterized by rapid transformations or varied cultural environments. For instance, community-specific initiatives can highlight behaviours that resonate with local values (Green <i>et al.</i>, 2020).</p>	<p>Behavioural strategies facilitate flexibility and cultural awareness, whereas regulatory frameworks ensure rigorous enforcement across various regions (Green <i>et al.</i>, 2020).</p> <p>(i) Culturally Tailored Behavioral Initiatives: Customize behavioural interventions to align with specific cultural settings, employing localized language and symbols to convey what constitutes genuine environmental claims effectively.</p> <p>(ii) Global Regulatory Frameworks: Embrace standards such as ISO 14020 and synchronize national regulations with international benchmarks to promote uniformity. In areas with limited regulatory oversight, introduce incremental increases in regulatory demands to support industry development. For instance, in Japan, local governments adopt ISO guidelines to fit the Japanese language and cultural nuances, integrating behavioural campaigns that resonate with local sustainability values (Green <i>et al.</i>, 2020)</p>
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Source: Author's elaboration on various literature cited in Table 3

Furthermore, this study recommends comprehensive Life Cycle Assessments (LCA) and advocates green marketing based on verifiable data and transparent communication.

## CONCLUSION

This research examines the prevalence of greenwashing across global regions and proposes strategies to mitigate it through an intervention framework. Using a systematic literature review (SLR) and VOS viewer software for bibliometric analysis, the study follows PRISMA guidelines. Boolean Proximity searches identified terms related to greenwashing, and a targeted survey assessed affected sectors. The study analyzed 2,098 peer-reviewed articles from databases like the Web of Science and Scopus, covering 2009 to 2024. Findings show that the energy sector is most impacted by greenwashing, followed by fashion and food. The U.S. has the highest greenwashing rate at 36.8%, followed by Europe at 35.8%, and Asia at 6.5%. Australia and Canada follow at 5.4% and 4.9%, respectively, with the Middle East at 4.6%, South America at 3.8%, and Africa at 2.2%. Therefore, the study proposes an interventionist framework to tackle greenwashing across the world regions that integrate insights from behavioural economics with regulatory approaches, recognizing both the similarities and differences in their methods for addressing greenwashing. The dual strategy aims to enhance transparency for consumers, address deceptive claims, and leverage consumer awareness to create effective greenwashing mitigation strategies suited to different regions. It is envisaged that this research contributes to the evolving literature on environmental, social and governance (ESG) and greenwashing mitigation efforts. This study contributes to the body of literature on environmental, social, and governance (ESG) issues and strategies to address greenwashing. The findings in this study have important implications for corporate conduct and environmental ethics, advocating for a multidisciplinary approach, including behavioural economics, to tackle greenwashing. The study also highlights the necessity for corporate and governmental leaders to carefully evaluate the risks and potential long-term reputational damage associated with greenwashing. As ESG investing gains prominence, the insights from this research can aid in assessing the genuineness of corporate sustainability initiatives, ultimately leading to more informed investment choices and effective greenwashing mitigation efforts.

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