

Review

Some Countries Can Say “No!” to Single-Use Plastics, Others Cannot: Why Do Seemingly Similar Policies Have Different Outcomes?

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ABSTRACT

Despite the increasing awareness and concerns about plastic pollution, plastic packaging and single-use plastic (SUP) consumption continues to increase yearly. Even developed countries fail to adequately, let alone comprehensively, recycle the wide variety of plastic waste. Consequently, many countries have imposed levies or bans to curb the reliance on SUP, initially targeting single-use plastic bags and, in later stages—extending their legislation to other SUPs. However, only a few countries have succeeded in instilling persistent changes in plastic packaging consumption habits. Several key factors can drive behavioral changes, including stakeholder engagement in policy development, public education and awareness raising, accessible and affordable plastic alternatives, and a robust deposit-return system with adequate infrastructure. Taking as an example case studies from 12 countries, this paper aims to understand what underpins the success or underlies the failure of seemingly similar legislative approaches toward minimizing plastic bag consumption. To complete this analysis, peer-reviewed journals, governmental pages and reports were consulted to gather information about various plastic bag and later—other SUP bans and levies. This paper discusses in depth why and how satisfactory results fail to emerge if the above-mentioned measures are neglected. Importantly, from the case studies analyzed, this paper argues that the efficacy of plastic reduction legislation is contingent upon the degree of retail sector engagement rather than the specific policy instrument deployed.

Open Access

Received: 10 April 2024

Accepted: 20 December 2024

Published: 07 January 2025

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KEYWORDS: plastic bag; legislation; levy; ban; behavior

ABBREVIATIONS

SUP, single-use plastic

INTRODUCTION

Approximately 50% of manufactured plastics are for single-use applications, such as packaging, disposable consumer items and agricultural films [1]. Despite almost 90% of European citizens expressing concern about the environmental impact of everyday plastic products [2], and a global surge in awareness of plastic pollution driven by visible litter [3–5]; plastic consumption habits persist. The preference for single-use items over reusable alternatives remains prevalent [2,4,6–9].

Plastic waste mainly consists of different types of plastics, blends or multi-layered materials used for packaging purposes and various types of single-use plastics (SUPs), including plastic carrier bags, water bottles, containers and films, and different personal care items that are used routinely, despite a pronounced awareness of increasing plastic pollution. The replacement of traditionally used materials (e.g., glass, metal, ceramic) by plastic and the increase in its consumption is not only related to the rise in population and access to a consumer society but mainly because of plastic's versatile physical and chemical properties, simple manufacturing, and a wide range of applications at a lower cost than traditional alternatives [10]. Plastic bags have also become an indispensable part of the retail business and are often considered an essential part of customer service. Therefore, the root of plastic pollution stems not so much from overpopulation as from overconsumption in the wealthiest countries [11].

Single-use plastic carrier bags embody many plastic features, including strength while being lightweight, water resistance, resilience against natural decay processes, and low production costs. These properties have transformed plastic bags into an indispensable part of our everyday lives. Despite their theoretical recyclability, recycling single-use plastic bags is hindered by their lightweight nature, which complicates material accumulation, and their propensity to become entangled in the recycling equipment. This often necessitates halting the entire recycling process for manual removal [12].

In 2020, 61% of the collected post-consumer plastic waste originated from packaging applications [13], while in Europe, just ~41% of plastic packaging waste was being recycled in 2019 [14]. Approximately 85% of global marine litter is derived from plastic [15], and based on the estimations made in 2015, 10% of all annually produced plastic ends up as debris in the marine environment, shedding microplastics (defined as particles with a diameter range between 0.1 μm to 5 mm) [16]. Microplastics are now omnipresent, being also detected in all tested samples of human placenta [17,18], testes [19] and penises [20], blood [21], breast milk and meconium [18], stool [22], lungs [23] and heart [24]. While evidence concerning the effect on human health is still being collected, the initial results indicate that microplastic presence in the arteries is linked to heart diseases and may, therefore, increase the risk of death [25]. These data raise concerns about plastic pollution and microplastic's negative effect on human health and ecosystems.

With widespread and uncontrolled plastic packaging consumption, the global waste management system struggles to cope with the growing volume of different plastic waste materials [26]. Increasing concerns about plastic pollution have pushed many policymakers around the globe to implement different legislative strategies to curb plastic bag and other SUP consumption. However, only a few have resulted in the implemented legislation's successful and intended outcome.

While there have been studies listing different plastic bag reduction policies and their outcomes around the world or country-specific studies analyzing the reasons for the success or failure of the public policies on a local scale, there have been no comparisons of similar legislations between countries to try to understand what could be the main factors that affected the outcomes. This review paper aims to understand, through the lens of single-use plastic bag consumption, the short- and long-term effects of different single-use plastic reduction policies and to understand which factors created challenges or determined their success. Given the limited number of peer-reviewed studies evaluating the long-term impacts of plastic reduction policies, this research selected case studies from 12 different countries spanning Europe (Ireland, Portugal and Greece), Africa (South Africa, Zimbabwe, Botswana, Rwanda), Oceania (Australia), Asia (Nepal, China and India) and North America (Canada). Countries were chosen based on diverse policy approaches, legislative trajectories, policy outcomes, and the availability of local scientific evaluations considering unique national contexts, norms and consumer habits. Therefore, selected countries were chosen to ensure representativeness across continents, cultures, and economies.

Numerous studies have examined factors influencing sustainable consumption habits and the role of retailers in promoting green consumer behavior. However, there is a significant knowledge gap regarding the impact of the government-imposed single-use plastic bag use restrictions on consumer behavior, particularly in the context of varying levels of retailer involvement. Based on the gathered information, we suggest that the success or failure of plastic reduction legislation depends less on the specific policy instrument (ban or levy) or the severity of penalties but rather on the degree of retail sector involvement in policy development, implementation, and consumer outreach.

LITERATURE REVIEW

Factors Influencing Plastic Bag Consumption Habits

Many factors that people, businesses and services use to justify excessive plastic consumption and improper plastic disposal are similar across the globe. They include the convenience and practicability of using single-use plastic bags [4,27], habits [4], forgetfulness in bringing a reusable bag from home [3], lack of awareness and knowledge about plastic's negative effects on the environment [28], preference for single-

use over reusable bags [3], lack of available alternatives or lack of knowledge on how to utilize them [4,27], social norms [4], lack of willingness from the sellers to implement the legislation [5], price [3,27], lack of time and space for disposal [10] and lack of appropriate disposal and recycling infrastructure [4,5,27,28]. The combination of the above-listed reasons for unsustainable plastic bag consumption varies depending on the structure of the surveys or analyses done in each country. The same reasons can also be found in the selected case studies and will be elaborated further.

Many studies have been analyzing factors that serve as motivators or obstacles to sustainable consumer behavior. This research's theoretical framework was adapted from the literature review of Wintschnig [29], which concludes by theorizing that all factors can be divided into either those related to individuals or ones that are external. While not delving into all the aspects presented in Wintschnig's work, a similar dichotomous categorization can also be applied to evaluate the effectiveness of legislation on behavioral changes.

Individual-related factors

At a consumer level, behavioral choices are influenced by a complex interplay of factors, including the perceived costs (financial, accessibility, time, effort and distance) and benefits associated with consumption [30], as well as social influence and the perceived difficulty of the action [29].

Individual-related determinants influencing compliance with plastic bag reduction laws are multifaceted. They encompass socio-demographic factors, knowledge, habits, and personal traits and values [29].

Among socio-demographic factors are age, gender, education level, and income level, which have been identified as possible predeterminants for single-use plastic product consumption or the willingness to change unsustainable consumption habits. However, none of these factors are geographically or culturally predetermined and are generally inconclusive. Their impact can vary greatly, necessitating a tailored approach for each region where new policies are implemented to optimize communication strategies for businesses and consumers.

While knowledge and awareness of plastic waste and pollution are prerequisites to sustainable consumption, they are neither sufficient nor the strongest drivers of sustainable behavior [5,31,32]. There is also a difference between factual and action-related knowledge (i.e., practical implementation skills). While action-related knowledge is more likely to result in sustainable behavior [33], factual knowledge can paradoxically create tension and a sense of being trapped in unsustainable practices due to information overload and complexity [34]. Therefore, awareness of environmental issues does not automatically translate into pro-environmental behavior, creating an intention-action gap. This discrepancy highlights the difference between acknowledging the problem and taking steps to address it. A European study of ~7600

participants from eight countries found that, on the one hand, individuals' perception of personal responsibility and their self-assessed knowledge about plastics significantly influenced sustainable plastic consumption behaviors. On the other hand, concerns about plastic pollution and its consequences did not correlate with these behaviors [35]. Additionally, consumer awareness can go beyond environmental consciousness to recognize plastic's role in maintaining hygiene and extending product shelf life [32]. These factors should be considered when developing new information campaigns for new legislative actions.

Habits are among the strongest anchors for unsustainable behavior partially because of the time required to change old habits to new ones [36]. The current plastic waste problem's root stems from users' perception of plastic and its rapid transition from valuable objects to waste [10]. A perception gap contributes to excessive plastic packaging consumption. Consumers believe they experience a low direct impact [10] while overlooking the benefits to the environment and society from individual actions [11]. As regards improper waste disposal, it stems from historical practices when waste management systems were poorly developed or nonexistent. In particular, organic waste readily decomposed in warmer climates, establishing disposal norms. Consequently, policies aimed at modifying plastic consumption habits and waste disposal may go against deeply ingrained societal habits. Moreover, the emergence of a consumption-driven society has eroded traditional reuse practices [10].

Personality traits and values include a willingness to adapt, loyalty to personal beliefs, concern for others, self-discipline and egoistic values [29]. Personal beliefs form attitudes that consist of emotional and rational (costs and benefits) considerations. Consequently, attitudes lead to intentions that determine one's behavior [29]. Without a direct, personal experience of the negative consequences of plastic waste, consumers are less likely to adopt less convenient sustainable alternatives [10]. In addition, individuals with high egoistic values tend to maximize their benefits while minimizing costs, often resulting in less sustainable choices. These individuals engage in sustainable actions when considering the effort worthwhile [11]. In addition, materialistic values can undermine environmental concerns by negatively influencing environmental beliefs, which, in turn, can hinder pro-environmental behavior, influence subjective norms, and inhibit positive attitudes toward green products [37]. Hence, personal traits are difficult to change and necessitate carefully planned marketing strategies to achieve intended results. On the other hand, socially responsible consumers often exhibit high levels of self-efficacy and openness. Marketers can leverage these traits when developing advertisements to promote sustainable consumption [38].

External factors

External factors are environmental influences that shape consumer behavior towards sustainability, either positively or negatively. They can be divided into four main groups: structural conditions (public policy and infrastructure), product or service and behavior-related factors (costs, time, and stereotypes), corporate activities (information presentation and awareness raising), and social influence (social norms) [29]. While structural conditions are shaped solely by governments, the retail sector plays a multifaceted role in shaping sustainable consumption by influencing corporate practices, product or service and behavior-related factors and social norms.

Structural conditions comprise public policy, the development of proper waste collection and recycling infrastructure, and the development of different technological solutions based on the needs of today's lifestyle [29]. Overly ambitious yet poorly executed legislation, coupled with the undeveloped collection and recycling infrastructure and lack of availability and affordability of sustainable alternatives, can harm businesses, making them resist the changes and restrict consumer choices, creating a dependence on unsustainable consumption practices [29]. Therefore, while governments enact laws and place the responsibility for sustainable choices on consumers, a critical gap remains: the active involvement of the retail sector. Retailers play a pivotal role, connecting upstream entities—governments, plastic producers, and suppliers—with downstream consumers, thus shaping consumption habits [39]. Without retailers' commitment to offering and promoting sustainable alternatives, consumers have limited opportunities to make environmentally responsible choices.

Product, service and behavior-related factors are controlled both by the government and the retail sector. Within this category lie different costs, which can be monetary or time-related. Financial costs include the price of single-use plastic bags and their alternatives and, in the case of other SUPs, the refund amount in the deposit-return scheme. Making sustainable choices more affordable and imposing levies on conventional SUP products could induce more sustainable purchasing behavior, even for consumers who do not care about the environment [35]. While the price of plastic bags or their alternatives may not be an obstacle to sustainable choices per se, it may be one for consumers with less financial freedom [29]. Therefore, the role of price can greatly vary among countries with different economic or equity situations.

Time costs indicate the time and effort required to change habits and make more sustainable choices. Limited discretionary time can impede the formation of sustainable consumption habits, even among environmentally conscious individuals. Conversely, increased discretionary time helps translate sustainable intentions into actions [40]. A survey supports this, showing that consumers resistant to behavioral changes prefer reusing plastic packaging over adopting environmentally

friendly alternatives due to the immediate financial and time benefits of reuse [35].

Certain stereotypes and norms related to customer service and product performance can hinder the adoption of sustainable behaviors. For instance, the assumption that there will be fewer clients if purchased items are not placed in plastic bags [41]. Additionally, sustainable products are often perceived as less effective or strong while being more expensive than conventional products [29]. These perceptions can impede both public acceptance of plastic bag reduction laws and the shift toward sustainable behaviors. Therefore, communication strategies supporting plastic bag reduction legislation must address these misconceptions.

Plastic packaging recyclability is one of the most critical issues limiting sustainable consumption [6]. Therefore, at the governmental level, legislation should target improving the recyclability of the bags while actively encouraging consumers to use reusable packaging. While not directly related to plastic bag consumption, the government also needs to ensure the presence of proper waste management infrastructure to achieve and sustain substantial behavioral changes.

Social norms, which are the “unwritten rules” in every society, govern social behavior [42] and may not align with individual beliefs. The widespread use of single-use bags for fruits and vegetables, often perceived as more hygienic, is a prime example. Such behaviors are often regarded as part of normal behavior without ever being questioned [29].

Information presentation through message framing, communication strategies, and awareness raising are under the umbrella of corporate activities. While public awareness campaigns can effectively educate people about plastic’s harmful effects on human health and the environment and proper waste management, it is crucial to recognize that increased knowledge alone may not necessarily translate into sustainable behavior. Declarative messages involving the provision of information and the explanation of facts rarely lead to behavioral changes [6,43]. On the other hand, increasing awareness about the consequences and effectiveness of everyone’s individual behavior can stimulate environmentally positive behavior. For instance, explaining processes, such as waste sorting behaviors, can effectively trigger sustainable behavior [43]. Research shows that prevention-focused messages can be perceived as alarmist by highly egoistic people, deterring environmentally conscious behaviors. Conversely, promotional messaging (e.g., “thrive for a clean environment”) has demonstrated positive outcomes across all demographic groups without negative repercussions. These findings suggest that only promotion-focused messaging should be used for effective plastic packaging reduction campaign [11].

Role of the Retailers in Driving Sustainable Consumption

Retailers occupy a unique position, directly influenced by both governmental legislative choices and consumer decisions. As the central

link between different upstream and downstream actors [44], retailers can facilitate the implementation of the legislation aimed at reducing single-use bag consumption and can also influence law implementation processes. While governments initiate communication strategies to inform both businesses and consumers about impending plastic reduction measures, retailers must complement these efforts by actively participating in public education and awareness-raising to maximize the impact of the legislation.

In the absence of bag regulation policies, retailers often provide single-use plastic bags with every purchase, thus shaping customer behavior and preferences. Therefore, targeting retailers could be an effective way to change consumer bag usage patterns [39]. Due to their growing economic power and the trust retailers have built with customers, retailers bear increased responsibility to promote sustainability [45]. Retailers have evolved from mere product providers to influential consumer demand and behavior shapers. As 82% of the purchase decisions are made in-store [46], retailers hold a key position in sustainable initiatives [47]. Retailers' commitment to sustainable practices can foster pro-environmental behavior among consumers [37,45,48–50]. Due to their ability to introduce sustainable options into their value chains [47], retailers can serve as role models for consumers in shaping consumption habits.

Retailers can influence green consumer behavior through in-store marketing and other communication channels [47,51] by using message framing to establish and shape social norms and reinforce them through collective influence [52]. One example from a hotel study showed that a sign reading “the majority of guests reuse their towels” led to a higher reuse rate among guests compared to the traditional sign that emphasized only environmental protection [53]. Thus, consumers are more likely to adopt sustainable consumption practices if they believe their behavior is socially acceptable and aligns with the values of their social groups [38].

Using awareness-raising as the sole communication strategy is unlikely to result in behavioral changes in consumption habits [31]. Retailers can address the psychological aspect of consumer purchasing habit formation by altering the shopping context. One approach is to offer consumers incentives and rewards that encourage sustainable consumption practices [54], such as cashbacks, discounts, or goods. Public recognition of consumers for purchasing sustainable products and engaging in eco-friendly behaviors can also be beneficial. By promoting social acceptance, this approach can encourage both individual persistence and broader adoption of sustainable practices [55]. The incentives should be upheld over time to help consumers incorporate sustainable practices into their routines. Once consumers recognize the intrinsic benefits of sustainable consumption, retailers may gradually reduce these external rewards. Additionally, retailers can use positive affirmations to resonate with consumers' self-image regarding their commitment to sustainable consumption practices [55].

METHODOLOGY

A literature search in the PubMed and Scopus® databases was undertaken to identify relevant publications to identify why similar legislative strategies (bans or levies) yielded good long-term results in some cases while showing short-term or no effect in others. A meta-analysis was performed to understand how people perceived plastics, implemented legislative tools, and how much they were willing to change their consumption habits when facing new plastic pollution mitigation policies. Only articles analyzing legislative outcomes and related behavioral changes published from 2007 onwards were included in the search. This was done because Ireland was the first country to introduce a plastic bag levy for consumers in 2002, and 2007 was the first time a scientific analysis of the impact of this legislative strategy was published.

Articles with keywords “legislation”, “ban”, “taxes”, “levy”, and “policies” together with “plastic”, “single-use plastic”, “plastic bag”, “plastic carrier bag”, “behavior”, “perception”, “consumer” were used on the “TOPIC” basis during screening. This was not intended as an exhaustive study but rather as a representation of various factors that could affect plastic bag and SUP consumption habits. Additionally, different book chapters and intergovernmental and non-governmental pages were consulted to gather information about the plastic bag (and later—other SUP) bans and levies, as well as statistics on plastic consumption and plastic waste processing. Knowledge about recent reforms or the date of legislative outcomes was gathered from government-related as well as trustworthy online news sites such as (but not limited to) BBC News, The Himalayan Times (English language daily newspaper in Nepal), Deutsche Welle, and Packaging Insights (the global packaging news source). Several online news pages were consulted to access information about the newest policies if governmental documents were inaccessible. Most sources were in English; however, in the cases where the official translation of the governmental documents was not available, but the news reports referred to the original documents, governmental pages were translated to English using Google Translate, and the information was compared to the data available from the news web pages.

To narrow the research, 12 case studies from Europe, Africa, Oceania, Asia, and North America were selected from a fuller set due to their unique legislative features or nationally specific outcomes that optimize the analysis of outcomes and best practices. The criteria for selection were primarily based on the availability of scientific articles from the selected countries or regions, thereafter analyzing the effectiveness of the legislation while taking into consideration the heterogeneity of each country’s customs, political environment, and cultural heritage, thereby specifying the local conditions underlying its success or failure.

SUMMARY OF LEGISLATIVE INITIATIVES TO REDUCE PLASTIC BAG CONSUMPTION

Political interventions are considered effective in curbing plastic consumption [4]. From the waste hierarchy pyramid perspective, the most effective is the ban on single-use bags and penalties for noncompliance that prevent waste creation. For the ban on plastic bag manufacturing, sale, and use, the stringency varies among the countries, ranging from partial bans with weak monitoring or enforcement systems (India, Nepal, Botswana) to total bans with severe punishments for disobedience (Rwanda). An alternative approach is the upstream tax for businesses (manufacturers, importers, and sellers) or the application of different levies for plastic bags at the point of sale. The latter is the most widespread policy instrument deployed for changing plastic bag consumption behavior. The rationale behind setting a price for bags that were previously free of charge is the comparison of costs and benefits that will motivate people to change consumption habits [4].

The most significant forcing factor for decreasing plastic carrier bag and other SUP consumption and their associated waste came from the Chinese waste import ban in 2017 [56]. It forced many countries, including EU member states, to review their plastic consumption habits and plastic waste disposal strategies, resulting in the EU's restrictions on certain SUP consumption since July 2021 [57] and the requirements to increase the recycling percentage of packaging containing plastic [58]. However, Directive (EU) 2019/904 did not state by which date the supply of SUP bought before July 2021 ought to be consumed, thus creating a loophole in the system and allowing the possibility of smuggling SUP from countries with less strict legislative framework under the pretext of using the SUP stock bought during the pre-ban period.

Many countries have tried to or have implemented plastic bag/other SUP levies or bans. Legislative examples from the 12 countries regarding plastic bag reduction policies are herein appraised chronologically to showcase the reasons for their success or failure and the timeline of their implementation, development and outcome (Table 1).

Table 1. Summary of different legislations and their outcomes across 12 countries by year of first legislative action.

Country	Year	Ban	Levy	Tax or fine		Enforcement mechanism	Reported outcome	Source
				for consumers	for retailers			
Nepal	1995	All plastic bags	-	-	-	-	No effect within 2 years	[59]
	2011	Bags < 20 µm	-	Fine: EUR 1.77 (NPR 255)	-	-	-	[60]
				Fine reduced to EUR 1.15 (NPR 166) one year later	-	-	14% choose reusable bags	[7,59]
	2015	Import, storage sales for bags < 40 µm	-	-	-	-	Implementation dropped after the Gorkha earthquake	[59,60]
	2021	Production, distribution and use of bags < 40 µm	-	-	-	-	Implementation hindered by COVID-19	[61]
	2022	Import ban for bags < 40 µm	-	Fine: EUR 2085 (NPR 300,000)	-	Setup of a monitoring committee	-	[62]
2023	Bags < 40 µm and plastic flowers	-	-	-	-	-	[63]	
Ireland	2002	-	Plastic bags	EUR 0.15 per bag	-	-	-	[64]
	2007	-	-	Increase to EUR 0.22	-	-	95% reduction in bag use after 12 years	[65,66]
South Africa	2003	Bags < 24 µm	Bags > 24 µm	Levy: EUR 0.02 (ZAR 0.46)	-	-	Initially 58% decline in the use of bags	[67,68]
				3 months later decrease to EUR 0.01 (ZAR 0.17)	-	-	Increase in bag use	
	2022	-	-	Increase to ZAR 0.28 (EUR 0.01)	-	-	-	[69]
	2024	-	-	Increase to ZAR 0.32 (EUR 0.02)	-	-	-	[70]

Table 1. Cont.

Country	Year	Ban	Levy	Tax or fine		Enforcement mechanism	Reported outcome	Source
				for consumers	for retailers			
Botswana	2007	Bags < 24 µm	Bags > 24 µm	EUR 345 (BWP 5000) fine and up to 3 years of prison	-	-	Within 18 months, 50% decrease in bag use;	[71]
				Price per bag set by retailers: EUR 0.01–0.02 (BWP 0.2 to BWP 0.35)			10 years later, almost 58% buy new bags with every purchase; no fee collection system by the government	[72]
	2018	Bags < 30 µm	-	EUR 345 fine or max 30 days of prison	-	-	2 weeks later, the law was postponed indefinitely	[73]
	2021	-	Bags < 30 µm	EUR 0.01 (BWP 0.15) levy; EUR 14 (BWP 200) fine or max 6 months of prison	-	-	-	[74]
China	2007	Bags < 25 µm	Bags > 25 µm	Fine for noncompliance EUR 658 and EUR 2630 (RMB 5000–20,000)	-	-	Reduction in bag use by 49%. Only 17.5% of consumers bring bags from home	[75,76]
	2020	Update: to stop using plastic bags and straws by the end of 2020		-	-	-	Decrease in regulated bag use by 44%. Increase in ultra-light plastic bag use. Over 90% of consumers do not reuse old plastic bags	[77,78]
	2021	Update: Request to sell only reusable bags		Fine: EUR 1312	Fine: EUR 13116 (RMB 10,000–100,000)	-	In 2021 decrease in regulated bag use by 46%; increase in old plastic bag use by 117% and reusable bags—by 36%	[79]

Table 1. Cont.

Country	Year	Ban	Levy	Tax or fine		Enforcement mechanism	Reported outcome	Source
				for consumers	for retailers			
Rwanda	2008	All plastic bags	-	EUR 408 (FRW 500,000) fine and max 1 year of prison;	-	Monitoring using militia	-	[41,80]
	2019	SUP	-	Fine: EUR 41 (FRW 50,000)	Fine: EUR 1500 (FRW 10,000,000) for manufacturers, EUR 245 (FRW 300,000) for retailers. Up to 1 year of prison for manufacturers if use plastic for transportation of goods.		Official data: no plastic bags in the country; increased income from eco-tourism Negative side effect: smuggling and illicit plastic bag use	[81,82]
India	2009	All plastic bags	-	-	-	-	1 year later, no effect (6% decrease)	[83]
	2021	17 types of SUP from 2022	-	-	-	-	No uniform and effective implementation strategy	[84,85]
	2022	SUP	Extended Producer Responsibility for plastic packaging	-	-	-	Ineffective because no enforcement mechanism	[86–89]

Table 1. Cont.

Country	Year	Ban	Levy	Tax or fine		Enforcement mechanism	Reported outcome	Source
				for consumers	for retailers			
Canada	2009	-	Plastic bags	0.03 (CAD 0.05)	-	-	72% use reusable bags more often; 59% use fewer plastic bags	[90,91]
	2019	All plastic bags	-	-	-	-	Use rate of reusable bags increase by 3.4%	[90,92]
	2022	Manufacture and import; sales by the end of 2023	-	-	-	-	97% use reusable bags in 2021	[93]
Zimbabwe	2010	Bags < 30 μm (except for bread bags and clingy films)	Bags > 30 μm	Levy: EUR 0.05 (ZAR 1) Fine: EUR 4542 or one year in prison	-	-	Initial decrease, but 3 years after the tax, consumption of bags increases Illegal dumpsite formation	[41,94]
	2021	All plastic bags by the end of 2022	-	-	-	-	Implementation postponed indefinitely	[95]
Australia	2011	Bags < 35 μm	-	-	Fine: EUR 3333 (AUD 5500)	-	7 years later reduction in single-use bag use but no reduction in total plastic bag use 90% reduction compared to 2016	[96–98]
Portugal	2015	Bags < 50 μm	Bags > 50 μm	EUR 0.10	-	-	Four months later 74% decrease in single-use plastic bag use. 12% increase in garbage bag consumption. 99% drop after 3 years Positive spillover—better waste recycling	[99–101]
	2024	-	Ultra-light bags (for fruits and vegetables)	EUR 0.04	-	-	-	[102]

Table 1. Cont.

Country	Year	Ban	Levy	Tax or fine for consumers	for retailers	Enforcement mechanism	Reported outcome	Source
Greece	2018	-	Bags between 15 and 50 μ m	EUR 0.04	-	-	80.3% drop after 1 year	[103]
	2019	-	-	Increase to EUR 0.09	-	-	98.6% drop in use compared to 2017 (3 years) High bag reuse rate 40% increase in garbage bag use compared to 2017 99.9% drop in use in 2020	[104–107]

FINDINGS ON THE IMPACT OF THE LEGISLATION ON PLASTIC BAG CONSUMPTION HABITS

After implementing new legislation, many countries saw an initial drop in the plastic bag use rate, thus showing positive short-term effects. Unfortunately, in many cases where follow-up studies were done, it became clear that plastic bag consumption levels gradually increased, in some cases returning to pre-legislation levels. Nevertheless, several countries succeeded in implementing long-term changes in consumption habits. Based on the available information about the long-term outcomes of the adopted policies presented in Table 1, the effectiveness of legislation was compared in Figure 1. Since all the studies were done at different time points, the term ‘long-term’ is applied to all the reported results varying between one to 12 years after implementing the policies. The left side of the graph assembles the countries that implemented a blanket ban on single-use plastic bags, while the right side shows countries with a ban on thinner bags and a levy on thicker bags or a levy alone. While countries stained in black indicate the stated percentage of bag use, the grey color for Rwanda is an assumed value based on the reported information that the country succeeded in almost entirely eradicating plastic bag use [82] a result similar to Australia [98] but, due to the illegal smuggling of bags, has not attained higher scores. As for Zimbabwe, no statistical data could be found apart from the information that after the first unsuccessful attempt to implement the legislation, the new law was postponed indefinitely.

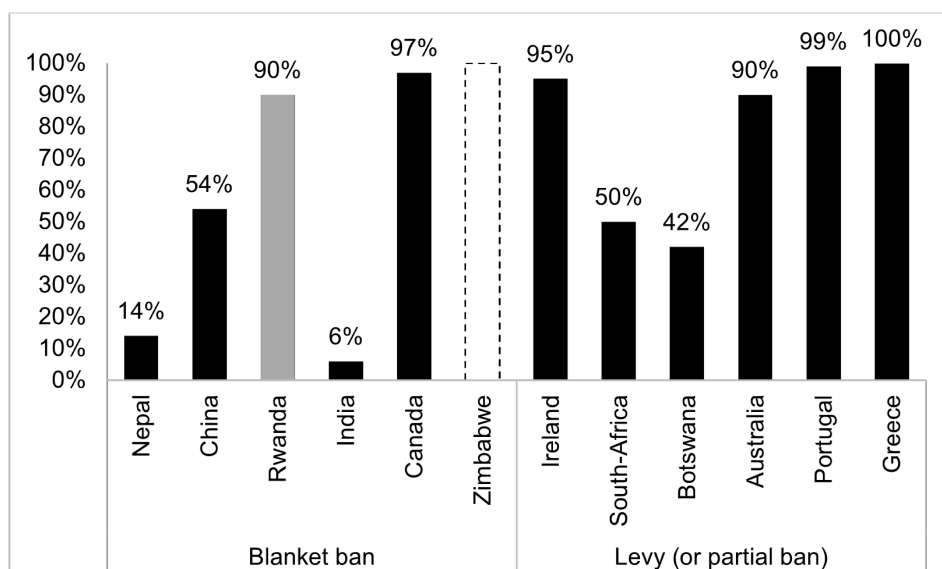


Figure 1. Long-term effectiveness of the single-use bag reduction legislation. Values indicate the drop in single-use plastic bag use compared to the pre-legislation levels. Black represents published data; grey indicates assumed value; white indicates no data available because the law was postponed indefinitely.

As Figure 1 demonstrates, the type of legislation alone is not the explanatory variable in the success or failure of the legislative outcome. The following sections explain how other factors have affected the legislative outcome.

The following sections delve into the complexities of crafting and executing effective plastics reduction legislation. It explores the interplay of incentives and levies, enforcement, consumer and retailer behavior, and industry responses. At the outset, the obvious must be stated: there is no “one size fits all” solution; in this article, however, we aim to demonstrate a smorgasbord of various best practices that may possibly be successfully adapted for local conditions. At the very least, we show how and why some approaches failed, which affords lessons learned for policymakers debating SUP legislation.

Individual-Related Factors

While this study focused on the influence of external factors, particularly the role of the retail sector on legislative outcomes, successful policy implementation also requires considering the human element. From the consumer perspective, promoting behavioral changes and sustainable consumption requires fostering a sense of agency.

Despite the potential influence of socio-demographic factors on legislative outcomes, these variables were excluded due to their heterogeneity, inconsistent findings in the literature, and insufficient data within the selected case studies.

Knowledge

There is a discrepancy between people’s attitudes towards plastic bags and the sustainable actions people are willing to take to make sustainable choices. In Nepal, the survey revealed that while customers were aware of the restrictions on plastic bag use, they considered it a problem that the retailers have to deal with, thus relying on the institutions to take care of the issue [39]. In Australia, customers expected that with the ban on plastic bags, retail stores would cover the expenses of reusable bags in exchange for customer loyalty [108]. In Botswana, the reasons why consumers continued using plastic bags were their availability and habits, even though the respondents knew about the levy and its purposes [72].

Habits

From the case studies analyzed, the intention-action gap is apparent in several countries. While most respondents theoretically supported the policy in China, they opted not to cease using bags solely out of convenience [75]. Similarly, in Nepal, where 84% of the respondents favored the plastic bag ban, only 14% used reusable bags [7], thus underscoring the non-conformity between a stated willingness to act and the action eventually taken. Similar findings came from South Africa, where the primary reason for buying new single-use bags with every shopping trip was the inconvenience of carrying plastic bags from home [67]. In surveys carried out in China, 40% of people indicated that they would bring their bags to grocery stores. However, only 17.5% of people

actually did so [109]. This indicates that in answering surveys, respondents may feel pressure to provide expected responses, thereby inflating their environmentally responsible behavior [29]. Additionally, individuals may desire to present themselves as more environmentally conscious than they truly are.

Personality traits and values

As research has shown, the intention-action gap can be bridged by building a person's perceived self-efficacy and creating a belief in one's ability to accomplish a certain task even when facing obstacles [110]. Therefore, people's belief that their actions can make a difference and have a positive impact can motivate them to take steps towards sustainable behavior, especially that of carrying a reusable bag. Consumers need to believe they can make a difference through their choices and that their actions positively impact something they value, such as the environment or health.

When analyzing people's behavior, it has been shown that if people voluntarily stop using single-use plastic bags and start bringing their own bags, a positive spillover effect can ensue, stimulating them to adopt other waste-conscious decisions [111]. On the other hand, when behavioral changes are imposed by law, the results may not be long-lasting [111]. This is the case in Australia, where beach clean-up day has become a nationwide event. While people feel empowered by the beach clean-ups and the possibility to choose the place they clean, they do not like being told what to do [112]. Therefore, in Australia, a 'green gap' has been reported, describing a situation where both consumers and retailers support sustainable activities but resist prescribed interventions [113]. This suggests that efforts should be put into identifying optimal self-efficacy-oriented behaviors before advocating for a new law [11,114].

In some instances, consumers who adopted the policy and made behavioral changes mainly did so for environmental reasons. Those who opposed the charge used their own bags only for cost savings [115]. Greece's model departs from this utilitarian concern, as the main reason for the increased reuse rate or the cessation of the use of plastic bags was the environmental impact [116], results that have been achieved through successful awareness-raising campaigns led by the retail sector.

External Factors

Governmental role and structural conditions

Through legislative measures, several factors should be considered to create durable changes in consumption habits. First is the type of legislation (ban, partial ban or levy) to be promulgated since they all have different advantages and weak points to consider.

For legislation involving a punitive approach to be effective, such as a complete ban, clearly defined mechanisms for monitoring compliance and

clearly defined and enforced punishments for non-compliance should be set. Such bans should be understood to be long-term initiatives rather than instantaneous measures and should be combined with incentives for recycling. In Rwanda, compliance with the plastic bag and other SUP ban was achieved through high fines, imprisonment risk, and militia deployment to monitor compliance [41,81,94], thus earning Rwanda the status of one of the cleanest countries in Africa. Additional considerations should be whether an increase in fines for non-compliance or, in the case of levies, an increase in cost, are justified after some time has elapsed. A successful example is Ireland, which not only set a levy more than six times higher than consumers' willingness to pay for plastic bags but also increased it by 47% after five years [65], resulting in a 95% drop in single-use plastic bag use (Figure 1). Conversely, in Nepal, the government did not elaborate on any enforcement mechanisms or compliance procedures, and the frequency of compliance monitoring decreased gradually, ceasing after one year [59]. The same pattern as in Nepal is also reported in India, where weak enforcement of the law and weak penalties resulted in the decaying effect of the ban. India lacked clear and credible information about the penalties for retailers and customers. Within a year, the use of a plastic carrier bag per shopping trip returned to the same consumption rate as in cities with no ban [83].

The perception of sanctions was estimated to be the critical determinant of plastic bag use. Results from a survey in Nepal indicate that doubling the perceived sanction could reduce the use of plastic bags by half for consumers and by two-thirds for retailers [60]. Therefore, it was concluded that for the plastic ban to be effective, one year after its implementation (which coincided with the time when the ban became ineffective), the expected fine for bag use should be increased by about four times since the subjective probability of being caught is strongly associated with reduced use of plastic bags [59]. The same strategy can also be applied to retailers since they significantly reduced the dispensing of bags with an increase in expected fine [39]. Since plastic bag use is a low-cost behavior, the effect of increasing the subjective probability of being caught is more efficient than the actual increase in charges [59].

The ban should be applied to all stages of manufacturing, import distribution, and bag use. If the implementation of the ban is mainly concentrated at the consumer level, as was done in China [117], there is no effective control at the source, which weakens the outcome.

Another important aspect is to ensure a unified strategy and implementation across all retailers nationwide. In Nepal, the fine amount confusingly varied among municipalities [10], with some prohibiting all single-use plastic bags while others did not regulate their use [60]. A similar issue was reported in India [118]. In Botswana, on the other hand, while the violation of the law could be punished with a high fine or up to 3 years in prison, the law failed to stipulate how high the charge per bag should be. Therefore, bag prices were set by retailers and varied greatly

[71]. Within 18 months, overall plastic bag use decreased by 50%, during which the price per bag increased by 31%, with the steepest increase in high-income retail stores. Consequently, the levy resulted in a significant reduction in plastic bag use from high-income and lowest income retailers but did not affect the middle-income class [71]. In addition, the government failed to set up a fee collection system from the retailers and to invest the profits into environmental protection. Therefore, the income from the unclaimed levy became subsumed in retailers' profits [119].

Another factor to consider is the rapidly evolving e-commerce, food delivery, and takeaway services. How these uncontrolled services will provide their goods and how they can be monitored must be well thought through. In Asia and Africa, there are many street vendors, small shops and convenience stores, which are difficult both to monitor and to enforce compliance with the law without offering viable replacement options, thus explaining the less-than-desired outcomes of their legislation (Figure 1).

Another issue reported by the countries that failed to achieve successful outcomes was that only certain types of bags were banned, most often excluding ultra-light plastic bags (less than 15 μm). In several countries, this created a situation where the regulated bag consumption decreased while the overall plastic bag consumption increased. In China, for example, several ultra-light bags were being placed inside each other to be used as a substitute for regular single-use bags, and their consumption, therefore, increased significantly [78]. Similarly, in Europe, after applying the plastic bag directive [120] that aimed at reducing the consumption of lightweight plastic bags, their consumption decreased between 2018 (22.0 bn) and 2019 (19.8 bn), stabilizing at that level in 2020 (19.9 bn). However, the consumption of ultra-light plastic bags steadily increased from 14.0 bn in 2018 to 14.3 bn in 2019 and 14.7 bn in 2020 [121]. This increase, similar to the results from China, clarifies the substitution effect for less-available light plastic carrier bags. In Portugal and Greece, the implementation of the levy on certain types of bags increased the purchase and the consumption of garbage bag use [99,106]. In Australia, during the first ban, while the consumption of single-use plastic carrier bags decreased, the consumption of other types of plastic bags increased [97]. Therefore, when not banning or taxing all plastic bags, the legislation might appear effective in solving one problem but fails to change overall plastic bag consumption habits. To avoid a situation where lightweight plastic bags are replaced by excessive use of ultra-light free-of-charge bags or stimulate the sale of garbage bags, one solution would be to apply the levy to all plastic bags [78]. This would preempt consumers from replacing one type with another plastic alternative, thus not altering overall consumption patterns [122].

Therefore, it is plausible that the absence of adapted alternatives, together with the lack of exemptions for wet produce sellers (dairy and meat), were the reasons why Nepalese retailers refused to comply with the legislation [39]. In China, when its legislation was updated, the

requirement was to sell only reusable bags [79]. This resulted in a massive production of non-woven bags, which, while more expensive than single-use bags, were not of adequate quality and, therefore, could not be reused enough times to offset the greater amount of resources needed for their production [123].

In the case of imposed legislation, the upstream suppliers may not always be willing to comply with the law [124]. A case study of a plastic manufacturer in India revealed that policymakers often face pressure from powerful private sector interests, hindering the implementation of strict regulations. The challenge lies not only in envisioning a sustainable future but also in developing effective policies to support sustainable consumption and production initiatives [54]. Therefore, policymakers should consider not only the presence or absence of infrastructure and the possibility of adapting it to conform with new legislative requirements but also treat retailers and manufacturers as essential stakeholders and create a compensation mechanism to subsidize fiscal losses deriving from the legislated changes. A government should also consider the needs and habits of consumers when considering how to amend them via gratification mechanisms, such as deposit-return schemes. Lastly, since municipalities find it easier to enforce plastic bans through retailers due to their fixed locations and regulated operations [39], the government should install proper monitoring and enforcement systems to ensure compliance with the implemented laws.

Product, service and behavior-related factors

One important element to consider when implementing a levy for consumers or setting up a ban or a tax for manufacturers and retailers is the cost. In several countries, the difficulty in finding the “right” price for the bags, which was often set too low, was mentioned as one of the reasons for the lack of persistent changes in plastic bag consumption habits. The policy usually lost effectiveness once consumers became accustomed to paying for the bags [105]. This phenomenon was reported in several countries, including Zimbabwe [41], South Africa [67,68], and Nepal [59]. In South Africa, the price per bag decreased in the face of the bag manufacturer lobby [124]. While the levy gradually increased, it never reached the initial price, thus giving people enough time to get accustomed to the price increase [71]. In Zimbabwe, the levy was too low to make people change their habits [41]. In 2022, India introduced the law for a SUP ban in addition to the plastic bag ban [125], together with Extended Producer Responsibility for plastic packaging [86,87]. One of the reasons why the law proved ineffective was the inconsequential price difference between single-use polyethylene bags and cloth or paper alternatives [89]. Interestingly, Australia faced a different but related problem a week after the single-use plastic bag ban came into force. The price was set for reusable bags, but customers refused to pay for these, thus forcing retail stores to provide reusable bags for free [126]. In Ireland, among the

reasons why the new tax set an example for the rest of the world was that the levy was more than six times higher than consumers' willingness to pay for plastic bags [127].

The prices should also be aligned with other plastic bags used for different purposes. For example, since the shopping bags before the tax were reused as garbage bin linings, the levy increased the consumption of garbage bags in Portugal [99] and in Greece [106] by 12% and 40%, respectively. It is worth noting that since the fees change consumers' preference for a product through a price increase rather than through information about the potential hazards, imposing a levy or fines without a proper information campaign may not lead to permanent behavioral changes [128]. In addition, fees may also impact other sustainable behavior habits like waste recycling. For example, in Portugal, while 47% of respondents reported a positive spill-over for waste recycling, 37% reported a worsening of their recycling habits [101]. This strongly suggests that a proper study of the local mindset and consumption habits in the country of interest should be done before designing and implementing an environmental tax.

One important factor that can decrease the positive outcomes of the legislation is the rapidity of full implementation. Governments must consider how long it will take for businesses and customers to adapt to the new changes. For example, in Zimbabwe, after the implementation of the ban, the retailers were given only a 6 month grace period despite a plastic bag stock that could last for 4–5 years [41].

One of the most important elements in policy making is the robust communication with stakeholders during the proposed legislation's design period. In India, among the reasons why the ban failed was political resistance [129]. South-Africa, which has tried to implement a partial ban several times, reached an initial 58% drop in bag use, which later increased [67,68], but resorted to only a top-down approach without consulting affected stakeholders. Since there was a strong lobbying effort by manufacturers, a decrease in the levy ensued, reducing positive impacts [130]. Similarly, while Botswana did consult with its civil society, the strong influence of manufacturers affected the policy, thus making it only partially effective (a 42% drop). In February 2023, the parliament announced that Botswana Unified Revenue Service would start collecting plastic levies on behalf of the government to be obtained from importing, manufacturing, and distributing plastic carrier bags. At the same time, the parliament announced that while the government would support plastic value chain development, there would be no bans on single-use plastics [131]. Interestingly, while Rwanda also applied a top-down approach, it resulted in an effective ban. This was because Rwanda aimed to gain international recognition as an environmental leader to attract more tourism. Attention has been focused on the service economy rather than supporting the manufacturing or recycling industries, neither of which

received any subsidies, resulting in the import of paper bags from the neighboring countries [82].

Ireland opted for a different approach. The crucial factor for the Irish success (a 95% drop) was the extensive consultations undertaken with different stakeholders and the public before the implementation of the levy, thus encouraging general support [127]. Canada chose another path. After the initial blanket ban failed to result in high bag reuse rates [90], when designing its new policy, the government released a science assessment of plastic pollution that recommended the reduction in the use of plastics following precautionary principles [132].

To increase the success of the legislation, there should also be an increase in the offer of alternatives to single-use plastic bags targeting both retailers and consumers, predicated on the varied packaging needs of different product categories (dry or wet). Additionally, for retailers to accept changes and consumers to maintain sustainable behavior, sustainable alternatives must also deliver in terms of performance [76]. At the same time, they must be affordable because even for consumers who value sustainability, other factors, such as price, may take priority [8].

Retail Sector's Role as a Gatekeeper for a Successful Legislative Outcome

Retailers and other sales-oriented businesses hold a unique position, bridging the gap between government regulations and consumer behavior. They, therefore, play a crucial role in the outcome of the legislation by transforming government plans from ideas into reality. However, retailers also face a complex challenge in encouraging upstream suppliers to adopt sustainable practices, comply with regulations, and offer consumers choices that align with their preferences—all while maintaining profitability. Due to their unique position, retailers can incentivize sustainable practices by implementing standards, norms, and guidelines [44]. This strategy is more feasible in Western countries, where large, centralized retail chains dominate. However, in the Asian and African context, where family-owned retail businesses are prevalent, implementing such direct regulatory measures may prove challenging. Therefore, the importance of retail sector involvement in pre-implementation discussions and public awareness raising cannot be neglected. Due to complicated monitoring systems for compliance and often limited resources, governments must collaborate with and involve retailers in enforcement activities. To pre-empt circumvention, the effectiveness of the legislation hinges on the involvement and support of the retail sector [39].

In Botswana, where retailers set the prices for bags, offers a cautionary tale. The price range and the yearly increment were uncontrolled by the government, and the fees became profit for the retailers [71]. 10 years later, almost 58% of the consumers bought a new plastic bag with every purchase (Figure 1) [72].

Since retail stores are private businesses that assess the costs and benefits of the decisions reached by governments, they respond according to their business interests and the goods sold. In places like wet markets or farmers' markets, the alternatives to plastic bags are costlier than paper alternatives and are often scarcely available in developing countries [54,55]. Thus, since the governmental choice of banning single-use bags may threaten their livelihoods, retailers are likely to express more resistance and shun compliance [39]. For example, in India and Nepal, where the retail sector primarily consists of small, family-run businesses, municipalities struggled to monitor compliance with the law across the sector. Unsurprisingly, both countries showed close to no effect of their legislation (Figure 1). This points to the reality that if the government cannot ensure alternatives to single-use plastic bags, there ought to be a waiver for retailers who sell wet goods.

In China, while the government required all supermarkets to stop using non-biodegradable single-use bags, traditional open markets were excluded from this ban [77]. Unexpectedly, due to the popularity of these markets and the lack of control in the supermarkets, the ban increased the total use of single-use plastic bags because of the overconsumption of ultra-thin plastic bags that were exempt from the charge and were used as replacement bags [78]. On the other hand, in Canada, alternatives to single-use bags have become commonplace, and some large retailers had eliminated single-use bags prior to the new regulation that came into effect in 2022 [133].

Social influence

Bag smuggling is related not only to the retail challenges in adapting to new regulations but also to the desire to maintain customer service expectations. Often, the bags are offered for free of charge or as incentives to attract customers [82]. They are considered a part of customer service, and traders in Zimbabwe and India feared that the absence of bags would decrease the number of customers and would, therefore, scale down their livelihoods [41,134]. In China, none of the vegetable markets or shops that provided delivery services stopped providing plastic bags despite the plastic bag ban [75,78]. Interestingly, the fear of losing customers if not provided with bags was also reported in economically more developed countries such as Australia [108]. This indicates a universal problem of customer reliance on single-use bags. At the customer level, normalizing bag use with each purchase can be overcome with a complete ban on single-use plastic bags or through a competent communication campaign where the need for change is well explained, as it was carried out in Canada [132]. Therefore, establishing reusable bags as the social norm is crucial for achieving long-term sustainability.

Information presentation

To increase the reach of the information and the effectiveness of the legislation, retailers should take an active part in awareness-raising campaigns. A good example is that of Portugal, where supermarkets that offered free single-use plastic bags promoted wasteful behavior because the customers filled the bags only by half and took more bags than necessary [116]. Once Portuguese supermarkets started providing reusable plastic bag alternatives, it helped to re-educate society to decrease single-use bag consumption [99]. Now, Portugal has reached a 99% long-term decrease in the single-use bag use (Figure 1). On the other hand, the ban was resisted in Zimbabwe because there was little awareness-raising publicity about why the ban was being initiated. Lightweight plastic bags started to be smuggled from Mozambique and were freely available in the fruit and vegetable markets despite the plastic bag ban [41]. Interestingly, even Rwanda, with its strict ban policy, has seen plastic bag smuggling from the surrounding countries arranged by retail businesses [82]. Greece showed an impressive reduction of 99.9% in single-use bag consumption, which owes its success to several factors, among which is the well-considered campaign that targeted both self-centered consumers and the moral actors in society. The supermarkets, to avoid the negative reaction of society to the increase of the levy, joined with non-profit organizations and created an education strategy that would explain the single-use plastic problem, the legislation and the alternatives to single-use plastic bags [116]. Hence, in addition to consulting different stakeholders when developing new legislation, it is of utmost importance to establish a relevant and targeted communication strategy such as those implemented in Ireland [127] and Greece [116].

Trust in government plays a role in the outcome of the legislation. In Portugal, while most respondents agreed with the tax, it was perceived as another way to increase the State's revenues because it was unclear that the tax revenues would be used for environmental protection purposes. Hence, the implemented tax did not change the perception of plastic's environmental and health impact [99]. In Nepal [60] where the law's implementation failed, there was no explanation of the purpose and necessity of the legislation. Similarly, in Zimbabwe, where within three years after the implementation of the tax, plastic bag consumption returned to the pre-ban levels, there was generally no understanding of why the ban was introduced in the first place [41]. In South Africa, one of the causes of the failure was the lack of awareness-raising campaigns about plastic pollution [122]. In addition, the law did not specify which type of bags would be banned, and no alternatives to plastic bags were discussed, resulting in further confusion and lack of adherence to legislation [68].

A survey was conducted to understand why people in Portugal switched from single-use to reusable bags. While saving money was initially the primary motivation, post-levy implementation, more

respondents chose “it’s better for the environment”. This suggests that awareness campaigns effectively communicated the purpose of the tax and the environmental impact of plastic bags [99].

A different approach was implemented in Canada, where the government categorized plastics as a toxic substance, an unambiguously clear message based on the scientific report on plastic pollution [135] resulting in a 97% bag reuse rate (Figure 1) and high support levels among both retailers and consumers.

One of the best examples of a communication strategy is that of Greece. The informative campaign by supermarkets was so effective that it saw a positive spill-over effect among other retail outlets that used the information provided by the supermarkets, thus spreading awareness even further and helping to curb plastic bag consumption [116]. The brilliance of their communication strategy was in the fact that it targeted not only selfish people who are driven by taxes or monetary incentives but also moral actors. The strategy deployed presented an opportunity for an individual consumer to appear to others as more environmentally conscious and, thus, ‘better’ in the eyes of society. Importantly, the campaign was run using a non-profit, trustworthy environmental organization, thus decreasing the skepticism of consumers who might otherwise presume the retail industry is acting in its self-interest to gain profit out of the environmental tax [116].

In Botswana, where the legislation was ineffective, almost 60% of respondents indicated their use of plastic bags with every shopping trip. They also stated that they were informed about the levy by the retailers and not the government [72].

In Ireland, a strong publicity campaign was launched before the levy implementation, informing consumers that all revenues would be directed solely to support various environmental programs, thus removing any speculation that retailers would gain extra profit from the bag sales. The most important success factor highlighted in the study was that of the extensive consultations with different stakeholders and the public before implementing the levy, thus guaranteeing general support [127]. After the consultations, retailers should design their informative campaigns as a reflection of individual values and self-worth, encouraging consumers to make sustainable choices [55].

CONCLUSIONS

The analysis of twelve case studies revealed a diverse range of factors influencing plastic consumption or pro-environmental behaviors, as well as a variety of outcomes resulting from the implemented legislation. To develop effective policies, policymakers must consider multiple variables, including extensive stakeholder engagement during policy formulation, financial incentives for businesses, accessible and affordable alternatives for consumers and retailers, and public perception of environmental issues. Most importantly, governments should take into account the role

of the retail sector as it holds a unique position in influencing the outcomes of legislation due to its strong presence in the media, associated consumer trust, and the presence in consumers' daily lives.

While numerous factors influence the efficacy of plastic bag reduction legislation, the retail landscape presents distinct challenges in certain regions. Unlike the dominance of supermarket chains in Europe, Canada, and Australia, African and Asian countries are characterised by a prevalence of small, family-owned businesses. This retail structure complicates enforcement and public engagement efforts related to plastic reduction policies. To address these challenges, governments should provide targeted support to retailers during the transition period, fostering cooperation and ensuring both compliance and effective monitoring of the implementation of the law.

The successful implementation of plastic bag reduction policies in Greece, Ireland, Portugal, and Canada underscores the importance of comprehensive stakeholder engagement. By effectively communicating the rationale of the legislation, governments can garner widespread support. Retailers, as intermediaries between government and consumers, play a crucial role in disseminating information about plastic pollution, policy details, and available alternatives. Their active participation can significantly amplify the effectiveness of public awareness campaigns. Prior to implementing any informative campaigns, it is imperative to field a comprehensive assessment of the retail sector, including consumption patterns, consumer preferences, and the determinants of sustainable or unsustainable behaviors within specific regions. Retailers can play a pivotal role in providing this information. Additionally, a rigorous cost-benefit analysis should inform the selection of optimal plastic packaging alternatives. Intervention strategies must adopt a multifaceted approach, targeting both socio-demographic and socio-psychological factors. By leveraging these insights, targeted interventions can be designed. Throughout the case studies examined, retailers proved to be key players—either as effective channels for disseminating information and influencing behavior towards more sustainable consumption or as barriers preventing successful policy outcomes.

DATA AVAILABILITY

All data gathered from the study are available in the manuscript.

AUTHOR CONTRIBUTIONS

Conceptualization, UM and JG; Methodology, UM; Data Curation, UM; Writing—Original Draft Preparation, UM; Writing—Review & Editing, UM and LM; Supervision, LA; Project Administration, LA; Funding Acquisition, LA.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

FUNDING

This research was funded by the Latvian State Institute of Wood Chemistry Bio-economic grant “HardBone” 2024, No. 05-24.

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How to cite this article:

Milbreta U, Milich L, Andze L, Gusca J. Some Countries Can Say “No!” to Single-Use Plastics, Others Cannot: Why Do Seemingly Similar Policies Have Different Outcomes? *J Sustain Res.* 2025;7(1):e250004. <https://doi.org/10.20900/jsr20250004>