

# Legal and public policy overview related to the disposal of cigarette butts

*Panorama jurídico e de políticas públicas relacionadas ao descarte das pontas de cigarro*

GABRIELA AZEVEDO DE SOUZA<sup>1,\*</sup> 

<sup>1</sup> Universidade do Estado de Santa Catarina (UDESC) (Lages, SC, Brasil)

gabriela.azs@hotmail.com

JULIANA FERREIRA SOARES<sup>1,\*\*</sup> 

<sup>1</sup> Universidade do Estado de Santa Catarina (UDESC) (Lages, SC, Brasil)

juliana.soares@udesc.br

FLÁVIO JOSÉ SIMIONI<sup>1,\*\*\*</sup> 

<sup>1</sup> Universidade do Estado de Santa Catarina (UDESC) (Lages, SC, Brasil)

flavio.simioni@udesc.br

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\* Mestranda no Programa de Pós-Graduação em Ciências Ambientais (PPGCAMB), da Universidade do Estado de Santa Catarina - UDESC (Lages, Brasil). Especialista em Perícia e Auditoria Ambiental pelo Centro de Ensino Superior de Maringá (CESUMAR) e Engenheira Sanitarista pela Universidade do Estado de Santa Catarina (UDESC). É Engenheira Sanitarista com registro profissional ativo no Conselho Regional de Engenharia e Agronomia de Santa Catarina (CREA/SC) e atualmente participa do Programa de Residência em Engenharia Sanitária e Ambiental do Ministério Público de Santa Catarina- MPSC.

\*\* Professora da Universidade do Estado de Santa Catarina (UDESC) (Lages, Brasil). Doutora em Engenharia Agrícola pela Universidade Federal de Santa Maria (UFSM), Mestre em Engenharia de Processos pela Universidade Federal de Santa Maria (UFSM) e Engenheira Ambiental e Sanitarista pela Universidade Franciscana (UFN). Atua como pesquisadora na área de Ciências Ambientais, com ênfase gestão ambiental de processos produtivos e valorização de resíduos.

\*\*\* Professor da Universidade do Estado de Santa Catarina (UDESC), junto ao Departamento de Engenharia Ambiental e Sanitária e no Programa de Pós-Graduação em Ciências Ambientais (PPGCAMB). Possui graduação em Agronomia (1997), mestrado em Economia (2000) e doutorado em Engenharia Florestal (2007). Atua como pesquisador na área de Ciências Ambientais e de Recursos Florestais, com ênfase em Bioenergia, Bioeconomia e na avaliação econômica e ambiental de processos produtivos.

## Abstract

The improper disposal of cigarette butts is a global environmental and public health issue, with approximately 4.5 trillion units discarded every year. In Brazil, the annual production of around 95 million cigarettes exacerbates this environmental harm. Cigarette butts contain filters made of cellulose acetate, which is a slow degrading plastic, as well as toxic substances, such as nicotine, heavy metals, and hydrocarbons, which can contaminate soil and water bodies. Despite this composition, there are both regulatory and technical challenges in formally recognizing cigarette butts as hazardous waste, which limits the implementation of more effective regulatory measures. The present study offers a literature review and documental analysis to examine the regulatory landscape with regards to the management of these waste materials. The results reveal a regulatory gap in Brazil concerning the disposal of cigarette butts, in contrast with the European Union, which has made progress in this regard. The absence of specific legislation, combined with low public awareness and weak enforcement, hampers efforts to address the problem. There is a need for the development of integrated public policies based on shared responsibility among the government, industry, and civil society to ensure the environmentally sound management of cigarette butts as urban solid waste.

**Keywords:** Cigarette butt disposal; Environmental impact; Legal framework; Environmental public policies; Environmental toxicity.

## Resumo

*O descarte inadequado de pontas de cigarro é um problema ambiental e de saúde pública global, com aproximadamente 4,5 trilhões de unidades descartadas a cada ano. No Brasil, a produção anual de cerca de 95 milhões de cigarros agrava esse dano ambiental. As pontas de cigarro contêm filtros feitos de acetato de celulose, um plástico de degradação lenta, além de substâncias tóxicas, como nicotina, metais pesados e hidrocarbonetos, que podem contaminar o solo e os corpos d'água. Apesar dessa composição, existem desafios regulatórios e técnicos no reconhecimento formal das pontas de cigarro como resíduos perigosos, o que limita a implementação de medidas regulatórias mais eficazes. Este estudo oferece uma revisão bibliográfica e análise documental para examinar o cenário regulatório em relação à gestão desses resíduos. Os resultados revelam uma lacuna regulatória no Brasil em relação ao descarte de pontas de cigarro, em contraste com a União Europeia, que fez progressos nesse sentido. A ausência de legislação específica, combinada com a baixa conscientização pública e a fraca fiscalização, dificulta os esforços para resolver o problema. Há necessidade de desenvolvimento de políticas públicas integradas, baseadas na responsabilidade compartilhada entre governo, indústria e sociedade civil, para garantir a gestão ambientalmente correta das pontas de cigarro como resíduo sólido urbano.*

**Palavras-chave:** Descarte de pontas de cigarro; Impacto ambiental; Panorama jurídico; Políticas públicas ambientais; Toxicidade ambiental.

## Summary

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## 1. Introduction

Approximately 4.5 trillion cigarette butts are discarded into the environment throughout the world every year (Lucia et al., 2023), with high concentrations on beaches and in urban areas (Mghili et al., 2023; Yousefi Nasab et al., 2022). This form of solid waste constitutes one of the greatest environmental challenges due to its high resistance to physical and biological degradation (Acarer Arat, 2024). Akhbarizadeh et al. (2021) and Marinello et al. (2020) estimate the existence approximately 967 million smokers globally, with around six trillion cigarettes produced each year to meet this demand. According to the WHO (2024) and Ribeiro et al. (2022), tobacco consumption is found in diverse cultures and societies. The global rise in smoking prevalence drives increased cigarette production, while widespread product availability reinforces consumption patterns and sustains tobacco dependence.

According to data from the Federal Revenue Service, the annual cigarette production in Brazil was approximately 95 billion units in 2024, which is equivalent to around 4.7 billion packs (each containing twenty cigarettes). Although a small portion of this production is exported, domestic consumption accounts for approximately 85 billion cigarettes (Brasil, 2025). However, these figures may be underestimated, as smuggling is driven by the high taxation on this product. Since 2016, official projections and market estimates have shown significant discrepancies (Szklo & Iglesias, 2020; Malta et al., 2021).

All cigarette production ultimately leads to disposal, although the quantity of cigarette butts found in the environment is influenced by factors such as the increased prevalence of tobacco consumption, smoker behavior, the frequency of use of public spaces such as parks, beaches, urban areas, workplaces, and commercial areas, the logistical challenges of specific waste collection, inefficiencies in existing waste management systems, and a lack of public awareness (Ribeiro et al., 2022; Vanapalli et al., 2023).

Cigarettes are composed of cellulose acetate filters, tobacco, and paper. Cigarette filters, made of cellulose acetate, are poorly biodegradable and may take up to 30 years to decompose (Belzagni et al., 2021). After use, they retain toxic substances that leach into soil and water, contributing to microplastic pollution and ecosystem disruption. These contaminants pose risks to human and animal health through ingestion and biomagnification (Dobaradaran et al., 2023; Richardot et al., 2023). Accidental ingestion, particularly by infants and domestic animals, can lead to symptoms such as nausea, vomiting, diarrhea, tachycardia, and seizures (Vanapalli et al., 2023).

The small size of cigarette filters and the wide range of locations where improper disposal occurs increase environmental litter dispersion rates (Vanapalli et al., 2023). Due to the low density, factors such as wind and ocean currents can transport these waste products to distant locations (Acarer Arat, 2024). Novotny et al. (2009) demonstrated that this is often the case with cigarette butts recovered from beaches, which were not necessarily consumed there. In many cases, butts are discarded on sidewalks or thrown from moving vehicles, ending up in storm drains and, eventually, in streams, rivers, and oceans.

Multiple strategies have been proposed to mitigate the environmental impacts associated with the improper disposal of cigarette butts. These include the development of biodegradable filters (Vanapalli et al., 2023), enhancements in waste collection infrastructure, and regulatory measures aimed at promoting behavioral changes among smokers and manufacturers (Barnes, 2011). Novotny et al. (2009) recommend the inclusion of warning labels on cigarette packaging to emphasize the non-biodegradability of filters, as well as the implementation of deposit-return systems to incentivize proper disposal and recycling. Stigler-Granados et al. (2019) and Novotny et al. (2009) also

advocate for taxation policies to finance cleanup operations and discourage tobacco consumption. Legal frameworks may further compel the tobacco industry to develop environmentally responsible products and assume financial responsibility for waste management. Additionally, the imposition of fines for improper disposal serves both as a deterrent and a mechanism to offset public expenditures related to environmental remediation.

Consumer education and responsibility are essential for managing cigarette butt waste, yet behavioral change tends to be slow and influenced by factors such as cost, perceived benefit, and social norms (Vanapalli, 2023). Indoor smoking bans have shifted consumption to outdoor areas, where disposal infrastructure is often lacking. This raises questions about who should provide disposal containers and how to ensure proper waste management. Addressing this challenge requires comprehensive initiatives, including awareness campaigns, installation of collectors, and stricter legislation. Coordinated action among governments, environmental

The World Health Organization recommends integrating tobacco waste management into public health policies through expanded legislation and educational campaigns to mitigate environmental impacts (WHO, 2017; WHO, 2024). Due to the complexity of cigarette butt disposal, regulatory responses vary globally. Several countries, particularly in Europe and Asia, have adopted stricter measures. The European Union, for example, has established guidelines requiring the installation of cigarette butt collectors in public spaces, extending producer responsibility and implementing awareness campaigns to reduce pollution from tobacco-related waste (Portugal, 2024).

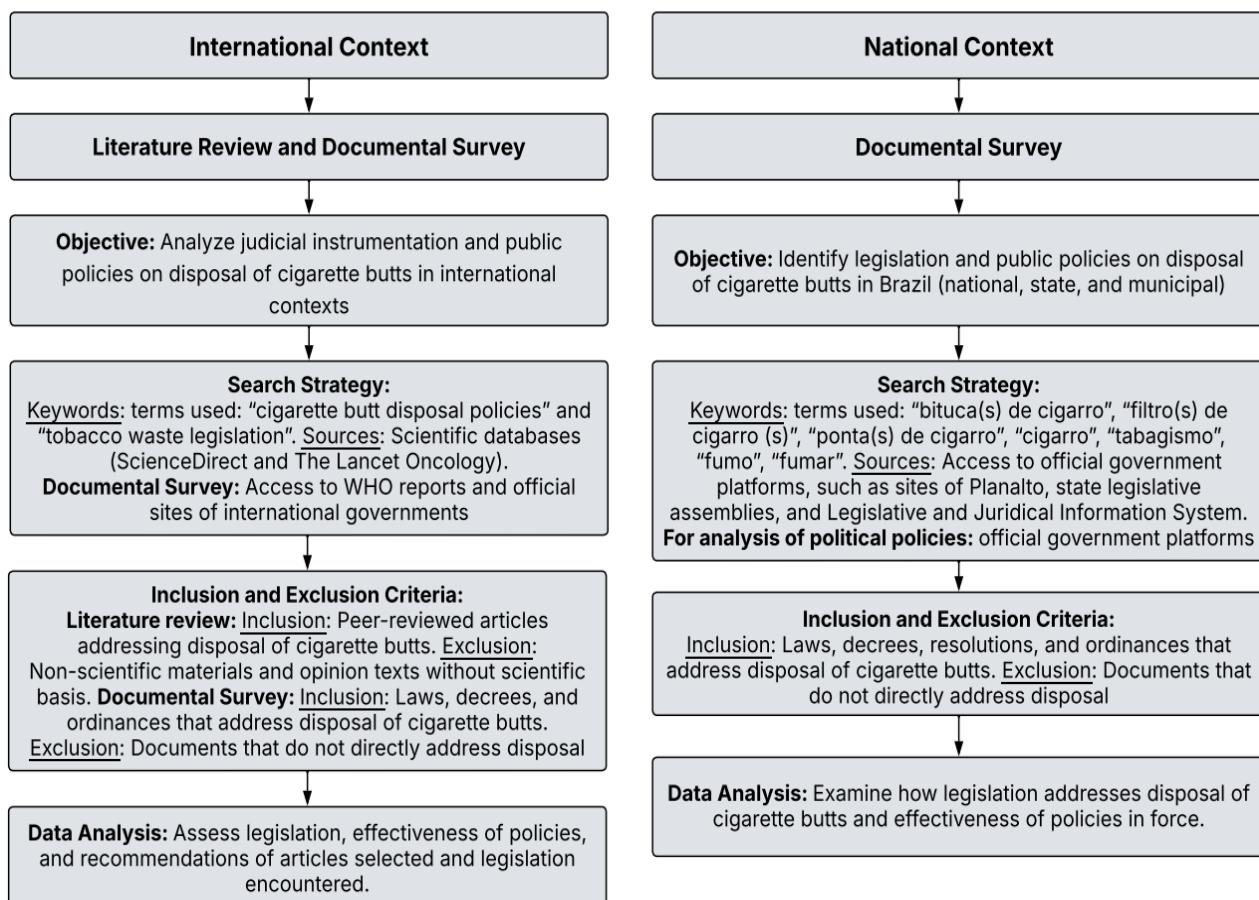
In Brazil, the disposal of cigarette butts is a topic that has been little explored in the legal and public policy spheres, despite its recognized environmental and public health impacts. The National Solid Waste Policy created by Law No. 12,305/2010 establishes the principle of shared responsibility (Brasil, 2010a) for the lifecycle of products but does not explicitly address tobacco product waste. The widespread presence of cigarette butts in public and natural spaces reflects their ubiquity in urban life and a low public perception of their severity. Combined with the lack of specific regulation and weak enforcement, this limits effective action. Investigating the legal and policy frameworks related to cigarette butt disposal is essential to understanding regulatory gaps and proposing viable solutions.

This study emphasizes the need for an integrated approach that goes beyond holding manufacturers accountable, incorporating public awareness strategies and active civil society engagement. Thus, the central question guiding this study is: "What are the existing laws on the disposal of cigarette butts in Brazil and what are their limitations in practice?" Based on this question, the aim is to investigate national and international legal frameworks on the disposal of cigarette butts, assess the effectiveness of public policies aimed at their implementation and monitoring, and identify the main regulatory and institutional flaws. The analysis of these aspects is essential to the support of proposals for improving legislation and public policies that promote more efficient management of tobacco product waste, with the aim of ensuring a healthier, more sustainable environment.

## 2. Methods

This study employed two main methods to examine legal frameworks and public policies related to cigarette butt disposal: literature review and documental survey. Both approaches were designed to address the normative and institutional complexity of the topic at national and international levels. Figure 1 outlines the study objectives, search strategies, inclusion and exclusion criteria, and data analysis procedures.

**Figure 1** – Flowchart of study method: legal and public policy overview related to cigarette butt disposal



Source: Prepared by the authors (2025).

## 2.1 International context

*Literature review:* This exploratory study used a non-systematic search of scientific databases (ScienceDirect and The Lancet Oncology), applying various keyword combinations related to cigarette butt disposal. Nine (9) articles were selected, focusing on international standards and policies. These were analyzed to identify legal instruments, implementation strategies, and outcomes (Table 1).

*Documental survey:* Conducted in two stages: first, regulations cited in the selected articles were identified and used to guide further searches on official government platforms. Second, a World Health Organization report was reviewed, and its references to legal instruments and policies informed additional searches on government websites (Table 1).

**Table 1** – Synthesis of literature review and documental survey on legal instruments and public policies for cigarette butt disposal in international contexts

Literature Review		
Keywords	Articles selected from scientific databases	Countries involved
Tobacco legislation, Tobacco control, Smoking ban, Cigarette butt disposal, Public policy, Smokefree legislation.	<ul style="list-style-type: none"> <li>• New Zealand's world-first smokefree legislation 'goes up in smoke': A setback in ending the tobacco epidemic.</li> <li>• Policy alone is not effective at reducing cigarette filter litter on beaches in Maui, Hawai'i.</li> <li>• Street smoking bans in Japan: A hope for smoke-free cities?</li> <li>• A comparative study of littering and waste in Singapore and Japan.</li> <li>• Challenges and opportunities for greater tobacco control in Japan.</li> <li>• Tobacco Control in Vietnam.</li> <li>• UK Tobacco and Vapes Bill One Step Closer.</li> <li>• Tobacco litter costs and public policy: a framework and methodology for considering the use of fees to offset abatement costs.</li> <li>• Regulating the disposal of cigarette butts.</li> </ul>	England, Vietnam, Singapore, Japan, New Zealand, and the United States (Hawaii).
Documental survey		
Access to WHO reports and international government platforms		
European Union (Spain, Portugal), Australia (Western Australia), Chile, Mexico, and the United States (San Francisco).		

Source: Developed by the authors (2025).

## 2.2 National context

*Documental survey:* The search strategy included a broad set of keywords and synonyms related to tobacco waste disposal, enabling a comprehensive review of existing regulations. Searches were conducted on official platforms such as the Brazilian Presidential Website (Planalto), state legislative assembly websites, and the Brazilian Legislative and Legal Information Network. Only legal norms directly addressing cigarette butt management and disposal were considered. The inclusion criteria comprised current laws, decrees, and ordinances related to tobacco waste disposal, while documents not directly addressing disposal were excluded. The data analysis focused on evaluating existing legislation and assessing the effectiveness of public policies. Although no federal laws or policies were found that specifically regulate cigarette butt disposal, the analysis encompassed broader regulations on urban solid waste, tobacco consumption, and product control. A total of 13 relevant documents were retrieved from official sources. Table 2 summarizes the regulatory and institutional landscape at the state and municipal levels, along with federal policies related to the topic.

**Table 2** – Regulatory and institutional overview of cigarette butt disposal: documental analysis on state and municipal levels and survey of related federal public policies

Scope	Keywords searched	No. of Results Obtained	No. of Exclusions	States Searched	Date of Search	Data source
Municipal	bituca (s) de cigarro (s)", "filtro (s) de cigarro (s)", "ponta (s) de cigarro (s)", "cigarro (s)", "cinzeiro (s)", "tabagismo, "fumo", "fumar", "guimba (s)", "resíduo (s) de tabaco", "resíduo (s) de cigarro (s)", "bituqueira (s)"	116	111	5570	06/11/2024	Brazilian Legislative and Legal Information Network
State		531	520	27	30/10/2024; 01/11/2024; 02/11/2024.	State Legislative Assemblies
Federal	"resíduos de tabaco", "resíduos sólidos", "resíduos" and "controle do tabaco"	13	-	-	15/10/2024; 04/11/2024; 07/11/2024; 09/11/2024	Planalto

Source: Developed by the authors (2025).

### 3. Results

#### 3.1 Scenario in the international context

This study consisted of a literature review and documental analysis of international public policies and legislation related to the disposal and management of cigarette butts, aiming to identify countries with specific regulations on the subject. The investigation included 11 countries across different continents: Europe (Portugal, Spain, and the United Kingdom), Asia (Japan, Vietnam, and Singapore), Oceania (Australia and New Zealand), North America (United States and Mexico), and South America (Chile). Table 3 presents a summary of the main legal and regulatory measures currently in effect or under implementation in these international jurisdictions.

**Table 3** – Main Regulations, Initiatives, and Public Policies on the International Level

Country/Region	Regulations	Objectives/Application and relevance/Public policies and main initiatives
European Union	EU Directive 2019/904 (Single-Use Plastics Directive)	Establishes restrictions, labeling requirements, product standards, and extended producer responsibility based on the principles of the circular economy, with the aim of eliminating and reducing single-use plastics, including tobacco filters (European Union, 2019; Portugal, 2024).
Portugal	Law No. 88/2019 "Lei das Beatas"	Objectives: To establish rules for the proper management of tobacco waste in public spaces and commercial establishments, promoting environmental responsibility and urban cleanliness. Application and Relevance: The law requires business owners to clean waste within their premises and a five-meter radius, covering areas such as restaurants, bars, and educational institutions. The disposal of cigarette butts in public spaces is prohibited, with penalties ranging from €150 to €500 for individuals and higher amounts for companies. Even in smoke-free areas, establishments must provide ashtrays and appropriate waste disposal equipment. In guesthouses or short-term rentals, a single disposal unit is sufficient. The law reinforces accountability through fines for infractions such as lack of ashtrays and inadequate cleaning, reaching up to €1,500. (Portugal, 2019; Portugal, 2020; Portugal, 2024; Portugal, n.d). Public Policies and Main Initiatives: Municipal initiatives, such as Motion 068/01 from the Lisbon City Council and Municipal Assembly, support the classification and proper management of cigarette filter waste. (e.g., Motion 068/01 of the Lisbon City Council and Municipal Assembly: Motion 068/01).

Country/Region	Regulations	Objectives/Application and relevance/Public policies and main initiatives
Spain	Royal Decree 1093/2024 (Management of waste from tobacco products with filters and from single-use filters for tobacco products containing plastic)  Law No. 7/2022 (Waste and contaminated soils for a circular economy)	Objectives: The Royal Decree regulates the management of waste from tobacco products with filters, aligned with United Nations Sustainable Development Goals 12 and 14, which promote sustainable consumption and marine conservation. Law No. 7/2022 complements this by addressing cigarette butts with cellulose acetate filters within the circular economy framework.  Application and Relevance: In line with Regulation (EU) 2019/904, the Royal Decree introduces measures such as smoking bans on beaches, eco-design programs, and waste separation protocols to reduce environmental impact. Law No. 7/2022 targets single-use plastic products, including filtered tobacco items, reinforcing Spain's commitment to plastic reduction and circularity.  Public Policies and Main Initiatives: Municipal councils may restrict smoking on beaches. From 2030, producers with over 2.5% market share must adopt eco-design and prevention programs. A dedicated section in the Product Producer Registry will track filtered tobacco products. By 2025, extended producer responsibility (EPR) will require producers to finance waste collection, treatment, public cleaning, awareness campaigns, data reporting, and infrastructure for proper disposal and material valorization (Spain, 2024).
England (United Kingdom)	Tobacco and Vapes Bill (Environment Bill)	Objectives: The Tobacco and Vapes Bill aims to protect future generations from tobacco-related harm by creating a smoke-free generation. From 1 January 2027, individuals born on or after 1 January 2009 will no longer be legally permitted to purchase tobacco products. The Environment Act 2021 supports this goal by promoting sustainable practices and reducing environmental impacts associated with tobacco and vape waste.  Application and Relevance: The legislation responds to rising tobacco and vape use among youth and seeks to reduce tobacco-related diseases. It includes measures to restrict access, regulate product appeal, and address environmental concerns linked to disposable vapes.  Public Policies and Main Initiatives: Municipal councils may enforce smoking bans in outdoor areas such as playgrounds and near schools. From April 2025, the sale of disposable vapes will be banned to reduce environmental impact and youth usage. The National Health Service (NHS) will offer vape kits and cessation support for adults. Additional measures include restrictions on advertising, flavor regulation, and product display limitations, alongside education and awareness campaigns to prevent nicotine addiction among children and adolescents (Venkatesan, 2024).
Vietnam	Tobacco Control Laws in Vietnam Years: 1989, 2000, 2005, 2009 and 2010	Objectives: Vietnam's tobacco control framework aims to recognize smoking as a public health issue and to promote smoke-free environments. The People's Health Protection Act (1989) prohibits smoking in designated halls, cinemas, theaters, and public places. The National Tobacco Control Programme (NTCP, 2000) seeks to protect the rights of non-smokers to breathe clean air and reduce tobacco-related harm to individuals, families, and society, reaffirming the government's commitment to tobacco control. The Action Plan for the Implementation of the WHO Framework Convention on Tobacco Control (2009) aims to implement the WHO treaty by prohibiting smoking in classrooms, kindergartens, medical facilities, libraries, cinemas, theatres, cultural centers, indoor manufacturing sites, workplaces, public transport, and areas with high fire risk.  Application and Relevance: The Decree No. 45/2005/NĐ-CP promotes tobacco control through administrative sanctions. It establishes warnings or fines ranging from VND 50,000 to 100,000 (US\$3-6) for violations of tobacco policies. Smoking is banned in public places such as theaters, cinemas, meeting rooms, offices, hospitals, libraries, waiting rooms at railway stations, bus stations, airports, ports, and on public transportation. From 2010 onward, smoking was prohibited in all enclosed public places, with rigorous enforcement of sanctions (Tran et al., 2013).  Public Policies and Main Initiatives: Vietnam's tobacco control efforts are based on national legislation and international commitments. Key initiatives include the implementation of smoke-free environments in public and institutional settings, legal instruments for enforcement, and the integration of tobacco control into broader public health strategies. The government applies sanctions, promotes awareness, and aligns its actions with the WHO Framework Convention on Tobacco Control.
Singapore	Environmental Public Health Act (EPHA) (Singapore, 1987)	Objectives: The EPHA aims to promote public health and hygiene by establishing strict standards for public space cleanliness and waste management. Its primary goal is to reduce pollution and ensure a clean, safe environment for all citizens.  Application and Relevance: Originally enacted in 1968 and updated in 1987, the EPHA prohibits littering in public areas, including cigarette butts. Offenses are subject to fines of up to S\$1,000 for a first conviction and up to S\$5,000 for repeat offenses. The law distinguishes between serious offenses (e.g., pollution) and minor ones (e.g., littering). Since 1992, Corrective Work Orders (CWOs) have been implemented, requiring repeat

Country/Region	Regulations	Objectives/Application and relevance/Public policies and main initiatives
		<p>offenders to clean public spaces for up to 12 hours, aiming to reform behavior and reinforce environmental responsibility.</p> <p>Public Policies and Main Initiatives: Singapore's tobacco-related waste control includes public education campaigns, regular inspections, and community cleaning programs. Key initiatives involve CWOs and awareness efforts to educate the public on the environmental impact of waste. These are supported by community events and partnerships with local organizations to promote responsible waste disposal (Ong; Sovacool, 2012).</p>
Japan	Health Promotion Act (Act No. 103 of 2002, revised in 2018)	<p>Objectives: To protect public health by limiting exposure to second-hand smoke in indoor public spaces and reducing tobacco consumption. The Act also encourages the creation of smoke-free environments to improve urban quality of life and includes guidelines for proper disposal of cigarette butts.</p> <p>Application and Relevance: The Act prohibits smoking in indoor spaces such as restaurants, bars, schools, hospitals, and administrative buildings. It establishes designated smoking areas equipped with ashtrays to reduce the environmental impact of cigarette butts.</p> <p>Public Policies and Main Initiatives: Japanese legislation allows municipalities to implement specific regulations for cigarette butt management. Cities such as Tokyo and Osaka have enacted local laws that prohibit smoking in public areas and promote the use of designated smoking zones equipped with ashtrays to ensure proper disposal. Enforcement includes fines for individuals smoking outside these areas. Additionally, public education campaigns inform citizens about the health risks of smoking and the environmental impact of improper disposal. These initiatives are supported by community engagement efforts and partnerships with local organizations to reinforce responsible behavior (Ueda et al., 2011; Tanigaki; Poudyal, 2019).</p>
Australia (Western Australia)	Waste Act (1979) Waste Regulations (1981)	<p>Objectives: To reduce the environmental impact of cigarette butt waste, the most common litter in Australia. The legislation aims to raise awareness of the risks associated with improper disposal, particularly in fire-prone areas.</p> <p>Application and Relevance: Cigarette butts represent approximately 30% of litter in Western Australia, with around seven billion discarded annually. Improper disposal contributes to pollution and is linked to roughly 700 fires per year caused by lit cigarette butts. The legislation prohibits disposal in public areas such as sidewalks and parks, with fines of \$200 under the Litter Act (1979), increasing to \$500 when the act poses a public hazard, such as in dry zones with bushfire risk.</p> <p>Public Policies and Main Initiatives: The law allows fines to be issued by authorized agents, including police officers and rangers, and enables citizen reporting of violations. Non-payment may result in legal action or suspension of a driver's license. These measures aim to promote a cleaner and safer environment. Enforcement is supported by public awareness efforts and community engagement to encourage responsible disposal behavior (Western Australia, 1979; 1981).</p>
New Zealand	Rollback of the Filter Ban and associated regulations to the Smokefree Aotearoa 2025 Action Plan	<p>Objectives: To reduce daily smoking prevalence to below 5% across all population groups by 2025 and eliminate disparities in smoking-related diseases. The plan aims to prevent smoking initiation among children, limit access to tobacco, and reduce the availability, addictiveness, and appeal of smoked tobacco products.</p> <p>Application and Relevance: Previous legislation focused on reducing nicotine content in tobacco products and prohibited the sale and supply of tobacco to minors, with financial penalties for violations. However, it did not address underlying factors such as peer pressure. Enforcement faced challenges due to continued access through adults and the emergence of a black market, limiting the law's effectiveness (Andrew, 2024).</p> <p>Public Policies and Main Initiatives: The Smokefree Aotearoa 2025 Action Plan includes regulatory measures to restrict tobacco access, protect youth, and reduce consumption. Local enforcement targets illegal sales and public education campaigns raise awareness about smoking risks and proper disposal of cigarette waste. The plan emphasizes equity, aiming to reduce smoking rates among vulnerable populations through targeted interventions.</p>
Mexico	General Tobacco Control Law of 2008 General Tobacco Control Law Decree of 2022	<p>Objectives: The 2022 Decree, which came into effect in 2023, aims to implement a complete smoking ban in public spaces to protect public health, with an emphasis on protecting children and adolescents. It strengthens the 2008 law by expanding restrictions and eliminating tobacco advertising.</p> <p>Application and Relevance: The smoking ban applies to parks, beaches, hospitals, healthcare facilities, and food and beverage consumption areas. These measures are designed to reduce exposure to secondhand smoke and promote healthier public environments.</p> <p>Public Policies and Main Initiatives: The decree prohibits all forms of tobacco advertising and empowers citizens to report violations. Oversight is conducted by the Federal</p>

Country/Region	Regulations	Objectives/Application and relevance/Public policies and main initiatives
		Commission for Protection against Health Risks (Cofepris), which monitors compliance and enforces penalties. Compared to the 2008 law, the 2022 update introduces stricter controls, broader public space restrictions, and enhanced citizen participation in enforcement, reflecting Mexico's commitment to tobacco-free environments (Mexico, 2008; Mexico, 2022).
United States (South San Francisco and Hawaii)	San Francisco Administrative Code (Chapter 105: Cigarette Waste Reduction Fee Ordinance) Maui County Ord. 1876 House Bill 24 (County of Maui) House Bill 525 (State of Hawaii)	<b>Objectives and Application:</b> San Francisco: The Cigarette Waste Reduction Fee Ordinance was the first initiative in the U.S. to address the environmental and economic impacts of cigarette butt litter, particularly in coastal tourism areas. It introduced a fee on cigarette packs to fund cleanup efforts. In 2009, cleanup costs were estimated at \$6 million. The fee increased from \$1.00 to \$1.05 in 2022 and to \$1.25 in 2023, with retailers responsible for quarterly collection and remittance. Hawaii/Maui: Legislation prohibits tobacco use in public spaces such as beaches and parks to reduce litter. Ordinance 1876 criminalizes littering, including cigarette disposal, in public and private areas. <b>Relevance:</b> These measures contribute to environmental preservation, public health, and the cleanliness of urban and recreational spaces, directly benefiting tourism and community well-being. <b>Public Policies and Key Initiatives:</b> San Francisco: Implementation of a cigarette fee with annual adjustments; retailer accountability for collection and remittance. Hawaii/Maui: Legislation: Tobacco bans in public recreational areas; Awareness Campaigns: "Tobacco-Free Beaches," funded by NOAA, raised public awareness of environmental impacts; Cleanup Programs: Marine debris monitoring and removal initiatives; Scientific Evaluation: Studies using BACI (Before-After Control-Impact) design assessed policy effectiveness in reducing cigarette filter litter. (Currie; Stack, 2021).
Chile	Law No. 21,413/2022 (Modifies legal bodies that indicate, to avoid contamination with cigarette butts, among other matters) Law No. 19,419/1995 (Anti-Tobacco Law)	<b>Objectives and Application:</b> Law No. 21,413 aims to prevent environmental contamination from cigarette waste. It modifies Law No. 19,419 by introducing specific provisions for waste management in natural public areas. The law prohibits discarding cigarette butts within an 80-meter strip from the high tide line on beaches, rivers, and lakes, and mandates the installation of ashtrays and disposal containers in public spaces. <b>Public Policies and Key Initiatives:</b> Prohibition of cigarette butt disposal in public and open areas; Fines ranging from 1 to 4 monthly tax units; Enforcement by maritime and river police; citizen reporting is permitted; Penalties may include community service focused on environmental cleanup (Chile, 2022). Tobacco Control Measures (Law No. 19,419/1995): Law No. 19,419 regulates tobacco-related activities to reduce consumption and protect public health. Key provisions include: Advertising Restrictions: Prohibited in all media, except at points of sale; Sales to Minors: Forbidden for individuals under 18 years of age; Vending Machines: Permitted only in areas inaccessible to minors; Health Oversight: The Ministry of Health may ban additives that increase health risks. (Chile, 1995)

Source: Prepared by the authors (2025).

### 3.2 Scenario in the national context

The documentary analysis of Brazilian legal frameworks concerning the disposal of cigarette butts encompassed normative instruments at the federal, state, and municipal levels, including laws, decrees, resolutions, and other regulatory acts. The objective was to assess the organizational structure of waste management services and delineate the responsibilities of governmental entities and civil society.

Solid waste management in Brazil is governed by principles such as autonomy and equality, which reflect the distribution of competencies and the operational independence of federative entities. In this context, political decentralization emerges as a strategic necessity, given the country's territorial extension and socioeconomic heterogeneity, factors that pose structural challenges to the implementation and enforcement of environmental public policies. The management of cigarette butts exemplifies this complexity, as regional disparities influence both environmental awareness and the effectiveness of policy execution. On the federal level, the scope of the environmental policies related to solid waste in general was analyzed. The historical representation is shown in Table 4.

**Table 4** – Timeline of main advances in environmental regulations and policies with emphasis on solid waste in Brazil

Year	Event/Legal Framework	Objectives	Application/Relevance
1981	National Environmental Policy (Brasil, 1981)	Preserve, improve, and restore the environment.	First legal structure to address environmental management and solid waste management.
1998	Environmental Crimes Act (Brasil, 1998)	Provide for criminal and administrative sanctions arising from conduct and activities that are harmful to the environment.	Cigarette butts are considered waste. Therefore, disposing of them improperly is considered an environmental violation subject to sanctions such as fines and other penalties.
2005/2006	WHO International Tobacco Control Treaty (FCTC)/ (Brasil, 2006; Brasil, 2022)	Protect present and future generations from the health, social, environmental, and economic consequences of tobacco consumption and exposure to tobacco smoke, and reduce the impacts caused by smoking, including environmental pollution generated by tobacco waste.	Highlights the need for public policies to control smoking and its impacts on the environment. This is considered the first initiative for a global approach to tobacco waste management.
2007	National Guidelines for Basic Sanitation (Brasil, 2007)	Establish guidelines for the organization, management, financing, and provision of basic sanitation services	Focus on universalization and quality of services related to basic sanitation: drinking water, sewage, drainage, and solid waste.
2010	Decree No. 7,217/2010 (Brasil, 2010b)	Establish standards and ensure user satisfaction, ensure compliance with targets, prevent economic abuses, respecting the defense of competition, and define tariffs that balance contracts and encourage efficiency.	Regulates national guidelines for basic sanitation.
2010	National Solid Waste Policy (Brasil, 2010a)	Establish national guidelines for solid waste management.	Establishes shared responsibility among government, companies, and consumers for the proper management of waste.
2011	CONAMA Resolution No. 430 (Brasil, 2011a)	Regulate water quality and effluent discharge standards	The resolution considers waste that negatively impacts water bodies. Scientific studies on pollution caused by cigarette butts in water sources should be taken into account.
2011	Anti-Smoking Law (Brasil, 2011b)	Restrict smoking in enclosed public places to promote public health.	Increased awareness of harm caused by smoking, but with no direct effect on how cigarette butts are discarded.
2014	Decree No. 8,262 (Brasil, 2014)	Regulate the Anti-Smoking Law.	Total ban on smoking in enclosed public and private spaces for collective use throughout the country.
2020	New Legal Framework for Basic Sanitation (Brasil, 2020)	Universalize access to sanitation services by 2033, with an emphasis on privatization and concessions.	Updates sanitation regulations, considering more private investments in the sector and establishing strict goals to achieve universalization of services.
2023	Decree No. 11,599 (Brasil, 2023a)	Detail rules for the implementation of Law No.	Establishes transition rules for the implementation of the new legal framework

Year	Event/Legal Framework	Objectives	Application/Relevance
		14,026/2020, ensuring national regulation.	for sanitation, defining control, monitoring, and evaluation parameters.
2023	Ordinance GM/MS No. 502 (Brasil, 2023b)	Reduce the prevalence of smokers as well as morbidity and mortality associated with smoking.	Establishes the National Tobacco Control Program; which promotes the improvement of actions and services aimed at developing strategies for the prevention, cessation, and treatment of smoking, indirectly contributing to the reduction of solid waste derived from cigarette consumption.

Source: Developed by the authors (2025).

The timeline above shows that the regulatory approach was more comprehensive in earlier years, with growing awareness of environmental issues and specific initiatives regarding the impacts of smoking on health. The National Environmental Policy (Law No. 6,938/1981) and the Environmental Crimes Law (Law No. 9,605/1998) established the legal basis for environmental liability, including the improper disposal of solid waste (Brasil, 1981; Brasil, 1998). In 2006, with the ratification of the WHO Framework Convention on Tobacco Control (Decree No. 5,658/2006), Brazil assumed international commitments that acknowledged the environmental impacts of tobacco, even if indirectly (Brasil, 2006).

From 2007 onwards, national policies began to focus more on urban infrastructure, particularly with the establishment of guidelines for basic sanitation (Law No. 11,445/2007), regulated by Decree No. 7,217/2010 (Brasil, 2007; Brasil, 2010b). A milestone in this context was the enactment of the National Policy on Solid Waste (Law No. 12,305/2010), which introduced principles such as shared responsibility and reverse logistics. This framework imposed joint obligations on manufacturers, importers, distributors, retailers, consumers, and public authorities to minimize the environmental impacts of waste generation (Brasil, 2010a).

Although cigarette butts are not explicitly mentioned in the legislation, they are classified as urban solid waste and may therefore be integrated into selective collection strategies, environmentally appropriate final disposal, and reverse logistics systems, especially considering their polluting potential. In the same year, CONAMA Resolution No. 430/2011 reinforced concerns about water pollution, which can be exacerbated by the improper disposal of cigarette butts in public spaces (Brasil, 2011a).

In addition to environmental regulations, public health policies have also contributed to mitigating the impacts of smoking. The Anti-Smoking Law (Law No. 12,546/2011) and its regulatory decree (No. 8,262/2014) prohibited smoking in enclosed collective-use spaces, reducing both exposure to secondhand smoke and the accumulation of waste in these environments (Brasil, 2011b; Brasil, 2014). In 2020, the New Legal Framework for Sanitation (Law No. 14,026/2020), regulated by Decree No. 11,599/2023, redefined deadlines for universal access to sanitation and established parameters for control, monitoring, and oversight (Brasil, 2020; Brasil, 2023a). More recently, Ordinance GM/MS No. 502/2023 established the National Tobacco Control Program, outlining guidelines for prevention, cessation, treatment, health promotion, and intersectoral coordination for implementing the WHO Framework Convention (Brasil, 2023b).

Despite these advances, the findings reveal a lack of specific regulations for the management of cigarette butts in Brazil. While the National Solid Waste Policy addresses urban solid waste and implicitly includes cigarette butts, there are no legal standards or public policies that directly regulate their disposal, collection, recycling, or potential integration into circular economy strategies.

### 3.3 Scenario in the state context

At the state level, the legal review identified a total of 531 normative acts, of which 520 were excluded after detailed analysis for lacking relevance to the management of cigarette butts, specifically in terms of containment,

collection, transportation, storage, treatment, recycling, or final disposal. Among Brazil's 27 federative units, only nine states have enacted legal provisions that explicitly address this type of waste. Table 5 consolidates these findings.

Table 5 – Brazilian states that have legal standards regarding the disposal of cigarette butts

State	Legal Framework(s)	Objectives/Application and relevance
Espírito Santo	Law No. 719/1953 (guidelines for the actions of the Civil Police of the State of Espírito Santo) (Espírito Santo, 1953)	Objectives: To ensure security and order in the state, preventing and repressing crimes and misdemeanors. The police must act and respect the rights of citizens, promoting a safe, fair environment. Application and Relevance: Cigarette-Related Offenses: Article 67 mentions penalties for behaviors considered inappropriate, such as spitting or throwing cigarette butts in public transportation vehicles, entertainment venues, and public and utility buildings. The fine of Cr\$20.00 for such offenses is a way of discouraging behaviors that may harm collective well-being (Current law).
	Law No. 9,069/2008 (Espírito Santo, 2008)	Objectives: To require medium-size and large commercial establishments to include information about selective waste collection on plastic bags used to package goods, promoting awareness about the correct separation of waste. Application and Relevance: The law applies to all commercial establishments registered with the State Trade Board that use plastic bags and requires these bags to contain visible information about the types of waste, including cigarettes. By addressing responsible disposal, the law promotes awareness about selective waste collection, helping reduce pollution and its environmental impacts. Non-compliance may result in penalties.
Goiás	Law No. 21,552/2022 (Green August) (Goiás, 2022)	Objectives: To establish the month of Green August to promote awareness about fire and burning prevention, highlighting the risks associated with the improper disposal of cigarette butts and other harmful practices. Application and Relevance: During Green August, educational campaigns were carried out, with the distribution of informative materials that seek to reduce the risks of fires and burning. This initiative serves to protect the environment and public health, promoting environmental responsibility among citizens.
Paraná	Law 17,232/2012 (guidelines for the continuous selective collection of solid waste) (Paraná, 2012)	Objectives: To establish standards for the installation of cigarette butt collectors in public places; create partnerships between the government and private sector for the collection and proper disposal of waste; promote educational campaigns on environmental preservation. Application and Relevance: The law applies to places with large crowds, such as beaches and parks. Partner companies are responsible for collecting and treating waste. Its importance lies in reducing pollution caused by improper disposal of cigarette butts, thus contributing to public health and promoting environmental responsibility in society.
Pernambuco	Law No. 17,645/2022 (Prohibits the improper disposal of cigarette filters) (Pernambuco, 2022)	Objective: To prohibit the improper disposal of cigarette filters and any type of waste on public roads as well as in squares and parks in the state of Pernambuco. Application and Relevance: The law prohibits the disposal of tobacco-derived smoking products in public places, aiming to preserve cleanliness and public health. The penalty for those who fail to comply with the law is R\$70.00 per filter improperly discarded, promoting environmental responsibility and raising awareness about the impacts of urban waste. The amounts of the fines will be updated annually according to the Broad Consumer Price Index or other federal index that replaces it.
Piauí	Law No. 8,235/2023 (Gray August) (Piauí, 2023)	Objective: To establish "Gray August" as a month to raise awareness and promote events on preventing and combating fires and burning. Application and Relevance: Every year in August, the government, through its agencies and the Military Fire Department, will carry out educational and awareness-raising activities for the population. The law informs about the consequences of improperly discarding cigarette butts, which can cause fires. During "Gray August", informative materials will be distributed that address the risks associated with throwing poorly extinguished cigarette butts on land and highways, in addition to promoting safe soil management and fire prevention practices.

State	Legal Framework(s)	Objectives/Application and relevance
Rio de Janeiro	Law No. 7313/2016 (Disposal and Collection of Cigarette Filters for Recycling) (Rio de Janeiro, 2016)	Objectives: To establish a system for the disposal and collection of cigarette filters and other byproducts of tobacco consumption, prioritizing recycling and prohibiting disposal on public roads.  Application and Relevance: The law determines that industries and retailers of tobacco products must ensure the proper collection of cigarette filters, considered tobacco byproducts. The executive branch may establish partnerships with cooperatives and companies specialized in recycling, prioritizing busy areas and places designated for smoking. The disposal of filters on public roads is prohibited, with fines of 50 UFIRs-RJ, which double in the event of a repeat offense. Companies must display informative posters and may be fined 100 UFIRs-RJ for non-compliance. The fines are allocated to the State Environmental Conservation Fund.
Rio Grande do Sul	Resolution no. 3,059/2010 (Rio Grande Do Sul, 2010)	Objective: To establish a selective solid waste collection system.  Application and Relevance: The classification of waste includes cigarette butts and ashes as part of organic waste. This waste must be separated and disposed of appropriately, contributing to the responsible management of solid waste.
	Law No. 12,733/2007 (Rio Grande Do Sul, 2007)	Objective: To make it mandatory to print information about selective collection on plastic bags used by commercial establishments with an area greater than 1,000 m <sup>2</sup> in cities with selective collection.  Application and Relevance: Promotes the separation of solid waste into dry, organic, and special waste and how to dispose of it correctly by displaying information on plastic bags. Cigarette butts and ashes were classified as organic waste. The inclusion of this information aims to raise awareness about proper disposal, promoting recycling and composting and contributing to a cleaner, more sustainable environment.
Sergipe	Law No. 6,533/2008 (Deals with disciplinary rules in prisons) (Sergipe, 2008)	Objective: To establish disciplinary rules in prisons, including a ban on throwing cigarette butts in the yards.  Application and Relevance: Applies to all prisons in the state of Sergipe, helps maintain order and cleanliness in prisons, and reinforces the importance of proper waste disposal.
São Paulo	Decree No. 67,398/2022 (Reformulates the Pro-Connection Program) (São Paulo, 2022)	Objective: To provide financial support for the construction of intra-household branches aimed at connecting low-income families to the public sewage system.  Application and Relevance: Although the main focus is on sewage, the decree also implies that it is the duty of citizens not to dispose of cigarette butts in the sewage system.

Source: Developed by the authors (2025).

Brazil is administratively divided into five geographic regions – North, Northeast, Central-West, Southeast, and South – each characterized by distinct socioeconomic, cultural, and environmental profiles. The distribution of state-level legislation concerning cigarette butt disposal is markedly uneven across these regions. The North Region, comprising seven states, does not present any legal instruments related to the topic. In the Northeast Region, three out of nine states – Pernambuco, Piauí, and Sergipe – have specific laws addressing the issue. In the Central-West Region, only the state of Goiás has enacted relevant legislation. The Southeast Region demonstrates the highest concentration of legal norms, with three of its four states – Espírito Santo, Rio de Janeiro, and São Paulo – having adopted specific regulations. The South Region, although composed of only three states, matches the Southeast in terms of quantity, with Paraná and Rio Grande do Sul also presenting legal provisions on the matter.

Of particular note is the state of Espírito Santo, which holds the oldest legislation currently in force related to cigarette butt disposal – Law No. 719, enacted in 1953. This regional disparity in regulatory coverage highlights the absence of a standardized legal framework and underscores the need for greater normative harmonization among federative entities to ensure consistent and effective management of this pollutant across the national territory.

### 3.4 Scenario in the municipal context

Brazil currently has 5,570 municipalities (Brasil, 2024). On the local level, the search retrieved a total of 115 results, 111 of which were excluded after careful analysis due to not being related to cigarette butts or the management of this type of waste, such as collection, transportation, storage, treatment, recycling, and final disposal. Among the 5,570 Brazilian municipalities, only five have any legal norm that mentions the issue of disposal. Table 6 shows the legal norms identified in the municipalities of Domingos Martins (state of Espírito Santo), Jundiaí (state of São Paulo), Florianópolis (state of Santa Catarina), Mangaratiba (state of Rio de Janeiro), and São Marcos (state of Rio Grande do Sul).

**Table 6** – Brazilian municipalities with legal regulations regarding the disposal of cigarette butts

City/State	Legal framework	Objectives/Application and relevance
Domingos Martins/Espírito Santo	Municipal Law No. 2.267/2010 (Domingos Martins, 2010)	Objectives: To establish the installation of communal ashtrays in front of bars, restaurants, and other commercial establishments with large crowds of people. Application and Relevance: The rule states that waste and cigarette butts must be placed in trash cans with ashtrays, which will be installed in front of bars, restaurants, and other establishments with large crowds of people. The establishments may complement the installation of trash cans on their sidewalks and may include advertising. The executive branch may establish partnerships with companies to finance trash cans in exchange for advertising. Before the installation, a campaign will be carried out to inform the public about the risks of cigarette butts, especially in relation to water pollution in case of rain.
Jundiaí/São Paulo	Law No. 7862/2012 (Jundiaí, 2012)	Objectives: To require the provision of containers for the collection of cigarette butts and similar items in specified locations. General public: prohibit the disposal of cigarette butts in public spaces; Traders: require the installation of containers for the collection of cigarette butts; Business owners: responsible for providing receptacles for customers; Smokers: required to dispose of butts correctly. Application and Relevance: The law requires that commercial establishments that sell tobacco products provide suitable containers for collecting cigarette butts, especially in crowded areas. This measure aims to promote responsible disposal and prevent pollution on public roads. The prohibition of disposing of other waste in these containers ensures that only cigarette butts are collected and the material can be recycled, if the government is so interested. The relevance of this legislation stands out in promoting public health and preserving the environment. By encouraging proper disposal, the law promotes the reduction of pollution and the risks associated with the accumulation of waste. Fines for non-compliance — R\$200.00 for establishments and R\$50.00 for citizens — serve as a strong incentive for compliance, reinforcing collective responsibility in maintaining urban cleanliness and contributing to raising awareness about waste management.
Florianópolis/Santa Catarina	Law No. 8900/2012 (Florianópolis, 2012)	Objectives: To establish the installation of cigarette butt collection bins on public sidewalks near the entrances to the premises of direct and indirect public administration bodies and entities. The standard seeks to promote urban cleanliness, improve collective well-being, and encourage practices such as selective collection and recycling of this waste. Application and Relevance: Allows private companies to participate in the adoption of cigarette butt collection systems, with the possibility of institutional disclosure, as long as ethical and legal restrictions are respected. The law also provides for the creation of a committee responsible for the collection and proper disposal of waste, reinforcing the environmental commitment of the public administration. Its relevance resides in its contribution to environmental preservation, the promotion of civic duty, and the valorization of public spaces, making them cleaner and more organized and making the public more conscious.
Mangaratiba/Rio de Janeiro	Law No. 1.163/2018	Objectives: To establish the reuse and recycling of cigarette filters and other components of any smoking product, whether or not derived from tobacco. This includes the separate collection of this waste, with the aim of promoting its proper final destination, which is

City/State	Legal framework	Objectives/Application and relevance
	(Mangaratiba, 2018)	<p>recycling to produce new materials. The law seeks to prohibit the improper disposal of filters on public roads.</p> <p>Application and Relevance: The law is enforced by the government, which may establish partnerships with the private sector to optimize the reuse of these materials. The law also provides for the installation of specific trash cans for the disposal of filters in strategic locations, especially in areas designated for smoking in public buildings. It prohibits the disposal of cigarette filters on the ground in streets, squares, parks, and any public areas. By promoting the recycling of cigarette filters, the law aims to reduce pollution and negative environmental impacts. The prohibition of improper disposal and the installation of specific trash cans encourage environmental responsibility among citizens and establishments. Partnerships with cooperatives and specialized companies strengthen waste management.</p>
São Marcos/Rio Grande do Sul	Complementary Law No. 64/2021 (Code of Conduct) (São Marcos, 2021)	<p>Objectives: To establish conduct regarding small-scale waste and cigarette butts and ensure proper disposal, promoting cleanliness and organization on streets as well as in parks and municipal squares by requiring commercial establishments to install trash cans with ashtrays.</p> <p>Application and Relevance: Maintaining urban cleanliness and protecting public health. Installing trash cans with ashtrays in strategic locations facilitates proper disposal, reducing pollution and improving the aesthetics of public areas. Furthermore, imposing fines for non-compliance with the rules serves as an incentive for both establishments and citizens to adopt more conscious behaviors. Banning smoking indoors protects the health of the population, creating a safer, healthier space for everyone.</p>

Source: Developed by the authors (2025).

## 4. Discussion

An analysis of legal instruments and public policies related to cigarette butt management reveals structural, regulatory, and behavioral challenges. Internationally, initiatives encompass urban solid waste management, tobacco control, environmental monitoring, education campaigns, and investments in infrastructure for the collection, and appropriate final destination of this type of waste. The growing awareness of the environmental impacts of cigarette butts has led to pressure on the tobacco industry to internalize environmental costs through Extended Producer Responsibility (EPR), which imposes responsibility on manufacturers for the full lifecycle of the waste generated by their products (Barnes, 2011; Stigler Granados et al., 2019; Vanapalli et al., 2023).

Despite these initiatives, the management of cigarette butts remains a global challenge, largely due to the small size, ease of dispersion in the environment, and tendency to mix with other waste (Vanapalli et al., 2023). These factors hinder both selective collection and public awareness, as the environmental impacts of cigarette butts are often underestimated compared to other urban solid waste. Although cigarette butts are classified as urban solid waste in Brazil, the scientific literature characterizes them as hazardous waste due to the high pollutant load, toxicity, and low biodegradability (Marinello et al., 2020; Vanapalli et al., 2023; Doan et al., 2024).

The lack of specific legal standards that address the management of cigarette butts –including containment, collection, transportation, treatment, final disposal, and possibilities for circularity, such as recycling and reuse – shows regulatory insufficiency in Brazilian legislation. This omission may stem from limited social and political awareness of the environmental and health risks, reducing pressure for targeted regulations. Furthermore, factors such as technical-operational feasibility, costs, and logistical challenges for installing collection points, creating efficient recycling systems, and carrying out structured educational campaigns contribute to the lack of effective public policies. The influence of the tobacco industry on policymaking is another relevant obstacle, hindering the approval of laws that impose additional responsibilities on manufacturers (Ueda et al., 2024; Tanigaki and Poudyal, 2019).

From a behavioral perspective, the improper disposal of cigarette butts is associated with cultural practices and consolidated habits among smokers. The lack of appropriate containers in public spaces, combined with the restriction of smoking in indoor environments, contributes to the disposal of cigarettes on public streets, squares, and beaches. The act of smoking, which is often ritualized, reinforces automatic and unconscious disposal behaviors, making it difficult to internalize environmentally responsible practices (Novotny et al., 2009). Although relevant, public health measures, such as the prohibition of the sale of cigarettes to minors, are not enough to mitigate the problem, especially given the possibility of indirect access through third parties (such as adults) and the risk of the expansion of illicit trade in tobacco products (Venkatesan, 2024).

Andrew (2024) points out that the formulation of more restrictive laws faces political pressures and economic interests, in addition to practical obstacles such as the growth of the illegal tobacco market. This highlights the need for integrated strategies that combine regulatory actions, awareness campaigns, support for the cessation of smoking, and approaches adapted to the socioeconomic situations of smokers. The experience of Maui, Hawaii, demonstrates that simply enacting legislation is not enough to induce behavioral changes. A lack of enforcement, inadequate infrastructure, and the social acceptance of smoking compromise the effectiveness of local policies (Currie & Stack, 2021). Although there is no specific international convention that deals exclusively with cigarette butts, European countries have made progress through multilateral agreements and integrated legislation that connect tobacco control with policies to reduce plastics and manage urban solid waste. However, such measures are subject to discontinuity due to changes in government and pressure from economic sectors (Andrew, 2024; Ueda et al., 2024; Tanigaki & Poudyal, 2019).

An analysis of state legislation in Brazil reveals an asymmetrical distribution of regulations across the different regions of the country. Only 11 of the 27 states have legal provisions that mention the disposal of cigarette butts, with a greater concentration in the Southeast and South regions. In contrast, the North region does not have any regulatory initiative on the subject. This disparity highlights not only regional differences in terms of institutional capacity and environmental prioritization, but also the lack of national guidelines. Although some states have made specific advances, such as educational campaigns, the installation of collectors, and incentives for recycling, an overall fragmented approach is seen, which is disjointed from integrated policies for solid waste and public health.

The situation is starker on the municipal level. Only five of the 5,570 Brazilian municipalities have legal regulations that address, albeit incipiently, the disposal of cigarette butts. The actions identified focus on installing ashtrays or cigarette butt receptacles, requiring containers in commercial establishments, and planning awareness campaigns. Despite constituting significant efforts, these measures are isolated and lack coordination with selective collection systems, reverse logistics, or waste recovery strategies. The scarcity of local regulations can be attributed to the absence of structural national policies, limited technical and financial resources – especially in small municipalities – and low institutional awareness of the environmental and health impacts of this waste.

State and municipal policies focus predominantly on measures to control consumption, such as banning smoking in closed environments and restricting advertising. There are few cases in which the management of cigarette butts is addressed in a systemic, structured manner. The absence of specific operational flows, lack of integration with recycling and environmental education policies, as well as budgetary and logistical limitations compromise the effectiveness of the actions. In this scenario, the contributions of civil society, academic institutions, and partnerships with the private sector offer innovative solutions, although limited in scope and scale. Although relevant, such initiatives prove to be insufficient, poorly regulated, and with little capacity for consolidation and expansion without the support of structured public policies.

Initiatives in this regard tend to be mostly non-governmental in nature and operate in isolation, without coordination with institutional waste management systems. An example of this is the work of the University of Brasília, a pioneer in Brazil in developing a strategy in partnership with the company Poiato Recicla (Ortiz, 2019) for collecting and recycling cigarette butts, using patented technologies aimed at recovering this waste. Moreover, initiatives by civil society stand out, such as the association “Mundo sem Bitucas [World without Cigarette Butts]” (Goettlicher, 2022), which promotes educational and social mobilization actions. Collective and individual actions aimed at cleaning public

spaces, such as urban areas and beaches, are also seen, with the aim of mitigating the environmental impacts caused by the inadequate disposal of this waste. However, the lack of regulatory support and continuous funding limits the sustainability and large-scale replicability of these actions.

The formulation of effective public policies requires the incorporation of scientific evidence, a critical analysis of international experiences, and adaptation to local specificities. As stressed by Thuan et al. (2024) and Andrew (2024), it is essential to consider social, economic, cultural, and political contexts when implementing regulatory strategies. Currie and Stack (2021) state that standardization alone does not ensure the effectiveness of policies and that such policies must be integrated with environmental education, accountability, and community engagement actions. A coherent national policy based on the principles of shared responsibility and sustainability is needed to mitigate the environmental and health impacts of cigarette butts in Brazil.

## 5. Final considerations

The problem of improper disposal of cigarette butts in Brazil reveals a significant gap in terms of regulation and effective public policies. There is a lack of support and coverage for the management and control of this waste in the country as a whole. The lack of legislation on the federal, state, and municipal levels allows the problem to persist, perpetuating the environmental and public health impacts. Coordinated policies need to be developed among governments to understand the characteristics of this waste and how it will be managed from production to final disposal.

An analysis of international experiences shows that it is possible to implement specific regulations, but these must consider solutions that are appropriate to local specificities and needs. There is a need for a clear analysis of the problem, considering deficiencies and potentialities. The creation of selective collection systems, the implementation of sustainable, viable technologies that can be replicated, and raising public awareness are essential measures for mitigating the problem. Moreover, shared responsibility among the tobacco industry, private companies, and civil society is essential.

The analysis shows that the main difficulties encountered when addressing the issue of cigarette butts include the lack of knowledge on the part of the population about the environmental impacts, disregard for social trends in behaviors linked to smoking culture, and the negligence of smokers and non-smokers in relation to the issue. The tobacco industry also exerts a negative influence on the implementation of public policies. However, the potential needs to be characterized, which includes the development of sustainable technologies, public-private partnerships, and environmental education. It is essential for obstacles to be overcome and opportunities to be seized in order to create practical solutions to manage this waste that can be replicated on a large scale with economic viability.

Based on the comparative analysis of international experiences, the following regulatory proposals are presented to enhance the effectiveness and applicability of cigarette butt management in Brazil:

i) **Reclassification as Hazardous Waste:** It is recommended that cigarette butts be reclassified as hazardous waste, replacing the current categorization as common urban solid waste, due to their high pollutant load, toxicity, and low biodegradability. This reclassification aims to ensure stricter and more appropriate treatment, compatible with the environmental and public health risks associated;

ii) **Terminological Standardization and Multichannel Communication:** It is suggested to adopt a single official term to designate cigarette butts, considering the existing national linguistic diversity (e.g., bituca, guimba, filtro). Terminological standardization is essential to ensure technical, legal, and communicational precision, avoiding ambiguities in the drafting of regulations, public policies, and environmental management systems;

iii) **Social Mobilization and Engagement of Strategic Stakeholders:** Engage relevant social actors – such as public agencies, the private sector, civil society organizations, educational institutions, and consumers – through educational, participatory, and collaborative actions. This mobilization aims to foster behavioral changes, expand shared responsibility in cigarette butt management, and strengthen the acceptance and effectiveness of the proposed reclassification;

iv) **Regulatory Instruments and Accountability Mechanisms:** The public policy must be formalized through specific legal instruments, with provisions for administrative sanctions and clear obligations:

- Individuals: Fines for improper disposal in public roads, natural areas, or collective spaces. Recurrence increases the penalty. In addition to the fine, the individual may be required to participate in educational or corrective actions, such as involvement in community clean-up efforts;
- Businesses and Commercial Establishments: Fines for the absence of proper receptacles for collection and for failing to clean a defined perimeter (e.g., 5 meters) around their premises. These establishments must include this waste in their waste management plans.
- Regulation of Smoking Areas:
  - Indoor environments: Maintain the prohibition of smoking in enclosed collective-use spaces;
  - Outdoor environments: Prohibit smoking in public leisure areas, with the establishment of designated smoking zones, clearly marked and equipped with appropriate receptacles (ashtrays and/or butt bins).
- Inspection and Monitoring:
  - Establish a dedicated channel, accessible to any citizen, for reporting improper disposal of cigarette butts;
  - This channel may be digital (app, website, or integration with municipal platforms) and should allow georeferenced registration of infractions, facilitating the actions of competent authorities;
  - Inspection will be carried out by environmental and health agencies, with authority for immediate enforcement;
  - These agencies must be trained to apply administrative sanctions as provided by law;
  - Monitoring will be supported by a performance indicator system, which should include: number of recorded infractions; recurrence rate; volume of cigarette butts collected; number of commercial establishments meeting infrastructure requirements (ashtrays/butt bins and external cleaning);
  - These data should be consolidated in periodic, public, and accessible reports, allowing for evaluation and continuous improvement of the management policy.

v) Integrated Management and Valorization of Cigarette Butts: Management must cover all stages of the waste lifecycle:

- Collection: Installation of specific collectors in public and private locations;
- Transportation: Specialized logistics, with public-private partnerships and licensed companies;
- Final Disposal with Circularity: Transformation of cigarette butts into raw materials, avoiding landfill disposal, with incentives for valorization alternatives, either through innovative technologies or alternative reuse strategies aligned with circular economy principles. These approaches include advanced physicochemical processes such as hydrothermal carbonization, pyrolysis, and energy recovery, which represent innovations in waste treatment and reuse. Creative initiatives also stand out, such as incorporating the waste into construction materials, urban furniture, and sustainable design objects, which, although not technologies in the strict sense, contribute to mitigating environmental impacts.

These preliminary proposals, based on comparative analyzes and adapted to the Brazilian context, aim to fill regulatory gaps and promote effective, scalable, and sustainable solutions for cigarette butt management. Their implementation may contribute to environmental protection, public health, and the advancement of circular economy practices in urban waste governance. However, these strategies can be further refined and strengthened through more

in-depth studies, pilot programs, and interdisciplinary research, ensuring their long-term viability and adaptability to diverse regional realities.

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