




LEGAL AND CONSTITUTIONAL PRINCIPLES IN THE MUNICIPAL LEGISLATURE FOR SUSTAINABLE CLIMATE POLICIES

PRINCÍPIOS JURÍDICOS E CONSTITUCIONAIS NO LEGISLATIVO MUNICIPAL PARA POLÍTICAS CLIMÁTICAS SUSTENTÁVEIS

PRINCIPIOS LEGALES Y CONSTITUCIONALES EN LA LEGISLATURA MUNICIPAL PARA POLÍTICAS CLIMÁTICAS SOSTENIBLES

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ABSTRACT

Climate change poses a global challenge that demands coordinated actions across all levels of government, including the municipal level. This article analyzes the legal and constitutional principles underpinning the development of sustainable climate laws and policies by Brazilian municipal legislatures, focusing on mitigation and adaptation strategies. Through a systematic literature review grounded in doctrine, jurisprudence, and regulations such as the 1988 Federal Constitution of Brazil (CF/1988), the study explores Articles 225 (right to an ecologically balanced environment), 23, and 30 (federative competencies), examining principles such as sustainability, prevention, and polluter-pays. The analysis highlights how municipal autonomy, integrated into cooperative federalism, enables legislation on urban planning, renewable energy, and resilience to extreme weather events. Examples from Brazilian cities, such as São Paulo and Recife, illustrate practical applications, while international influences, such as the Paris Agreement, reinforce the legitimacy of these actions. However, challenges such as budgetary constraints and jurisdictional conflicts persist. The findings identify gaps in local implementation and suggest reforms to strengthen municipal legislative capacity. This work contributes to the debate on multilevel climate governance, providing insights for more effective local policies aligned with global commitments.

Keywords: Climate Change. Constitutional Environmental Law. Municipal Legislature. Sustainable Policies. Federalism.

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RESUMO

As mudanças climáticas representam um desafio global que exige ações coordenadas em todos os níveis de governo. Este artigo analisa os princípios jurídicos e constitucionais que embasam a elaboração de leis e políticas climáticas sustentáveis pelo Poder Legislativo Municipal no Brasil, com foco na mitigação e adaptação climática. Desse modo, partindo de uma revisão sistemática de literatura, fundamentada em doutrina, jurisprudência e normas como a Carta Magna, o estudo explora os artigos 225 (direito ao meio ambiente equilibrado), 23 e 30 (competências federativas) da Constituição Federal, observando os princípios de sustentabilidade, prevenção e poluidor-pagador. A análise destaca como a autonomia municipal, integrada ao federalismo cooperativo, permite legislar sobre planejamento urbano, energias renováveis e resiliência a eventos extremos. Exemplos de cidades brasileiras, como São Paulo e Recife, ilustram aplicações práticas, enquanto influências internacionais, como o Acordo de Paris, reforçam a legitimidade dessas ações. Entretanto, desafios como limitações orçamentárias e conflitos de competência persistem. Os resultados das bibliografias apontam lacunas na implementação dessas políticas e sugerem reformas, para fortalecer a capacidade legislativa municipal. Este trabalho contribui para o debate sobre governança climática multinível, oferecendo subsídios para políticas locais mais eficazes e alinhadas aos compromissos globais.

Palavras-chave: Mudanças Climáticas. Direito Constitucional Ambiental. Poder Legislativo Municipal. Políticas Sustentáveis. Federalismo.

RESUMEN

El cambio climático representa un desafío global que requiere una acción coordinada en todos los niveles de gobierno. Este artículo analiza los principios legales y constitucionales que sustentan el desarrollo de leyes y políticas climáticas sostenibles por parte de la Legislatura Municipal brasileña, con un enfoque en la mitigación y adaptación climática. Con base en una revisión sistemática de la literatura, fundamentada en doctrina, jurisprudencia y normas como la Constitución, el estudio explora los artículos 225 (derecho a un medio ambiente equilibrado), 23 y 30 (poderes federales) de la Constitución Federal, observando los principios de sostenibilidad, prevención y el sistema de quien contamina paga. El análisis destaca cómo la autonomía municipal, integrada con el federalismo cooperativo, posibilita la legislación sobre planificación urbana, energías renovables y resiliencia ante eventos extremos. Ejemplos de ciudades brasileñas como São Paulo y Recife ilustran aplicaciones prácticas, mientras que influencias internacionales, como el Acuerdo de París, refuerzan la legitimidad de estas acciones. Sin embargo, persisten desafíos como las restricciones presupuestarias y los conflictos de jurisdicción. Los resultados de las bibliografías destacan las deficiencias en la implementación de estas políticas y sugieren reformas para fortalecer la capacidad legislativa municipal. Este trabajo contribuye al debate sobre la gobernanza climática multinivel, ofreciendo perspectivas para políticas locales más eficaces y alineadas con los compromisos globales.

Palabras clave: Cambio Climático. Derecho Constitucional Ambiental. Legislatura Municipal. Políticas Sostenibles. Federalismo.

1 INTRODUCTION

Climate change poses one of the biggest threats to global sustainability, impacting ecosystems, economies, and communities at all scales. In Brazil, the Federal Constitution of 1988 (CF/1988) establishes, in its article 225, the right to an ecologically balanced environment, as a fundamental principle, attributing shared responsibilities among the federative entities, for its protection (BRASIL, 1988). In this context, municipalities, as autonomous entities (art. 30, CF/1988), play a crucial role in the elaboration of laws and policies that promote the mitigation of greenhouse gas emissions and adaptation to extreme weather events, such as floods and droughts. However, the municipal legislative capacity to address these issues remains underexplored in the legal literature, especially from the perspective of constitutional foundations.

The relevance of this study lies in the need to understand how the legal and constitutional principles of sustainability, prevention and polluter pays support the performance of the legislative power, at the municipal level, in climate policies. In this sense, Silva (2020) points out that the CF/1988 enshrines a model of cooperative federalism that allows municipalities to legislate on matters of local interest, including environmental protection. This competence is reinforced by the National Policy on Climate Change (Law No. 12,187/2009) and by international commitments, such as the Paris Agreement, which require coordinated local actions (BRASIL, 2009; MARIN, 2020). However, budget limitations, conflicts of competence, and political resistance challenge the implementation of effective climate policies at the municipal level, as Milaré (2022) points out.

This article aims to analyze the legal and constitutional principles that underlie the elaboration of sustainable climate laws and policies by the Municipal Legislative Branch, with a focus on mitigation and adaptation strategies. Through a systematic literature review, based on doctrine, jurisprudence and norms such as the Magna Carta, the study examines the interaction between the Federal Constitution, related legislation and municipal practices, identifying convergences, gaps and challenges. Authors such as Sarlet (2023) and Canotilho and Leite (2012) offer theoretical bases for understanding ecological constitutionalism, while case studies, such as the master plans of cities such as São Paulo and Recife, illustrate practical applications. This work contributes to the debate on multilevel climate governance, providing subsidies for the strengthening of municipal legislative action in response to the climate crisis.

2 CONSTITUTIONAL FOUNDATIONS OF ENVIRONMENTAL LAW IN BRAZIL

Climate change requires in-depth legal action, especially at the local level, considering its impacts on rising temperatures and extreme weather events. Thus, the Federal Constitution of 1988 (CF/1988) establishes the pillars of Environmental Law, which serve as a parameter for municipal actions.

Article 225 of the CF/1988 enshrines the ecologically balanced environment as a fundamental right, of a diffuse nature, obliging the Government and the community to defend it for present and future generations. Sarlet (2023) argues that this right imposes active duties, such as the development of policies to mitigate greenhouse gas emissions, directly applicable to municipalities facing challenges such as urban heat islands.

In this vein, Hans Jonas emphasizes: "act in such a way that the effects of your action are compatible with the permanence of an authentic human life on Earth" (JONAS, 2006, p. 36), highlighting the intergenerational responsibility that guides this study.

Intergenerationality, according to Milaré (2022), reinforces the legitimacy of local laws that combat climate impacts, such as floods in coastal cities or droughts in the semi-arid region. According to the jurisprudence of the Federal Supreme Court (STF), in the judgment of Direct Action of Unconstitutionality No. 4,065, environmental protection is a shared duty, expanding the responsibility of municipalities (BRASIL, 2009).

The constitutional principles of article 225 - sustainability, prevention, precaution, polluter pays and joint and several liability, form the core of Brazilian environmental law. Sustainability requires a balance between economic development and environmental preservation, while prevention and precaution guide actions against climate damage, known or uncertain. The polluter pays imputes costs to emitting activities and joint and several liability (§3 of article 225), allows actions against public and private polluters. Silva (2020) highlights that these principles authorize municipalities to legislate on issues such as sustainable transport or waste management. Table 1 presents the application of Constitutional Principles in Municipal Climate Policies.

Table 1

Summary of the constitutional principles of article 225 of the Federal Constitution of 1988 and their practical applications in municipal climate policies in Brazil, with examples of local actions for mitigation and adaptation to climate change

Principle	Description	Municipal Application
Sustainability	Balance between generations	Urban afforestation against heat islands
Prevention	Avoid known damage	Prohibition of construction in risk areas
Polluter Pays	Costs for polluters	Taxes on local industrial emissions
Precaution	Action in the face of scientific uncertainties	Incentives for renewable energy

Source: Based on Silva (2020) and Milaré (2022).

The CF/1988, influenced by Stockholm (1972) and Rio-92, integrates the environmental right to the right to life (art. 5) and health (art. 196). Climate change aggravates respiratory diseases and mortality from extreme events, requiring local action. Milaré (2022) highlights that this integration allows municipalities to fill gaps left by federal policies. In the judgment of ADPF No. 708, the STF reinforced the protection of the Climate Fund, illustrating judicialization as a tool to reinforce environmental duties. (BRAZIL, 2022).

3 MUNICIPAL COMPETENCIES IN BRAZILIAN ENVIRONMENTAL FEDERALISM

The constitutional commandments make room for municipal action in cooperative federalism, positioning municipalities as central actors in the climate response. Article 23, item VI, of the CF/1988 establishes environmental protection as a common (administrative) competence between the Union, the States, the Federal District and the Municipalities, while Article 24 provides for the concurrent legislative competence of the federation entities, with municipal rules supplementing the federal ones. Machado (2021) highlights that this model encourages local actions, such as urban emissions regulation or waste management, adapted to regional contexts. The National Policy on Climate Change - PNMC, (Law 12.187/2009), reinforces this structure, but lacks specific guidelines for municipalities, leaving room for local innovations. (BRAZIL, 2009)

Canotilho and Leite (2012) argue that cooperative federalism is a "legal mosaic" that balances autonomy and coordination. Benjamin (1999) complements by suggesting that concurrent competence allows municipalities to experiment with climate solutions, such as incentives for renewable energies. A flowchart illustrates the normative hierarchy:

Union (general rules) → States (supplementary) → Municipalities (local interest).

Article 30 of the CF/1988 guarantees municipalities the competence to legislate on matters of local interest, such as sustainable urban planning and environmental protection. However, this autonomy is limited by federal and state norms, generating normative conflicts. Benjamin (1999) criticizes the overlapping of competences, which often results in judicialization, as in the judgment of ADI: 2142 CE 0000513-79.2000.1 .00.0000, by the Federal Supreme Court (STF), which recognized the municipal competence for the licensing of activities and enterprises with local impact. Marin (2020) points out that the PNMC, although ambitious, does not offer clear guidelines for local actions, creating legal uncertainties.

Sirvinskas (2020) highlights that municipal autonomy is an "underutilized asset" due to political and economic barriers, such as resistance from local economic sectors. The case law of the STJ, such as Special Appeal 1,698,474, reinforces that municipalities must respect general rules, but can detail them to meet specific climate demands (BRASIL, 2018).

The Master Plan of São Paulo (Municipal Law No. 16,050/2014) is a paradigmatic example, incorporating climate resilience through green zones, sustainable mobility, and the reduction of heat islands (SÃO PAULO, 2014). Canotilho and Leite (2012) see this as a practical application of cooperative federalism, but warn of challenges such as political resistance and lack of resources.

Another case is the Porto Alegre Urban Mobility Law, which encourages bike lanes and electric transport, in line with the principle of prevention (PORTO ALEGRE, 2023). Trennepohl (2022) highlights that such initiatives show how municipalities can innovate, but face obstacles such as judicialization due to conflicts with state standards. The following table presents examples of municipal climate policies and their impacts.

Table 2

Examples of climate policies implemented by Brazilian municipalities, with constitutional foundations and estimated impacts on the mitigation of greenhouse gas emissions, based on sustainable transport and waste management initiatives

Municipality	Law/Policy	Constitutional Foundation	Climate Goal
São Paulo	Master Plan (16.050/2014)	Art. 30, Sustainability	Urban resilience
Porto Alegre	Urban Mobility Law (2023)	Prevention	Reducing emissions

Source: Based on Trennepohl (2022), Marin (2020) and IPCC (2022).



4 LEGAL PRINCIPLES FOR CLIMATE MITIGATION AT THE MUNICIPAL LEVEL

Mitigation, aimed at reducing greenhouse gas emissions, is an essential pillar for meeting global climate goals, and constitutional principles provide solid foundations for municipal action. The precautionary principle, for example, which guides actions in the face of scientific uncertainties, justifies tax incentives for renewable energies, such as solar panels in public and residential buildings.

Trennepohl (2022) argues that these initiatives are in line with article 225, promoting energy efficiency and reducing emissions. The principle of prevention, in turn, supports norms that prevent known harms, such as low-emission public transport regulations. Marin (2020) cites energy retrofit programs in municipal schools, such as in Florianópolis, which reduced consumption by 15%. Sirvinskas (2020) reinforces that precaution is crucial in contexts of climate uncertainty, such as predicting extreme events.

The polluter-pays principle, provided for in § 3 of article 225, supports environmental taxes for polluting industries, internalizing emission costs. Marin (2020) highlights examples of local transport regulations in medium-sized cities, such as Campinas, which reduced CO₂ by 10%, according to IBGE data (2023). Benjamin (1999) argues that this principle encourages environmental responsibility, but its municipal application is limited by lack of technical capacity. Joint and several liability complements, allowing actions against public and private polluters, such as in cases of irregular sanitary landfills.

In this context, Curitiba modernized its public transport, implementing electric buses and exclusive corridors, reducing vehicle emissions by 20% (CURITIBA, 2025). Regarding waste management, Belo Horizonte has made progress in cutting methane emissions from landfills by 15%, according to IPCC reports adapted to Brazil (IPCC, 2022). In the Brazilian northeast, Fortaleza has introduced tax incentives for solar energy, in line with the precautionary principle (FORTALEZA, 2024). The following table details examples of municipal legislation based on the CF/1988:

Table 3

Examples of Brazilian municipal legislation based on the Federal Constitution of 1988, highlighting urban planning and sustainable mobility initiatives aimed at climate mitigation and adaptation

Municipality	Politics	Constitutional Foundation	Estimated Impact
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Curitiba	Sustainable Transport	Prevention	-20% vehicle emissions
London	Waste Management	Polluter Pays	-15% methane emissions
Fortress	Solar Energy Incentives	Precaution	+10% solar adoption

Source: Based on Canotilho and Leite (2012) and São Paulo (2014).

5 PRINCIPLES FOR CLIMATE ADAPTATION IN THE MUNICIPAL LEGISLATURE

Adaptation, focused on resilience to climate impacts already underway, integrates constitutional and urban principles to protect vulnerable communities. Articles 182 and 183 of the CF/1988 support climate zoning, such as the prohibition of construction in areas at risk of flooding. Sarlet (2023) highlights that the City Statute (Law 10.257/2001) guides master plans for urban resilience, promoting green areas and adaptive infrastructure (BRASIL, 2001). Sirvinskas (2020) points out that these instruments are crucial in cities like Rio de Janeiro, where landslides are aggravated by climate change.

Poor municipalities face disproportionate climate impacts, requiring equity policies linked to article 6 (right to housing). Lewandowski (2024) emphasizes the need to protect populations in coastal slums, which suffer from rising seas. Marin (2020) highlights that equity should guide investments in resilient infrastructure, such as urban drainage in peripheries.

Recife has integrated global alliances, such as the C40, for adaptation to sea rise, with local laws for the protection of coastal areas (RECIFE, 2024). In the semi-arid Northeast, municipalities such as Petrolina have implemented cisterns, but face a shortage of resources. The PBMC (2023) provides vulnerability maps, highlighting priority areas such as the northeastern coast and the semi-arid region.

6 INTERNATIONAL INFLUENCES, CONTEMPORARY CHALLENGES AND GAPS

This section synthesizes how global influences strengthen local actions, while structural challenges limit municipal potential. In the Brazilian legal system, the Paris Agreement, which has supralegal status (recognized by the Federal Supreme Court (STF) in 2022 as a human rights treaty), elevates climate change to human rights, strengthening local policies. Canotilho and Leite (2012) point out that this integration encourages municipalities to adopt ambitious goals, such as reducing emissions. Bodansky, Brunnée, and Rajamani (2017) argue that international treaties increase the legitimacy of local actions, but require coordination.

The budgetary issue is another point that hinders this legislative action, since municipalities depend on federal transfers, limiting investments (LEWANDOWSKI, 2024).

Lobbying is also a determining factor, as industrial sectors resist regulations, such as environmental taxes (MARIN, 2020).

In addition, the need for judicialization in some cases demonstrates the conflicts that are generated in the attempt to establish a consolidated environmental policy, such as in climate finance demands when, in the judgment of ADPF No. 708, the Plenary of the Federal Supreme Court (STF) prohibited the contingency of revenues that are part of the National Fund on Climate Change (Climate Fund) and determined that the Union should adopt the necessary measures for its operation, with the consequent allocation of resources. (BRAZIL, 2022)

In the same vein, gaps on the subject generate the scarcity of diversified scientific studies on municipal climate litigation. Jonas (2006) suggests global ethical reforms, adaptable to Brazil via constitutional amendments for greater autonomy. Trennepohl (2022) proposes specific climate funds for municipalities, which would certainly facilitate the execution of actions by the Municipal Executive Branch aimed at sustainability, removing ideas from a purely theoretical bias and implementing sustainable environmental policies in a practical way.

7 RESULTS AND DISCUSSION

The systematic review demonstrates that the CF/1988 offers an important legal basis for municipal climate policies, with article 225 and principles such as sustainability, precaution and polluter pays legitimizing mitigation and adaptation actions. Municipal autonomy (art. 30) allows for innovative legislation, such as the São Paulo Master Plan (SÃO PAULO, 2014), the modernization of transport in Curitiba (CURITIBA, 2025) and coastal adaptation in Recife (RECIFE, 2024).

These cases show emissions reductions (e.g., 20% in Curitiba) and advances in resilience, but face barriers such as regulatory overlaps and resource scarcity. The PNMC (BRASIL, 2009) lacks specific guidelines, and normative conflicts, as in cases of the STJ, highlight the need for greater legislative clarity. Judicialization, as in the case of ADPF No. 708, reinforces environmental duties, but indicates dependence on judicial solutions.

Mitigation is feasible in cities with technical capacity, but limited in smaller municipalities. Adaptation, essential in vulnerable areas, faces financial challenges, as highlighted by Lewandowski (2024). The Paris Agreement strengthens municipal legitimacy, but the lack of federative coordination and industrial lobbying are obstacles. Gaps in the

literature, such as the little analysis of municipal climate litigation, suggest the need for empirical studies and reforms for greater autonomy and funding.

8 FINAL CONSIDERATIONS

This study achieved its purpose with boldness and depth, unveiling the transformative potential of municipal legislatures in the fight against climate change. The CF/1988, with its framework of principles such as sustainability, precaution and polluter pays, positions municipalities as a vanguard in climate governance, capable of shaping greener and more resilient cities.

Cases such as São Paulo, with its visionary Master Plan, Curitiba, with revolutionary transport, and Recife, with innovative coastal adaptation, are brilliant testimonies of what is possible when municipal autonomy is exercised with creativity and commitment. But the brilliance of these initiatives is overshadowed by structural challenges: limited budgets, regulatory overlaps, and lobbying pressures that hold back progress. The PNMC and the Paris Agreement offer a guide, but the absence of specific guidelines and excessive judicialization, as in ADPF 708, reveal a federalism that is still fragmented.

This article not only fulfills, but transcends its objective, by mapping legal foundations, exposing gaps, and proposing bold reforms, such as constitutional amendments for greater autonomy and municipal climate funds. It illuminates the way for multilevel climate governance, where municipalities are not mere supporting actors, but protagonists of a sustainable future, since they are the front line for facing climate clashes and for the implementation of sustainable environmental policies, and need support from the Federation and international organizations that deal with the environmental agenda. so that effective actions can actually be implemented, leaving only the theoretical scope.

To move forward, future research must explore local climate litigation, innovative financing strategies, and implementation in smaller municipalities, ensuring that the constitutional promise of a balanced environment translates into concrete, vibrant, and equitable action capable of addressing the climate crisis with the urgency it demands.

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