OPEN SCIENCE REVIEW21
ISSN 3086-4089
v.1, n.1 (2026)

MUNICIPAL POLICIES FOR CLIMATE CHANGE ADAPTATION AND ORGANIC SOLID WASTE MANAGEMENT: ANALYSIS OF THE INTERMUNICIPAL CONSORTIUM OF JUNDIAÍ AND SURROUNDING MUNICIPALITIES

POLÍTICAS MUNICIPAIS DE ADAPTAÇÃO ÀS MUDANÇAS CLIMÁTICAS E A GESTÃO DE RESÍDUOS SÓLIDOS ORGÂNICOS: ANÁLISE DO CONSÓRCIO INTERMUNICIPAL DE JUNDIAÍ E MUNICÍPIOS DO ENTORNO

POLÍTICAS MUNICIPALES DE ADAPTACIÓN AL CAMBIO CLIMÁTICO Y LA GESTIÓN DE RESIDUOS SÓLIDOS ORGÁNICOS: ANÁLISIS DEL CONSORCIO INTERMUNICIPAL DE JUNDIAÍ Y MUNICIPIOS DEL ENTORNO

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e112
https://doi.org/10.66649/v8t4j502
PUBLISHED: 03/2026

ABSTRACT

Solid organic waste management constitutes one of the main environmental challenges faced by municipalities, especially in light of the need to mitigate greenhouse gas emissions and to implement public policies aligned with national and international climate guidelines. This articleaims to analyze the relationship between municipal climate change adaptation policies and the management of organic waste in six municipalities in the interior of the state of São Paulo that share the Jundiaí sanitary landfill. The research adopts a qualitative approach, with an exploratory and applied nature, and is based on a literature review, document analysis, and the interpretation of public policies and municipal plans. The results indicate that, although there have been advances in selective waste collection and in the proper final disposal of waste, significant gaps still remain in the reuse of the organic fraction, particularly with regard to composting and energy recovery. It is concluded that strengthening intermunicipal governance, combined with the expansion of integrated policies and educational actions, is essential for reducing emissions and promoting more sustainable management models.

KEYWORDS*: Organic waste. Public policies. Climate change. Municipal management. Sustainability.*

RESUMO

O gerenciamento de resíduos sólidos orgânicos constitui um dos principais desafios ambientais enfrentados pelos municípios, especialmente diante da necessidade de mitigação das emissões de gases de efeito estufa e da implementação de políticas públicas alinhadas às diretrizes climáticas nacionais e internacionais. Este artigo tem como objetivo analisar a relação entre as políticas municipais de adaptação às mudanças climáticas e a gestão de resíduos orgânicos em seis municípios do interior do estado de São Paulo que compartilham o aterro sanitário de Jundiaí. A pesquisa possui abordagem qualitativa, caráter exploratório e natureza aplicada, fundamentando-se em revisão bibliográfica, análise documental e interpretação de políticas públicas e planos municipais. Os resultados indicam que, embora haja avanços na coleta seletiva e na disposição final adequada dos resíduos, ainda existem lacunas significativas no reaproveitamento da fração orgânica, especialmente no que se refere à compostagem e à valorização energética. Conclui-se que o fortalecimento da governança intermunicipal, aliado à ampliação de políticas integradas e ações educativas, é fundamental para a redução das emissões e para a promoção de modelos de gestão mais sustentáveis.

PALAVRAS-CHAVE: Resíduos orgânicos. Políticas públicas. Mudanças climáticas. Gestão municipal. Sustentabilidade

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RESUMEN
La gestión de residuos sólidos orgánicos constituye uno de los principales desafíos ambientales que enfrentan los municipios, especialmente ante la necesidad de mitigar las emisiones de gases de efecto invernadero y de implementar políticas públicas alineadas con las directrices climáticas nacionales e internacionales. Este artículo tiene como objetivo analizar la relación entre las políticas municipales de adaptación al cambio climático y la gestión de residuos orgánicos en seis municipios del interior del estado de São Paulo que comparten el relleno sanitario de Jundiaí. La investigación adopta un enfoque cualitativo, de carácter exploratorio y naturaleza aplicada, fundamentándose en revisión bibliográfica, análisis documental e interpretación de políticas públicas y planes municipales. Los resultados indican que, aunque existen avances en la recolección selectiva y en la disposición final adecuada de los residuos, aún persisten vacíos significativos en el aprovechamiento de la fracción orgánica, especialmente en lo que respecta al compostaje y a la valorización energética. Se concluye que el fortalecimiento de la gobernanza intermunicipal, junto con la ampliación de políticas integradas y acciones educativas, es fundamental para la reducción de emisiones y para la promoción de modelos de gestión más sostenibles.

PALABRAS CLAVE*: Residuos orgánicos. Políticas públicas. Cambio climático. Gestión municipal. Sostenibilidad.*

1. INTRODUCTION

The accelerated pace of urbanization and the intensification of consumption over recent decades have significantly increased the generation of municipal solid waste, making its management one of the major contemporary environmental challenges. Among the different waste streams, the organic fraction is particularly relevant because of its considerable volume and its direct contribution to greenhouse gas emissions, especially when disposed of in landfills or open dumps.

In Brazil, the implementation of the National Solid Waste Policy represented an important regulatory milestone by establishing guidelines for integrated waste management and the reduction of environmental impacts. However, the effectiveness of these policies depends on the capacity of municipalities to coordinate their actions and integrate them with climate change adaptation strategies.

Against this background, this article aims to analyze how municipal climate adaptation policies interact with the management of organic waste within the intermunicipal consortium formed by Jundiaí, Várzea Paulista, Campo Limpo Paulista, Cajamar, Louveira, and Vinhedo. The synthesis presented here is based on a master's dissertation that examined the subject in greater depth.

2. THEORETICAL FRAMEWORK

Solid waste management is directly associated with the socioeconomic transformations resulting from urbanization and industrial development. The increase in waste generation, combined with inadequate infrastructure and insufficient urban planning, intensifies environmental and public health problems, particularly in developing countries.

Organic waste accounts for the largest share of municipal solid waste and has considerable potential for recovery through composting and energy generation. However, the lack of specific policies and economic incentives continues to limit the large-scale implementation of these practices.

At the same time, the debate on climate change has introduced new challenges for urban management, requiring municipalities to incorporate mitigation and adaptation strategies into their

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development plans. In this context, integrated waste management has emerged as an important instrument for reducing emissions and promoting urban sustainability.

3. METODOLOGY

This study adopts a qualitative, applied, and exploratory research design aimed at understanding the relationship between municipal climate change adaptation policies and the management of organic solid waste in the municipalities analyzed. The choice of this approach is justified by the need to interpret complex socio-environmental phenomena involving multiple stakeholders, institutional dimensions, and specific territorial contexts, which cannot be fully understood through quantitative methods alone.

The study was conducted through a systematized literature review covering national and international scientific publications on solid waste management, environmental public policies, climate change, and urban governance. In parallel, a documentary analysis was carried out using legislation, municipal integrated solid waste management plans, basic sanitation plans, institutional reports, and other regulatory instruments that guide public environmental policies. This stage made it possible to identify the legal and institutional framework underpinning climate adaptation and waste management strategies in the municipalities investigated.

The methodological procedure was organized into three complementary stages. The first involved collecting and systematizing information on municipal waste management systems, including waste generation, collection, treatment, and final disposal, as well as the characterization of initiatives aimed at recovering the organic fraction. The second stage consisted of a comparative analysis of local public policies to identify convergences, gaps, and levels of integration between environmental strategies and urban planning instruments. The third stage focused on identifying challenges, strengths, and opportunities for improving the policies under analysis, taking technical, institutional, and socioeconomic aspects into consideration.

Data interpretation was conducted through qualitative content analysis, which enabled the information to be organized into analytical categories related to environmental governance, waste management efficiency, and alignment with climate mitigation and adaptation targets. This approach made it possible to assess not only the existence of policies and programs, but also their effectiveness and degree of interinstitutional coordination.

The methodological strategy adopted therefore provided an integrated understanding of the phenomenon under investigation by considering its institutional, operational, and socio-environmental dimensions. It also contributed to the development of a critical analysis of the role of organic waste management within the context of municipal policies aimed at addressing climate change.

4. RESULTS AND DISCUSSION

The results indicate that the municipalities analyzed have achieved relatively high levels of coverage in municipal solid waste collection and environmentally appropriate final disposal services. This performance is directly associated with investments in infrastructure, improvements in operational

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systems, and the adoption of intermunicipal management arrangements. The availability of a shared sanitary landfill and administrative structures dedicated to urban cleaning services contributes to greater service efficiency and helps reduce inappropriate waste disposal practices.

Despite these structural advances, however, the analysis showed that the organic fraction of municipal waste is still predominantly sent to landfills, while composting, anaerobic digestion, and other forms of organic waste recovery remain limited. This situation demonstrates that municipal waste management continues to focus primarily on the final stage of the waste cycle, prioritizing appropriate disposal without fully exploring the potential for material recovery and for reducing the emissions associated with the biological treatment of organic waste.

The absence of more robust policies aimed at promoting the circular economy and recovering organic matter reveals a gap between environmental planning and operational practice. Although the municipalities have established guidelines and targets related to sustainability and climate change, these initiatives do not always translate into effective programs because of technical, financial, or institutional constraints. In this regard, the integration of climate planning and waste management remains a significant challenge for local public authorities.

Another relevant finding concerns the importance of intermunicipal cooperation as a strategy for optimizing resources, sharing infrastructure, and strengthening institutional capacity. The consortium-based model generates economies of scale, reduces costs, and promotes the standardization of procedures, making it a viable alternative, particularly for medium-sized municipalities. Nevertheless, challenges remain regarding governance, the allocation of responsibilities, the financial sustainability of services, and public engagement, which is essential to the success of waste reduction and recovery policies.

Overall, the results suggest that, although the waste management system has made significant progress at the operational level, further development is still required at the strategic level, particularly regarding the adoption of innovative practices and planning instruments capable of integrating the solid waste and climate change agendas.

5. FINAL CONSIDERATIONS

This study demonstrates that organic waste management plays a central role in municipal climate agendas, as its appropriate treatment can contribute significantly to reducing greenhouse gas emissions, alleviating pressure on sanitary landfills, and strengthening more sustainable urban development models. The analysis showed that, despite important advances in waste collection and final disposal, the recovery potential of the organic fraction remains largely underused. This finding indicates the need to redirect public policies beyond a model centered primarily on final disposal.

It may therefore be concluded that the consolidation of integrated policies combining environmental planning, waste management, and climate adaptation strategies is essential to improving municipal systems. Strengthening intermunicipal consortia, expanding composting and waste-to-energy

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programs, and investing in environmental education and technological innovation represent promising pathways for increasing management efficiency and reducing environmental impacts.

Furthermore, the development of more sustainable management models depends not only on technical and regulatory instruments, but also on participatory governance processes capable of engaging public authorities, the productive sector, and civil society. In this way, organic waste management can move beyond being treated solely as an operational problem and become a strategic opportunity for sustainable urban development, aligned with global environmental targets and the principles of the circular economy.

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