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BETWEEN INCENTIVE AND OBSTACLE: ENVIRONMENTAL LEGISLATION AND ITS IMPACTS ON ORGANIZATIONAL SUSTAINABILITY – A SYSTEMATIZED LITERATURE REVIEW[1]

ENTRE INCENTIVO E ENTRAVE: A LEGISLAÇÃO AMBIENTAL E SEUS IMPACTOS NA SUSTENTABILIDADE DAS ORGANIZAÇÕES – UMA REVISÃO SISTEMATIZADA DA LITERATURA

Lucas Di Paula Gama dos Santos[2] *Paulo Roberto Ramos*[3]

ABSTRACT

This research evaluates, through a systematized literature review, the main aspects of Brazilian environmental legislation that simultaneously function as instruments for promoting sustainability and as barriers to organizational competitiveness. The central problem investigated consists of analyzing how Brazilian environmental legislation acts simultaneously as an instrument for promoting sustainability and as a barrier to organizational competitiveness, especially in the national corporate context. The study aimed to examine the dual effects of legislation on innovation, competitiveness, and organizational ethics, investigating how regulations can promote sustainable development or limit business activities. Methodologically, this was a bibliographic study, based on a systematized literature review in databases such as SciELO, CAPES, and Google Scholar, with texts selected according to criteria of relevance, recency, and theoretical consistency. The results indicate that legal instruments such as the National Environmental Policy (Law No. 6,938/1981), the National Solid Waste Policy (Law No. 12,305/2010), and CONAMA resolutions have contributed to strengthening environmental governance, disseminating reverse logistics, and encouraging the pursuit of environmental certifications. However, challenges related to bureaucracy, legal uncertainty, and high compliance costs persist, hindering the effective internalization of a sustainability culture. Thus, although legislation is essential for ecological preservation, it has an ambivalent nature that requires greater integration with inclusive public policies and ethical and innovative business strategies.

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[2] Universidade Federal do Vale do São Francisco. lucas.di@discente.univasf.edu.br
[3] Universidade Federal do Vale do São Francisco. paulo.ramos@univasf.edu.br



Keywords: environmental regulation, Sustainability, public policies, companies, socio-environmental responsibility.

RESUMO

Esta pesquisa avalia, por meio de revisão sistematizada da literatura, os principais aspectos da legislação ambiental brasileira que funcionam simultaneamente como instrumentos de incentivo à sustentabilidade e como barreiras à competitividade organizacional. O problema central investigado consiste em analisar que forma a legislação ambiental brasileira atua, simultaneamente, como instrumento de incentivo à sustentabilidade e como barreira à competitividade organizacional, especialmente no contexto corporativo nacional. O estudo teve como objetivo examinar os efeitos duplos da legislação sobre a inovação, a competitividade e a ética organizacional, investigando como as normas podem promover o desenvolvimento sustentável ou limitar a atuação empresarial. Metodologicamente, tratou-se de uma pesquisa bibliográfica, fundamentada em revisão de literatura sistematizada em bases como Scielo, CAPES e Google Scholar, com seleção de textos a partir de critérios de relevância, atualidade e consistência teórica. Os resultados indicam que instrumentos legais como a Política Nacional do Meio Ambiente (Lei nº 6.938/1981), a Política Nacional de Resíduos Sólidos (Lei nº 12.305/2010) e as resoluções do CONAMA contribuíram para o fortalecimento da governança ambiental, a difusão da logística reversa e a busca por certificações ambientais. No entanto, persistem desafios relacionados à burocracia, à insegurança jurídica e aos altos custos de conformidade, que dificultam a efetiva internalização de uma cultura de sustentabilidade. Assim, a legislação, embora essencial à preservação ecológica, apresenta natureza ambivalente que requer maior integração com políticas públicas inclusivas e estratégias empresariais éticas e inovadoras.

Palavras-chave: norma ambiental, sustentabilidade, políticas públicas, empresas, responsabilidade socioambiental.

INTRODUCTION

In recent decades, sustainability has become established as one of the main global agendas, both in the political and organizational spheres. The intensification of climate change, environmental degradation, and the growing demand for socio-environmental responsibility have been pressuring companies to adopt management models that are more committed to the environment and



society (Barbieri; Cajazeira, 2022). In the contemporary corporate scenario, sustainability has ceased to be merely a competitive advantage, becoming a requirement for business legitimacy and longevity.

In Brazil, according to Milaré (2020), this movement takes on particular contours due to the complexity and scope of environmental legislation. Considered one of the most comprehensive in the world, Brazilian environmental regulation encompasses everything from the licensing of economic activities to waste management standards, emission standards, and the use of natural resources. Thus, understanding the interaction between the regulatory framework and corporate sustainability strategies is essential to analyze whether legislation acts predominantly as an inducer of good practices or as an obstacle to organizational development.

The academic literature recognizes that the adoption of sustainable practices generates benefits both for society and for organizations. For Elkington (1997), the idea of sustainability is based on the balance of the economic, social, and environmental dimensions, the concept of triple bottom line. In Brazil, Barbieri and Cajazeira (2022) reinforce that socio-environmental management is no longer optional, constituting today a strategic dimension for companies that wish to remain competitive.

On the other hand, environmental legislation is viewed from different perspectives. For Milaré (2020), it has an essentially protective and preventive character, seeking to reconcile economic development with the preservation of natural resources. Seiffert (2017) and Costa and Carvalho (2021), in turn, point out that regulatory complexity can generate legal uncertainty, high compliance costs, and operational challenges, especially for small and medium-sized enterprises. Recent studies reinforce that, although regulation stimulates advances in sustainability, its unequal and bureaucratic application can limit innovation and competitiveness (Oliveira; Gonçalves, 2021).



Based on this, the literature converges on the understanding that environmental legislation plays an ambiguous role: at the same time that it promotes sustainable practices, it also imposes barriers that impact business dynamics. Although environmental legislation is a fundamental instrument for inducing socio-environmental responsibility, there is still uncertainty as to the extent to which it functions as an incentive to sustainability or as an obstacle to business development.

The relevance of this study lies in the need to analyze how Brazilian environmental legislation acts simultaneously as an instrument for encouraging sustainability and as a barrier to organizational competitiveness. This issue unfolds into specific aspects that include: the mechanisms through which environmental standards can stimulate innovations and sustainable practices; the obstacles that regulatory complexity imposes on organizations; and the conditions under which legislation can be optimized to maximize its positive effects and minimize obstacles.

This is a strategic topic not only for strengthening more effective public policies, but also for helping managers interpret legislation as an opportunity for innovation and value creation, and not merely as a cost or legal obligation. Furthermore, the critical analysis of this relationship makes it possible to contribute to the academic and social debate on how to align economic development and environmental preservation in the Brazilian context.

This article was prepared through a systematized literature review, based on a careful selection of studies published in databases such as Scielo, CAPES Journal Portal, and Google Scholar, using specific keywords related to the topic. Inclusion and exclusion criteria were applied for the selection of texts, considering the relevance, recency, and methodological quality of the studies. This approach allowed for a critical analysis and synthesis of the main theoretical contributions, in addition to identifying gaps for future research.



Thus, the objective of this research was to examine, through a systematized literature review, the main aspects of Brazilian environmental legislation that function as incentives and obstacles to the sustainability of organizations. As specific objectives, it seeks to: (a) identify the legal instruments that are most effective in promoting sustainable practices; (b) analyze the main regulatory obstacles faced by organizations in implementing sustainability strategies; and (c) examine the empirical evidence on the impacts of environmental legislation on organizational competitiveness and innovation.

METHODOLOGY

This article was prepared to investigate the relationship between Sustainability, Environmental Legislation, and Organizations, and was constructed based on systematic literature review approaches, with emphasis on the analysis of the context and institutional role, as outlined in studies addressing sustainable development and entrepreneurial ecosystems. According to Gil (2008), this approach allowed for a critical analysis and synthesis of the main theoretical contributions, in addition to identifying gaps for future research.

Type and nature of the research

This study adopts the Scoping Review as its main type of research, characterized as a systematic literature review. According to Gil (2008), the scoping review is aimed at mapping scientific production on a specific topic, allowing the identification of the effectiveness of policies and the understanding of how transformations have been associated with sustainability in different regional contexts.

In its nature, the research also included the analysis of qualitative approaches which, according to Minayo (2017), are appropriate for investigating



complex and contextualized phenomena characterizing activities involving human beings, their institutions, and social relations, as topics intrinsically linked to sustainability, organizations, and the necessary regulatory environmental legislation. The incorporation of indicators adapted to the Brazilian reality is seen as an essential strategy for fulfilling sustainability commitments.

Research strategy and method

The research method will be based on systematic guidelines, such as the PCC protocol (Population - Concept - Context), used for the formulation of the research question and subsequent delimitation of the search. Additionally, the methodological strategy incorporated an understanding of the importance of context. It is crucial to recognize that, in the study of the relationship between organizations and environmental legislation, successful models from other locations should not simply be exported but rather adapted to local conditions and structures (social, political, and economic).

To support the analysis of the role of organizations, it is relevant to consider the Entrepreneurial Ecosystem perspective, defining it as a combination of social, political, economic, and cultural elements within a given region, which support the development of companies and the assumption of risks in high-risk ventures.

Phases of the applied scoping review

The research phases followed a systematic and transparent process, according to the typical stages of a review:

Formulation of the Research Question: Established based on the PCC acronym, directing the focus toward the intersection between environmental legislation (policies and regulatory frameworks), sustainability (practices), and the role of organizations (companies, universities, institutions).



Definition of Eligibility Criteria: Establishment of clear criteria for inclusion and non-inclusion of studies.

Systematic Search: Conducted in relevant databases, including Google Scholar, Scopus Web of Science (SciELO), and CAPES Journal Portal, using pertinent thematic descriptors (such as “sustainability,” “environmental legislation” / “environmental standard” / “environmental regulation” and “organization” / “company” / “institution”). The research results are summarized in Table 1.

Table 1: Research results by databases

Database	Descriptor field	Total articles
Scielo	Article title	8
Capes	Article title	33
Google acadêmico	Article title	1
Total		**42**

Source: Prepared by the authors.

Most of the scientific production located in the search is concentrated in the last five years. Of the total articles found, 40% were published between 2020 and 2025 (17 articles), 24% were published between 2015 and 2019 (10 articles), 26% were published between 2010 and 2014 (11 articles), and the remaining 10% in years prior to 2010.

Another relevant piece of information concerns the location where they were produced. Of the total manuscripts found, 71% were produced in the South-Southeast region (30 articles), with 4 articles in the Midwest (approximately 10%) and 2 articles each for the North and Northeast regions, highlighting the scarcity of manuscripts produced in these regions. For the remaining percentage, the place of origin was not identified.

Selection and Filtering: Initial filtering by title and removal of duplicates, followed by reading the abstracts and, subsequently, selection according to eligibility criteria.



Full Reading and Data Extraction: Complete reading of the selected manuscripts. Data extraction involved identifying the objectives, format, year of publication (2010-2025), type of methodology (qualitative, case study, survey, etc.). In total, 15 manuscripts were used.

Compilation and Data Analysis: Compilation of data in forms developed specifically for systematizing the information. The analysis aimed to identify patterns, challenges, gaps, and how organizations, under the legal context, contribute to or hinder the advancement of sustainability.

Methodological limitations: This research presents limitations related to the focus on secondary literature, potential language and selection bias, and methodological heterogeneity of the studies conducted, which prevent quantitative meta-analysis. Dependence on published sources may underestimate practical experiences not academically documented. Future research should conduct sectoral empirical studies and cost-benefit analyses of regulatory compliance, especially in small and medium-sized enterprises.

SYSTEMATIC LITERATURE REVIEW

Sustainability in the organizational context

Sustainability, etymologically derived from the Latin sustentare (to support, preserve in good condition, maintain), is the quality of that which is sustainable, capable of being supported and maintained (Fabio and Oliveira, 2024). According to Nascimento (2012), in the organizational and social context, this notion emerged from the realization that the current production and consumption model cannot endure, and that human activities have caused negative impacts on the environment and the use of natural resources.



Historical evolution and incorporation into the corporate environment

The evolution of ecological concern intensified from the late 1940s onward, but gained international prominence in 1972, at the Stockholm World Conference, where the expression ecodesvelopment was used (Ferreira, 2011). However, the defining milestone of the most widespread concept of sustainability is attributed to the Brundtland Report (Our Common Future), published in 1987, which defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Sirvinskas, 2017). The publication of this report highlighted that the prevailing economic growth models were ecologically unviable, requiring a new economic policy (Senado, 2012).

For Campos et al. (2020), the incorporation of sustainability into the corporate environment was driven by the rigor of environmental legislation and by the perception that growing global consumption would require far more natural resources than those currently available. Concern with socio-environmental responsibility gained visibility in the early 1990s, following the World Industry Conferences on environmental management (1984 and 1991).

Currently, according to Silva, Reis and Amâncio (2011), sustainability has become a prerequisite for effective development in various sectors. Adapting to the new demands of society and the market — where consumers seek environmentally friendly products — has become fundamental. The same authors further state that the survival of organizations depends on the ability to integrate sustainability concepts, going beyond mere legal compliance, to develop an ethical vision that respects environmental limits and considers the legacy for future generations. Historically, this internalization within organizations can be categorized into stages: from the initial recognition of the problem (1970s-90s) to the assimilation of the agenda with proactive and transparent actions (1992-



2012), culminating in the current stage, where the topic becomes embedded in the organization's way of thinking, and not merely in isolated practices.

The economic, social, and environmental tripod

The notion of sustainability according to Boff (2012), in the context of organizations, is disseminated and anchored in three inseparable pillars or dimensions, known as the Triple Bottom Line (or Three Ps: People, Planet, Profit), a concept created by the British John Elkington in 1990, as shown in Chart 1.

Chart 1: Three Pillars

Economic Sustainability	Encompasses the efficient allocation and management of resources. At the organizational level, it refers to the company's ability to remain economically viable, generating solid financial results and being attractive to investments, but without degrading the environment. The aim should be to live from the "income" provided by the resources of the biosphere and not from its natural "capital" (Campos et al., 2020).
Social Sustainability	Deals with the consolidation of a development process that is beneficial to society as a whole, promoting equity, income distribution, and the improvement of social rights. It assumes that all members of society live in dignified conditions, encompassing concern for employees and the community in which the organization is located (Campos et al., 2020).
Environmental/Ecological Sustainability	Advocates reducing the use of non-renewable resources and the compatibility of the production and consumption model with the material basis of the economy. It involves environmental preservation, ecological balance, and the sustainable use of natural resources, minimizing the negative impacts of business activities (Campos et al., 2020).

Source: Prepared by the authors.

The challenge for organizations in the 21st century is precisely to reconcile economic growth with environmental preservation and social equity, seeking a dynamic balance among these aspects. Corporate sustainability requires companies to operate efficiently, generating long-term value and contributing to the solution of environmental and social problems.



Environmental legislation: principles, evolution, and scope

For Ferreira (2011), concern with the environment gained international prominence from the late 1940s onward, but it was in the 1970s that political and state actors, together with the emergence of green parties, boosted the environmental agenda. In the organizational context, the increasing rigor of environmental legislation worldwide has driven the adoption of actions, such as the implementation of Reverse Logistics Systems, and has become one of the factors forcing companies to seek healthier practices.

Principles and the historical overview in Brazil

Brazilian environmental law, aimed at development, understanding, basic guidelines, and environmental protection, finds its pillars in the Federal Constitution of 1988 (CF/88) and in international treaties (Brasil, 1988).

The CF/88 ensured, in its Article 225, the fundamental right to an ecologically balanced environment, which is essential for the quality of human life. This right is intrinsically linked to the fundamental right to life and the protection of human dignity.

The initial milestone of systemic environmental legislation in the country is the National Environmental Policy (PNMA), established by Law No. 6,938, of August 31, 1981 (Brasil, 1981). The PNMA reinforces the purpose of preserving, improving, and recovering public heritage so that collective use is ensured, protecting ecosystems and areas threatened by degradation (Brasil, 1981).

Brazilian legislation, according to Fernades (2024), is structured around fundamental principles that seek to regulate anthropogenic actions and the negative impacts caused to the natural environment:

Principle of Sustainable Development: Adopted by the CF/88, it assumes that development must balance three dimensions: economic growth,



environmental preservation, and social equity. Its objective is to ensure that future generations have access to natural resources, coexisting with population and economic growth.

Principle of Prevention and Precaution: Due to the fact that environmental damage is often irreparable and irreversible, it is preferable to prevent its occurrence. Prevention requires prior analysis of known impacts, allowing modifying measures, while precaution is applied when there is no scientific certainty about possible facts, requiring protection for the benefit of future generations.

Polluter Pays Principle: This is a mechanism for allocating responsibility for environmental costs. The polluter or predator has the obligation to correct, repair and/or compensate for the damage caused, regardless of fault, pursuant to Art. 4 of Law No. 6,938/81. The National Solid Waste Policy (PNRS) also incorporates the principles of prevention, precaution, and polluter-pays.

Scope, mechanisms, and decentralization

The scope of Brazilian environmental legislation is broad and is operationalized through various instruments and agencies, which promote the decentralization of management:

The Role of CONAMA Resolutions: The National Environmental Council (CONAMA) plays a fundamental regulatory role, establishing technical guidelines and criteria (Conama, 1986). CONAMA Resolution No. 1, of January 23, 1986, for example, defined the legal guidelines for Environmental Impact Assessment (AIA), establishing the Environmental Impact Study (EIA) and the Environmental Impact Report (RIMA). The RIMA, which must be clear and objective, reflects the conclusions of the EIA, detailing the consequences, objectives, and compatibility of the project with government policies (Conama, 1986).



CONAMA also operates on specific issues, such as waste management. CONAMA Resolution No. 307/2002 (and its amendments) established guidelines for the management of Construction Solid Waste (RCC) (Brasil, 2010). Likewise, CONAMA Resolution No. 362, of 2005, regulates the collection and disposal of used or contaminated lubricating oil (OLUC), defining re-refining as the environmentally appropriate final destination (Fabio and Oliveira, 2024).

The National Solid Waste Policy (PNRS) and Shared Responsibility: Law No. 12,305, of August 2, 2010 (PNRS), established shared responsibility among generators (legal entities and individuals), public authorities, and the business sector in waste management. The PNRS prioritizes non-generation of waste, followed by reduction, reuse, recycling, and environmentally appropriate final disposal of rejects (Brasil, 2010).

Decentralization and Management Instruments: Environmental protection and inspection are a shared responsibility between IBAMA and state and municipal environmental agencies.

Instruments such as Economic-Ecological Zoning (ZEE) and Ecological ICMS promote the decentralization of management. The ZEE, legally established (including Law No. 6,938/81), serves as a spatial management tool aimed at territorial planning that is more consistent with its physical and socioeconomic characteristics, assisting in directing productive activities (Brasil, 1981).

The Ecological ICMS is a fiscal instrument that encourages municipalities to better manage their preservation or conservation areas. States such as Paraná, São Paulo, Rio Grande do Sul, Minas Gerais, and Rondônia have adopted this mechanism, allocating part of the ICMS to municipalities that contain Conservation Units, generating an economic incentive for local environmental management.



The necessary balance and regulatory challenges

Environmental legislation in Brazil seeks a dynamic balance between economic growth and environmental conservation. The objective of environmental law is to reconcile these factors, so that development is efficient, satisfies future society, and is ecologically balanced (Campos et al., 2020).

However, this requirement imposes significant regulatory challenges on private organizations, as shown in Chart 2.

Chart 2. Regulatory challenges

Legal Compliance x Ethical Sustainability:	Organizations are required to adapt to and comply with environmental legislation. However, the real challenge is to go beyond mere legal compliance. Corporate sustainability requires an ethical vision that respects environmental limits and considers the legacy for future generations.
Internalization of Costs and Innovation:	The rigor of standards, such as those related to reverse logistics or waste, forces companies to implement systems and processes that generate costs. To achieve competitiveness, companies need to innovate and respond quickly to demands for environmentally friendly products.
Preventive Management and Licensing:	Companies that carry out activities with the potential for exploitation of natural resources must be aware of preservation and use preventive actions, such as pollutant emission control technologies. Environmental licensing (authorization granted for potentially polluting activities) must comply with current environmental zoning and consider the maintenance of quality standards. In the construction sector, for example, legal compliance requires the preparation and implementation of Waste Management Plans (PGRCC), determining proper disposal and licensing at all stages.
The Dominant Financial View:	Despite the sustainability discourse, many companies face criticism for focusing on legal compliance merely as a way to avoid punishment or for reducing environmental investments to mere cost-reduction actions for their own benefit, aiming to increase the profit margin. The mere association of sustainability with compliance with environmental legislation is seen as an individualistic anthropocentric stance.

Source: Prepared by the authors.

Legislation, by requiring companies to comply with standards and commit to repairing damage (such as the polluter pays), acts as a coercive force to mitigate socio-environmental impacts, but full sustainability requires environmental concern to transcend regulatory obligations, integrating itself into the organization’s strategy and ethical culture.



Environmental legislation and corporate socio-environmental responsibility

Socio-environmental Responsibility (RSA) is defined as the commitment of organizations to society and the environment, materialized through sustainable and social action, and is intrinsically related to the concept of sustainability in business (Oliveira; Gonçalves, 2021). Although corporate sustainability requires an ethical stance, for Costa and Carvalho (2021), environmental legislation acts as a fundamental, often coercive, force for the institutionalization of these practices in the business environment.

The influence of legal standards and encouragement of compliance

The increasing rigor of environmental legislation has driven organizations to adopt a series of actions, such as the implementation of Reverse Logistics Systems (SLR). Legislation establishes guidelines for waste management, such as CONAMA Resolution No. 307/2002 and the National Solid Waste Policy (PNRS), which define the responsibility of generators, requiring them to consider costs and the reduction of environmental impacts (Brasil, 2010).

Based on this, environmental compliance is encouraged, referring to compliance with laws and regulations, being an internal corporate grouping that establishes rules to prevent or reduce risks of violating environmental laws. Environmental legislation provides for instruments such as Environmental Impact Assessment (AIA), which uses the Environmental Impact Study (EIA) and the Environmental Impact Report (RIMA), and the polluter-pays principle, which obliges the agent to repair or compensate for the damage caused, regardless of fault. The simple need to comply with legal parameters to avoid punishment and keep the business viable already forces companies to adopt prevention and control measures.



Governance, transparency, and sustainability strategies

Legislation also brings the legal field closer to sustainability strategies by requiring transparency and accountability. For Barbieri and Cajazeiras (2016), concern with corporate image and the attraction of investors (stakeholders) pressure companies to disclose environmental information.

This is reflected in corporate governance, especially in the ESG (Environmental, Social and Governance) model, or ASG in Brazil. Governance (G) in ESG requires the maintenance of independent boards, transparency, definition of clear corporate conduct, and legal rigor. Principles such as ethics, transparency, equity, and corporate responsibility guide the governance model and meet sustainability requirements (Barbieri and Cajazeiras, 2022). Stock exchanges, such as B3, suggest that companies follow the Global Reporting Initiative (GRI) standards for issuing sustainability reports, reinforcing the socio-environmental agenda (B3, 2017).

Corporate Social Responsibility practices are guided, in this sense, by the commitment to adopt ethical behavior and contribute to economic development, improving the quality of life of employees, their families, and the community (Barbieri and Cajazeiras, 2022). Environmental accounting, in turn, complements this orientation, being an offshoot of accounting science dedicated to identifying, measuring, and clarifying events related to environmental protection, preservation, and recovery (Fabio and Oliveira, 2024). The same authors further mention that, by recording and publishing qualitative and quantitative reports, environmental accounting contributes to reducing impacts and provides information that helps entities meet legal and social requirements.

Despite legislation encouraging this alignment, the results of studies indicate that many companies, when complying with the law, frequently reduce environmental investments to cost reduction for their own benefit, aiming to increase the profit margin (Antonovz, 2014). Thus, corporate sustainability



transcends mere compliance with environmental legislation, imposing the challenge of developing an ethical vision that respects environmental limits, ensuring the legacy for future environmental generations, ensuring the legacy for future generations.

Environmental legislation as an incentive to sustainability

Brazilian environmental legislation incorporates several mechanisms that function as direct and indirect incentives for the adoption of sustainable practices by organizations. This section analyzes the main regulatory instruments that have demonstrated effectiveness in promoting organizational sustainability.

Economic and fiscal instruments

The Ecological ICMS represents one of the most innovative instruments of Brazilian environmental policy, creating direct fiscal incentives for municipalities that maintain conservation units or develop environmental policies. Initially implemented in Paraná in 1991, the mechanism was subsequently adopted by more than 15 Brazilian states, demonstrating its effectiveness in promoting sustainable practices (Loureiro, 2020).

The experience of the state of Minas Gerais with the Ecological ICMS illustrates how fiscal instruments can induce significant behavioral changes. Between 2009 and 2019, the state recorded a 23% increase in the area of municipal conservation units, directly correlated with the fiscal incentives offered (INSTITUTO ESTADUAL DE FLORESTAS, 2020).

Green credit programs, although still incipient in Brazil, are beginning to demonstrate significant potential as incentive instruments. The ABC Program (Low Carbon Agriculture), created in 2010, offers subsidized credit lines for sustainable agricultural practices, having financed more than R$ 25 billion in projects by 2023 (BANCO CENTRAL DO BRASIL, 2023).



Certifications and environmental standards

Brazilian environmental legislation has indirectly stimulated the development of a robust market for environmental certifications. ISO 14001, the international standard for environmental management systems, showed a 180% increase in the number of certifications in Brazil between 2010 and 2020, a direct reflection of regulatory and market pressures (INMETRO, 2021).

The Brazilian forestry sector exemplifies how regulation can stimulate the adoption of high environmental standards. The requirement for sustainable forest management plans, imposed by Law No. 12,651/2012 (Forest Code), significantly boosted the pursuit of *Forest Stewardship Council* (FSC) certifications, which increased from 6.5 million certified hectares in 2010 to more than 11 million in 2020 (FSC BRASIL, 2021).

Innovation induced by regulation

The National Solid Waste Policy (Law No. 12,305/2010) demonstrates how regulations can stimulate technological innovations and sustainable business models. The mandatory reverse logistics for various sectors boosted the development of recycling and material reuse technologies.

The packaging sector illustrates these characteristics in an exemplary manner. According to data from the Brazilian Packaging Association (ABRE), investments in recycling technologies grew by 340% between 2010 and 2020, directly motivated by the PNRS criterion (ABRE, 2021).

The Brazilian automotive industry also presents evidence of innovation caused by regulation. The Air Pollution Control Program for Motor Vehicles (PROCONVE), established by CONAMA Resolution No. 18/1986 and its subsequent updates, stimulated investments exceeding R$ 15 billion in emission control technologies between 1990 and 2020 (ANFAVEA, 2021).



Corporate socio-environmental responsibility

Brazilian environmental legislation has functioned as improved for the development of comprehensive corporate socio-environmental responsibility strategies. Law No. 10,165/2000, which establishes the Environmental Control and Inspection Fee (TCFA), created incentives for companies to adopt proactive environmental management practices as a way of reducing regulatory costs.

Companies that implement certified environmental management systems can obtain reductions of up to 90% in the TCFA, creating direct economic incentives for the adoption of sustainable practices (IBAMA, 2020). This mechanism has been stimulated especially by small and medium-sized companies to invest in environmental management.

Environmental legislation as an entry to competitiveness

Despite the incentives incorporated into Brazilian environmental legislation, several aspects of the regulatory framework function as significant obstacles to organizational competitiveness. This section examines the main specific obstacles in the literature and their implications for different economic sectors.

Bureaucratic complexity and slowness of licensing

Brazilian environmental licensing is frequently cited as one of the main regulatory obstacles faced by organizations. A study conducted by the National Confederation of Industry (CNI) in 2019 agreements that the average time for obtaining environmental licenses in Brazil varies between 18 months and 4 years, depending on the type of activity and the complexity of the enterprise (CNI, 2019).

The overlap of competencies among federal, state, and municipal agencies significantly aggravates this situation. Companies frequently need to obtain authorizations from several government bodies, with criteria that may be



contradictory or redundant. The mining sector exemplifies this complexity: a typical mining project requires approvals from at least 8 different agencies, with processing that can exceed 10 years (IBRAM, 2020).

Compliance costs and financial impacts

The costs associated with environmental compliance represent a significant portion of business investments in various sectors. Research conducted by the Federation of Industries of the State of São Paulo (FIESP) in 2021 estimated that environmental compliance costs comprise, on average, 3.2% of the gross revenue of industrial companies, reaching 8% in resource-intensive sectors (FIESP, 2021).

Small and medium-sized enterprises face disproportionately greater impacts, since fixed compliance costs are not diluted in smaller production volumes. According to studies conducted by SEBRAE (2020), SMEs spend, proportionally, 2.3 times more than large companies to meet the same environmental requirements.

Legal uncertainty and regulatory changes

The instability of the Brazilian environmental regulatory framework constitutes a significant source of uncertainty for business investments. Between 2010 and 2020, more than 150 federal environmental standards (laws, decrees, resolutions) were enacted, frequently changing compliance parameters (MINISTÉRIO DO MEIO AMBIENTE, 2021).

The Forest Code (Law No. 12,651/2012) illustrates how regulatory changes can generate prolonged uncertainties. Changes in the rules for Legal Reserve and Permanent Preservation Area carried out an adaptation period that extended for more than 8 years, with significant impacts on the agricultural and forestry sector.



Specific sectoral barriers

Different economic sectors face specific regulatory challenges that can significantly compromise their competitiveness. The chemical sector, for example, faces particularly complex regulation due to the risks associated with its products and processes.

CONAMA Resolution No. 430/2011, which establishes effluent discharge standards, imposes additional costs estimated at R$ 12 billion on the Brazilian industrial sector for the adaptation of treatment systems (ABIQUIM, 2020). Although necessary from an environmental point of view, the standard created itself competitively competitive for the national industry in relation to competitors subject to less stringent standards.

The electric power sector faces specific challenges related to the licensing of hydroelectric power plants and transmission lines. The average licensing time for a hydroelectric power plant in Brazil is 8.5 years, compared to 3.2 years on average in OECD countries (ANEEL, 2020).

Comparative analysis: synthesis of findings

Incentive versus obstacle matrix

The analysis of the literature allows the construction of a comparative matrix that systematizes the main mechanisms through which Brazilian environmental legislation influences organizations, as shown in Chart 3.



Chart 3: Incentive vs Obstacle Matrix of Environmental Legislation

Instrument	Incentive Effect	Obstacle Effect	Empirical Evidence
Ecological ICMS	Direct fiscal incentives	Design complexity	23% increase in CUs (MG, 2009-2019)
Environmental Licensing	Legal certainty	Bureaucratic slowness	Average time: 18months to 4 years
PNRS – Reverse Logistics	Stimulus to innovation	Implementation costs	340% growth investments (2010-2020)
PROCONVE	Technological innovation	Quality costs	R$ 15 billion invested (1990-2020)
TCFA Fee	Cost reduction	Additional tax burden	Reduction of up to 90%for certified companies

Source: Prepared by the authors.

Moderating factors

The analysis in addition to several factors that moderate the effects of environmental legislation on organizations:

Organizational Size: Large companies demonstrate greater capacity for regulatory transformations into competitive advantages, while SMEs face disproportionately greater challenges in compliance costs.

Sector of Activity: Sectors intensive in natural resources (mining, pulp and paper, chemicals) face stricter regulation, but also greater opportunities for innovation and differentiation.

Orientation toward International Markets: Exporting companies tend to acquire environmental regulation as less burdensome, since high environmental standards are increasingly required in international markets.

Regional Institutional Capacity: States and municipalities with greater institutional capacity are able to implement legislation more efficiently, reducing transaction costs for companies.

Research gaps identified

The systematized literature review revealed significant gaps that limit a more comprehensive understanding of the impacts of environmental legislation



on Brazilian organizations. First, there is a scarcity of quantitative studies capable of accurately measuring the costs and benefits arising from environmental regulation on organizational performance. Most of the research identified adopts qualitative approaches, based on perceptions and theoretical analyses, which restricts the formulation of objective and comparable diagnoses across economic sectors.

Another relevant point is the absence of longitudinal analyses that monitor the effects of regulation over time. Existing investigations tend to adopt short time frames, which prevents the observation of structural transformations and business adaptations in the face of environmental policies. This limitation reduces the ability to understand the evolution of sustainability practices in response to regulatory changes and market pressures.

Additionally, a limited international comparison was observed, since few studies analyze the effectiveness of Brazilian environmental regulation in relation to policies in other countries. The absence of this comparative perspective makes it difficult to identify good practices and regulatory innovations that could be adapted to the national context, in addition to restricting the debate on the global competitiveness of Brazilian companies in the face of international environmental standards.

Finally, there is insufficient analysis of small and medium-sized enterprises (SMEs), which face particular challenges in implementing sustainable practices and adapting to legal requirements. The scarcity of research focused on this segment fails to encompass a significant portion of the national economy, limiting the formulation of specific public policies and support strategies. These gaps highlight the need to broaden the methodological and thematic scope of investigations, in order to deepen the understanding of the real impacts of environmental legislation and its interface with corporate sustainability.



FINAL CONSIDERATIONS

The present research aimed to analyze how environmental legislation influences sustainability practices in organizations, identifying whether it acts as an incentive to socio-environmental responsibility or as an obstacle to business development. Throughout the study, it was possible to observe that the Brazilian legal framework plays an ambiguous role: on the one hand, it constitutes an important instrument for inducing sustainability; on the other, it can constitute an obstacle, especially due to regulatory complexity and the costs associated with compliance.

The results show that Brazilian environmental legislation, structured around principles such as sustainable development, precaution, and polluter-pays, has been fundamental to the consolidation of environmentally responsible corporate practices. Instruments such as environmental licensing, the National Solid Waste Policy (Law No. 12,305/2010), and the National Environmental Policy (Law No. 6,938/1981) imposed guidelines that stimulated the adoption of clean technologies, reverse logistics systems, and governance models based on transparency. In sectors such as timber and industry, it was found that such requirements function as catalysts for innovation, process improvement, and competitive gain.

However, the analysis also reveals that the application of environmental legislation still faces significant practical challenges. Bureaucracy, the slowness of licensing processes, conflicts of competence among inspection agencies, and the lack of regulatory clarity generate legal uncertainty and discourage voluntary adherence by companies. In addition, many organizations interpret compliance with legislation only as a coercive obligation, which limits the internalization of a genuine sustainability culture. This anthropocentric and economicist behavior reduces the reach of environmental policies and compromises their effectiveness as an instrument of transformation.



In view of this scenario, it was possible to conclude that Brazilian environmental legislation is simultaneously an incentive and an obstacle: an incentive when internalized as a strategic opportunity for innovation and competitiveness; an obstacle when reduced to a mere bureaucratic control apparatus. For it to fully fulfill its role as a promoter of sustainable development, it is necessary to strengthen coordination among the State, the productive sector, and civil society, in order to ensure coherence and applicability of the standards.

As recommendations, it is proposed to the public authorities: (a) institutional simplification and integration, that is, implementing integrated licensing systems that reduce overlaps among agencies and streamline approval processes, especially for enterprises with lower environmental impact; (b) tiered compliance regimes, developing differentiated regulatory regimes according to company size, offering simplified procedures and extended deadlines for small and medium-sized enterprises; (c) subsidy and technical support programs creating public programs that subsidize compliance costs for SMEs and offer technical assistance for the implementation of sustainable practices; (d) conditional fiscal incentives, by expanding mechanisms such as the Ecological ICMS, creating federal fiscal incentives conditioned on the environmental performance of companies; (e) public-private dialogue mechanisms, establishing permanent forums for dialogue among government, companies, and civil society for the continuous improvement of environmental regulation.

Finally, future research may deepen the understanding of the economic and operational impacts of environmental legislation on different productive sectors, especially in micro and small enterprises. A comparative study between environmental legislation in different countries and its effects on competitiveness and corporate socio-environmental responsibility is also suggested. This investigative continuity is essential to consolidate public policies and business



strategies that harmonize economic growth and environmental preservation, pillars of truly sustainable development.



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