

Urban soil and agroecology as pillars for the metropolis of the future: socio-environmental challenges and prospects for sustainable cities

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Solo urbano e agroecologia como eixos para a metrópole do futuro: desafios socioambientais e perspectivas para cidades sustentáveis

RESUMO

Objetivo – Analisar o território baiano a partir do solo urbano, elemento frequentemente invisibilizado no planejamento urbano, argumentando que sua compreensão como território vivo é estratégica para a sustentabilidade e a justiça ambiental.

Metodologia – Estudo teórico interdisciplinar articulando Geografia, Ciência do Solo e Agroecologia, estruturado em três eixos: desafios socioambientais urbanos, vulnerabilidades socioespaciais da urbanização neoliberal e perspectivas projetuais para resiliência e planejamento urbano sustentável.

Originalidade/relevância – O trabalho preenche um gap teórico ao destacar o solo urbano como objeto central de análise no contexto da crise climática e do planejamento urbano. Sua relevância acadêmica reside na proposição de uma agenda interdisciplinar que articula sustentabilidade, resiliência e justiça ambiental.

Resultados – Evidencia-se que a impermeabilização excessiva, a ocupação irregular de encostas e a degradação de áreas verdes ampliam enchentes, deslizamentos e ilhas de calor, reforçando vulnerabilidades sociais e ambientais. O estudo também identifica práticas de planejamento urbano que podem fortalecer a resiliência socioambiental.

Contribuições teóricas/metodológicas – Integra conceitos de solo, urbanismo e agroecologia, oferecendo base analítica para estudos futuros sobre cidades sustentáveis.

Contribuições sociais e ambientais – Destaca a importância da valorização do solo e da agroecologia como pilares para metrópoles mais inclusivas, sustentáveis e ambientalmente justas, promovendo estratégias que reduzem riscos socioambientais e fortalecem o direito à cidade.

PALAVRAS-CHAVE: Solo urbano; Resiliência socioambiental; Agroecologia urbana.

Urban soil and agroecology as pillars for the metropolis of the future: socio-environmental challenges and perspectives for sustainable cities

ABSTRACT

Objective – To analyze the territory of Bahia from the perspective of urban soil, an element often overlooked in urban planning, arguing that understanding it as a living territory is strategic for sustainability and environmental justice.

Methodology – An interdisciplinary theoretical study combining geography, soil science, and agroecology, structured around three axes: urban socio-environmental challenges, socio-spatial vulnerabilities of neoliberal urbanization, and design perspectives for resilience and sustainable urban planning.

Originality/relevance – The work fills a theoretical gap by highlighting urban soil as a central object of analysis in the context of the climate crisis and urban planning. Its academic relevance lies in proposing an interdisciplinary agenda that combines sustainability, resilience, and environmental justice.

Results – It is evident that excessive waterproofing, irregular occupation of slopes, and degradation of green areas increase flooding, landslides, and heat islands, reinforcing social and environmental vulnerabilities. The study also identifies urban planning practices that can strengthen socio-environmental resilience.

Theoretical/methodological contributions – Integrates concepts of soil, urbanism, and agroecology, providing an analytical basis for future studies on sustainable cities.

Social and environmental contributions – Highlights the importance of valuing soil and agroecology as pillars for more inclusive, sustainable, and environmentally just metropolises, promoting strategies that reduce socio-environmental risks and strengthen the right to the city.

KEYWORDS: Urban soil; Socio-environmental resilience; Urban agroecology.

El suelo urbano y la agroecología como pilares de la metrópolis del futuro: retos socioambientales y perspectivas para ciudades sostenibles

RESUMEN

Objetivo: Analizar el territorio bahiano a partir del suelo urbano, un elemento que a menudo se ignora en la planificación urbana, argumentando que su comprensión como territorio vivo es estratégica para la sostenibilidad y la justicia ambiental.

Metodología: Estudio teórico interdisciplinario que articula la geografía, la ciencia del suelo y la agroecología, estructurado en tres ejes: retos socioambientales urbanos, vulnerabilidades socioespaciales de la urbanización neoliberal y perspectivas de diseño para la resiliencia y la planificación urbana sostenible.

Originalidad/relevancia: El trabajo llena un vacío teórico al destacar el suelo urbano como objeto central de análisis en el contexto de la crisis climática y la planificación urbana. Su relevancia académica reside en la propuesta de una agenda interdisciplinaria que articula la sostenibilidad, la resiliencia y la justicia ambiental.

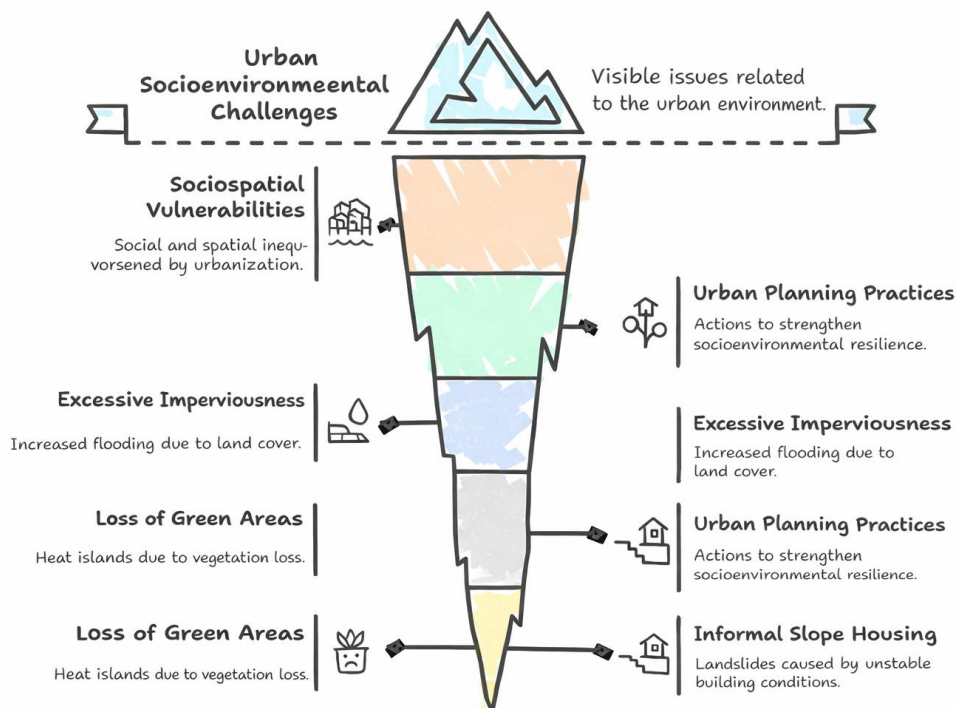
Resultados: Se evidencia que la impermeabilización excesiva, la ocupación irregular de laderas y la degradación de áreas verdes aumentan las inundaciones, los deslizamientos y las islas de calor, lo que refuerza las vulnerabilidades sociales y ambientales. El estudio también identifica prácticas de planificación urbana que pueden fortalecer la resiliencia socioambiental.

Contribuciones teóricas/metodológicas: Integra conceptos de suelo, urbanismo y agroecología, ofreciendo una base analítica para futuros estudios sobre ciudades sostenibles.

Contribuciones sociales y medioambientales: Destaca la importancia de la valorización del suelo y la agroecología como pilares para metrópolis más inclusivas, sostenibles y ambientalmente justas, promoviendo estrategias que reducen los riesgos socioambientales y fortalecen el derecho a la ciudad.

PALABRAS CLAVE: Suelo urbano; Resiliencia socioambiental; Agroecología urbana.

GRAPHIC SUMMARY



1 INTRODUCTION

Contemporary cities face intense transformations due to the economic, social, and environmental dynamics that shape the 21st century. In the Brazilian context, the urbanization process has been characterized by uneven expansion and the reproduction of historical socio-spatial exclusions, a phenomenon that is accentuated in the metropolises of the Northeast, such as Salvador. The neoliberal logic of urban space production, characterized by the financialization of land, privatization of services, and socio-spatial segregation, generates territories marked by multiple vulnerabilities, mainly affecting peripheral communities and historically marginalized populations (Dragan et al., 2024).

In this context, urban soil analysis plays a central role in understanding the socio-environmental dynamics of cities. Often overlooked in urban planning, soil is a strategic element for urban sustainability, since its degradation compromises water regulation, intensifies vulnerability to natural disasters, and reduces the ecological resilience of urban areas (Godoy; Benini, 2024; Oliveira et al., 2025; Porto-Gonçalves, 2006). In Salvador, the disorderly occupation of hillsides, swampy areas, and peripheral regions without adequate planning highlights how soil degradation is directly related to socio-environmental vulnerability, affecting the safety of communities and the city's ability to respond to extreme events.

Within this context, urban agroecology emerges as an approach capable of integrating socio-environmental justice, sustainability, and social inclusion, offering concrete alternatives for the reappropriation of marginalized territories. Practices such as community gardens, productive backyards, and urban composting systems promote the regeneration of degraded soils, strengthen local ecological resilience, and ensure food security, articulating the principles of environmental sustainability with community participation (Altieri, 2012; Gliessman, 2025). By transforming neglected urban spaces into productive areas that promote environmental care, these initiatives reveal the potential of soil as a living and strategic resource for sustainable urban planning.

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In Salvador, experiences in neighborhoods such as Cajazeiras, Subúrbio Ferroviário, and Liberdade exemplify the transformative nature of urban agroecology, functioning simultaneously as strategies for resisting neoliberal logic and valuing urban soil (Santana, Farias; 2021). By articulating ecological practices, social inclusion, and community engagement, these initiatives demonstrate that urban sustainability is not limited to infrastructure or the economy, but depends deeply on the recognition of soil as a central element in the construction of resilient, equitable, and environmentally just cities.

Understanding the socio-environmental challenges of contemporary metropolises requires interdisciplinary dialogue between critical urban geography, soil science, and agroecology. The concept of the neoliberal city, widely discussed by Trindade and Amusquivar (2025), refers to an urban model in which the production of space is subordinated to the logic of capital, the financialization of land, and the commodification of urban services. In this context, urbanization produces socio-spatial inequalities, concentrating investments in valued areas while increasing precariousness in peripheral territories, generating exclusion, vulnerability, and historical segregation (Giglioli, 2021; Clerici; Ricotta, 2025).

In Salvador, Brazil, this dynamic manifests itself in the coexistence of tourist and commercial enclaves with peripheral neighborhoods, irregular occupations on hillsides and flood areas, such as Cajazeiras, Subúrbio Ferroviário, and Liberdade (Santana; Farias, 2021). In these areas, urban vulnerability is not limited to a lack of infrastructure, but is exacerbated by soil degradation and the absence of integrated territorial planning. Castro (2023) emphasizes that socio-environmental vulnerability results from the interaction between social inequalities and environmental risks, being distributed unevenly across the city and mainly affecting black and low-income communities.

Urban soil, often overlooked in public policy, plays a central role in this vulnerability. Porto-Gonçalves (2006) emphasizes that soil should be understood as living territory, essential for water regulation, infiltration, and the ecological resilience of cities. Increasing impermeability, hillside occupation, and the degradation of green areas intensify extreme events such as floods and landslides, directly impacting the quality of life of peripheral populations.

In this context, urban agroecology emerges as a transformative strategy, articulating socio-environmental justice, food security, and urban soil recovery. Altieri (2012) and Gliessman (2025) highlight that community gardens, productive backyards, and urban composting strengthen local resilience, promote biodiversity, and encourage community participation. In Salvador, experiences in peripheral neighborhoods show that agroecology not only guarantees access to healthy food, but also constitutes practices of resistance to neoliberal logic, reappropriating excluded territories and valuing soil as a strategic resource (Santana; Delaporte; 2022).

Furthermore, urban agroecology directly dialogues with the concept of the right to the city (Altieri, 2012), by claiming that access to the city should not be restricted to material goods, but should include active participation, sustainability, and socio-environmental justice. In this sense, the integration of agroecological practices with urban public policies can represent innovative paths for the construction of resilient, environmentally balanced, and socially inclusive metropolises, reinforcing the idea that excluded territories can become arenas for transformation and the production of life.

Finally, the theoretical debate shows that addressing the challenges of future metropolises requires a holistic approach capable of articulating social inequality (Carvalho et al., 2021), environmental vulnerability, and urban soil management. By combining contributions from critical geography, soil science, and agroecology, it is possible to propose design solutions that integrate urban sustainability, socio-environmental justice, and social innovation, contributing to the planning of more resilient and equitable cities capable of addressing climate

and urban crises in a systemic manner.

This article proposes to analyze the metropolis of Bahia from the intersection between critical geography, soil science, and agroecology, seeking to understand: (i) how neoliberal logic intensifies socio-environmental vulnerabilities; (ii) how urban soil degradation contributes to risks and inequalities; and (iii) how urban and peri-urban agroecological practices can offer design perspectives for the construction of sustainable, resilient, and socially just metropolises. By placing soil as a living territory and agroecology as a strategy for transformation, the study contributes to the discussion about the metropolis of the future and the challenges of integrating sustainability, environmental justice, and inclusive urban planning.

2 METHODOLOGY

This study adopts a qualitative and critical approach, articulating concepts of Urban Geography, Soil Science, and Agroecology, with the aim of understanding the socio-environmental challenges of Brazilian metropolises based on Salvador as a case study (Altieri, 2012; Silva, Brasileiro, 2022). The methodology was structured in three main stages, seeking to integrate theoretical analysis, socio-environmental mapping, and evaluation of innovative urban sustainability practices.

The first stage consisted of a bibliographic and documentary review, in which academic works, reports from public agencies such as IBGE (Brazilian Institute of Geography and Statistics, 2023), institutional data provided by SEDUR (Municipal Secretariat for Urban Development) and CONDER (Urban Development Company of the State of Bahia, 2026), as well as municipal master plans (Bahia, 2026; Porto-Gonçalves, 2006). The objective was to map the production of neoliberal urban space, identify areas of socio-environmental vulnerability, and survey experiences of urban agroecology in Bahia, building a theoretical and empirical basis for understanding the relationships between urban occupation, soil degradation, and territorial inequality.

The second stage involved socio-spatial and environmental analysis, using secondary data on land use, hillside occupation, risk areas, flooding, and urban infrastructure. Social and environmental vulnerability indicators were cross-referenced with urban occupation maps, allowing the identification of excluded territories and critical areas of the city (Souza et al., 2024). This approach enabled the articulation between physical soil factors and socioeconomic dynamics, highlighting the urban spaces most susceptible to natural and socio-environmental risks (Dragan et al., 2024).

The third stage consisted of studying urban agroecological experiences, including community gardens, productive backyards, and composting systems in peripheral neighborhoods of Salvador, such as Cajazeiras, Liberdade, and Subúrbio Ferroviário. The analysis was based on documentary records, interviews with community leaders, and data from urban agroecology organizations, such as the Teia dos Povos Seed Network (Ribeiro, Ferreira; 2024). The approach was inspired by participatory action research, recognizing knowledge as a collective construction between researchers and the community (Fals Borda, 1987; Gliessman, 2025).

This methodology allows for the integration of a critical analysis of the neoliberal city,

the assessment of urban soil vulnerability, and the identification of agroecological practices as mitigation and resilience strategies. In this way, it provides support for project proposals for sustainable cities, capable of reconciling urban planning, socio-environmental justice, and responsible management of natural resources (Altieri, 2012; Porto-Gonçalves, 2006).

3 RESULTS AND DISCUSSION

3.1 Excluded territories and neoliberal urban production

The socio-spatial mapping of cities in Bahia reveals persistent patterns of urban segregation and territorial inequality, highlighting how the distribution of infrastructure, investments, and urban services reflects deep historical and socioeconomic divisions. In Salvador, high-value areas, including the Atlantic coastline and major commercial centers, concentrate public and private resources, quality infrastructure, and access to essential services, while peripheral neighborhoods and urban hillsides, such as Cajazeiras, Liberdade, and Subúrbio Ferroviário, suffer from precarious housing, a lack of urban services, and high exposure to socio-environmental risks, including landslides, erosion, and water vulnerability (Santana; Farias, 2021).

The pattern of territorial inequality observed in Salvador extends consistently to medium-sized cities in Bahia, such as Feira de Santana and Vitória da Conquista, where irregular urban expansion has reproduced similar mechanisms of socio-spatial segregation. In these locations, areas of high vulnerability are often occupied by peripheral populations, reflecting both demographic pressure and the lack of effective land use planning policies. This dynamic highlights how the unequal distribution of urban resources and infrastructure is consolidated over time, maintaining cycles of spatial and socioeconomic marginalization.

The occupation of these areas is marked by fragile soils, unstable terrain, and regions prone to flooding, conditions that significantly increase environmental risks. The interaction between biophysical factors and irregular human occupation creates a scenario of high socio-environmental vulnerability, in which landslides, erosion, and flooding become recurrent, directly affecting the safety and quality of life of communities (Castro, 2023). Analysis of these conditions shows that urban segregation is not only the result of economic inequalities, but also of physical limitations of the territory and the lack of integrated urban planning (Souza et al., 2025).

These findings reinforce the need for coordinated public policies that simultaneously consider risk management, land use, and socio-environmental justice. Sustainable urbanization strategies must incorporate the assessment of the biophysical characteristics of the territory, the implementation of adequate infrastructure, and the mitigation of natural risks, in order to reduce vulnerabilities and promote the safe and equitable occupation of peripheral urban areas. Such measures are essential to break the cycle of segregation and build more resilient and inclusive cities capable of responding to the challenges posed by climate change and rapid population growth.

Given these dynamics, it is clear that promoting more equitable and resilient cities requires integrated public policies capable of articulating risk management, urban planning, and

socio-environmental justice. Considering the interaction between the biophysical characteristics of the soil, the relief, and human occupation is crucial to reducing inequalities, mitigating risks, and promoting a sustainable urbanization process in tropical contexts, ensuring safety, well-being, and environmental quality for the most vulnerable populations.

3.2 Urban soil and socio-environmental vulnerability

Urban soil degradation in Salvador manifests itself in various ways, reflecting the intensification of disorderly urbanization processes and pressure on natural resources. Extensive soil sealing, resulting from the replacement of permeable surfaces with asphalt, concrete, and buildings, compromises rainwater infiltration, increasing surface runoff and flooding in urban areas. Data from the Brazilian Institute of Geography and Statistics (IBGE) indicate that, in 2010, approximately 45% of the population of Salvador lived in areas with a potential risk of flooding and landslides, highlighting the direct relationship between soil sealing and socio-environmental vulnerability (Castro, 2023; IBGE, 2023).

Erosion on urban slopes is another significant phenomenon, exacerbated by the removal of native vegetation and disorderly occupation. Construction in risk areas, such as slopes and urban river valleys, contributes to landslides, compromising the safety of vulnerable populations. The Urban Development Master Plan (Bahia, 2016) for Salvador highlights the need to control land occupation and preserve risk areas in order to mitigate the impacts of erosion and landslides.

Water contamination is also a growing concern, resulting from the improper disposal of domestic sewage and solid waste in water bodies. This practice compromises water quality, posing risks to public health and aquatic biodiversity. CONDER and SEDUR (Bahia, 2016) have developed and implemented initiatives aimed at expanding and modernizing basic sanitation infrastructure, with an emphasis on sewage collection and treatment, proper stormwater management, and the reduction of diffuse and point sources of water pollution. These actions seek to mitigate the environmental impacts of rapid urbanization and contribute to improving public health conditions and the quality of life of urban populations.

However, significant obstacles remain in peripheral areas, informal settlements, and regions with rugged topography or difficult access, where the implementation of sanitation works faces technical, financial, and social limitations (Nascimento; Freire, 2006). These contexts reveal the need for integrated strategies that combine public policies, community participation, and appropriate social technologies to ensure the effective universalization of sanitation services and the reduction of pollution discharged into water bodies.

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The loss of green areas in Salvador reduces the capacity for climate regulation and carbon retention, contributing to an increase in urban heat islands and a reduction in

biodiversity. The Environmental Atlas for Children and Youth of Salvador, produced by the Education Department of the Municipal Environment Superintendency (SMA), highlights the importance of green areas for urban quality of life and the need for their preservation in the face of uncontrolled urban expansion (Nascimento; Freire, 2006). These processes of urban soil degradation highlight the urgent need for integrated public policies that take into account the environmental and social specificities of Salvador. The implementation of sustainable urban planning strategies (Souza et al., 2025), which include the recovery of degraded areas, the promotion of soil permeability, and the expansion of sanitation infrastructure, is essential to mitigate the impacts of urbanization and promote the city's socio-environmental resilience.

Still in relation to disorderly occupation in peripheral regions, Castro (2023) points to significant contributions to urban vulnerability, increasing the risks associated with extreme weather events such as floods and landslides. The absence of territorial planning, combined with rapid and unregulated population growth, results in the occupation of ecologically fragile areas, often with soils that are not very resistant to erosion and unstable terrain, which compromises the physical stability of these regions and the safety of the resident communities.

In medium-sized cities in Bahia, such as Feira de Santana and Vitória da Conquista, irregular urban expansion has led to the occupation of vulnerable soils and areas susceptible to flooding, reflecting both demographic pressure and the lack of land use planning policies. In these locations, the combination of unstable terrain, fragile soils, and high population density intensifies the exposure of peripheral populations to socio-environmental risks, highlighting the urgent need for integration between risk management and sustainable urban planning.

The situation is aggravated by the lack of adequate infrastructure, including insufficient drainage systems, lack of basic sanitation, and lack of essential public services (Corrêa et al., 2026; Oliveira et al., 2025). Construction in risk areas without appropriate mitigation measures increases communities' susceptibility to the impacts of climate change, such as more frequent and prolonged heavy rainfall events. This context highlights that urban vulnerability is multidimensional, involving social, economic, and environmental factors, and reinforces the importance of public policies that articulate urban resilience, environmental management, and social justice in peripheral urban regions.

These phenomena show that urban vulnerability is not only social, but also edaphic and environmental. The interaction between physical factors of the soil, such as its composition and drainage capacity, and social factors, such as irregular occupation and lack of infrastructure, compromises the resilience of cities (Corrêa et al., 2026). To mitigate these impacts, it is essential to implement integrated public policies that consider both environmental characteristics and social needs, promoting sustainable and inclusive urban development. The adoption of practices such as participatory urban planning, the recovery of degraded areas, and the promotion of nature-based solutions are fundamental to building more resilient and equitable cities (Souza et al., 2025).

3.3 Urban agroecology as a resilience strategy

Urban agroecology initiatives are instruments of socio-environmental transformation in peripheral areas, particularly in historically vulnerable areas of Salvador, such as Cajazeiras

and Subúrbio Ferroviário. Community garden projects, productive backyards, and collective composting systems have contributed to the recovery of degraded areas, increased availability of fresh and healthy food, and reduced dependence on conventional supply chains (Jesus et al., 2025; Tarrão et al., 2024).

In addition to promoting environmental and nutritional benefits, these initiatives foster collective learning processes, the appreciation of traditional knowledge, and the consolidation of local cooperation and self-management networks, strengthening the organizational capacity of communities. In this sense, urban agroecology emerges as a practice of resistance to the neoliberal model of the city, marked by the commodification of space and the prevalence of private interests over collective well-being. By revaluing urban soil as a living resource and promoting socio-environmental justice, such experiences point to the construction of more inclusive, resilient, and sustainable cities.

From an environmental perspective, such practices promote the revaluation of urban soil as a living resource, improving fertility, water retention, and local biodiversity. By integrating sustainable management techniques, composting, and polyculture, urban agroecology contributes to the restoration of degraded microecosystems and the mitigation of urban problems such as erosion and excessive impermeability. In this way, soil ceases to be merely a physical support for construction and becomes a central element in ecological regeneration and urban resilience.

In addition to their environmental impacts, these initiatives promote social inclusion and food security, offering alternatives for subsistence and economic engagement for vulnerable families (Carvalho et al., 2021). By linking environmental sustainability and social justice, urban agroecology demonstrates that localized interventions, based on traditional and scientific knowledge, can generate broad positive effects, serving as a model for public policies that seek more equitable, resilient, and sustainable cities in tropical urban contexts.

In addition to its socio-environmental function, urban agroecology acts as an alternative to the productivist model imposed by the Green Revolution, which, although it increased agricultural productivity, deepened social inequalities and caused significant environmental damage. By adopting agroecological principles, these initiatives seek more sustainable, inclusive, and resilient food production, aligned with the principles of environmental justice and sustainable territorial development. Such practices demonstrate that it is possible to reverse the logic of the neoliberal city, promoting urbanization that respects ecological limits and the needs of vulnerable populations (Carvalho et al., 2021).

In this sense, urban agroecology proposes a city model that integrates urban planning, socio-environmental resilience, and territorial justice. By valuing urban soil as a living resource and promoting the active participation of communities in the management of their territories, these initiatives offer concrete alternatives for building more equitable and sustainable cities. The articulation between agroecological practices and public policies is essential to consolidate this model, ensuring that the cities of the future are able to face the challenges posed by climate change and growing social inequality.

4 FINAL CONSIDERATIONS

Brazilian cities, especially Salvador, show that urban development follows a neoliberal logic that accentuates socio-spatial inequalities and weakens urban ecosystems. Peripheral territories and irregular settlements, often located on hillsides and in risk areas, express both social and environmental vulnerability, reflecting soil degradation, precarious infrastructure, and exposure to extreme events such as floods and landslides. Recognizing urban soil as a living and strategic territory is essential, as its degradation compromises fundamental ecological functions, such as infiltration and water regulation, and intensifies social exclusion, highlighting the need for public policies that integrate urban planning and environmental sustainability.

In this context, urban agroecology practices, such as community gardens, productive backyards, and collective composting systems, demonstrate that it is possible to redefine marginalized territories, promoting food security, strengthening community ties, and recovering degraded areas. Such practices constitute concrete strategies for socio-environmental justice and resistance to the exclusionary logic of the neoliberal city. To build the metropolis of the future, urban policies must integrate sustainable soil management, the expansion of urban agroecological practices, participatory planning that includes historically excluded communities, and integration with climate resilience agendas.

The study shows that the articulation between soil science, agroecology, and critical geography offers design perspectives for more inclusive, sustainable, and resilient cities, in which peripheral territories become spaces for socio-environmental innovation and urban challenges are addressed with social justice, ecological sustainability, and the valorization of urban soil as a strategic resource.

REFERENCES

ALTIERI, M. **Agroecologia: bases científicas para uma agricultura sustentável**. São Paulo: Expressão Popular, 2012.

BAHIA. **Plano Diretor de Desenvolvimento Urbano do Município do Salvador - PDDU**. Lei nº 9.069, de 30 de junho de 2016. Salvador: Prefeitura Municipal de Salvador, 2016. Disponível em: <https://sedur.salvador.ba.gov.br/pddu-2016/18-legislacao/65-leis-pddu>. Acesso: 16 fev. 2026.

CARVALHO, André Roncaglia de et al. Social vulnerability and health crisis in Brazil. **Cadernos de Saúde Pública**, v. 37, p. e00071721, 2021. DOI: <https://doi.org/10.1590/0102-311X00071721>.

CASTRO, J. A. G. Denaturalizing climate change: Environmental injustice and social vulnerability in contexts of socio-spatial segregation in Mexico. **International Journal of Disaster Risk Reduction**, v. 94, p. 103802, 2023. DOI: <https://doi.org/10.1016/j.ijdr.2023.103802>.

CLERICI, E.; RICOTTA, G. Social exclusion and marginality in urban areas: Decolonizing theoretical and conceptual frameworks. **Rivista Trimestrale Di Scienza Dell'amministrazione**, p. 1-23, 2025. DOI: <https://doi.org/10.32049/RTSA.2025.1.06>.

Companhia de Desenvolvimento Urbano do Estado da Bahia (CONDER). **Documentos e publicações**, 2026. Disponível em: <https://www.conder.ba.gov.br/index.php/biblioteca/all>. Acesso: 16 fev. 2026.

CORRÊA, Lina; CARRIELLO, Felix; CARVALHO, Rubens M. R. Densidade Urbana: avaliação do estoque construído e seus potenciais. **Revista Nacional de Gerenciamento de Cidades**, [S. l.], v. 14, n. 91, p. e2525, 2026. DOI: [10.17271/23188472149120266208](https://doi.org/10.17271/23188472149120266208).

DRAGAN, A.; CREȚAN, R.; LUNGU, M. A. Neglected and peripheral spaces: Challenges of Socioeconomic Marginalization in a south Carpathian area. **Land**, v. 13, n. 7, p. 1086, 2024. DOI: <https://doi.org/10.3390/land13071086>.

FALS BORDA, O. Democracia y participación: algunas reflexiones, **Revista Colombiana de Sociología**, v. 5, n. 1, Bogotá, 1987, p. 35-40.

GIGLIOLI, I. On not being European enough. Migration, crisis and precarious livelihoods on the periphery of Europe. **Social & Cultural Geography**, v. 22, n. 5, p. 725-744, 2021. DOI: <https://doi.org/10.1080/14649365.2019.1601248>.

GLIESSMAN, S. Agroecology and the UN Sustainable Development Goals (SDGs). **Agroecology and Sustainable Food Systems**, v. 49, n. 7, p. 989-993, 2025. DOI: <https://doi.org/10.1080/21683565.2025.2506190>.

GODOY, J. A. R.; BENINI, S. M. Resiliência urbana: políticas para enfrentar desastres naturais e mudanças climáticas. **Revista Políticas Públicas & Cidades**, v. 13, n. 1, p. e775-e775, 2024. DOI: <https://doi.org/10.23900/2359-1552v13n1-34-2024>.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). **Censo Demográfico 2022: resultados preliminares da amostra**. Rio de Janeiro: IBGE, 2023. Disponível em: <https://www.ibge.gov.br/>. Acesso em: 16 fev. 2026.

JESUS, Arnaldo Bispo et al. Cidades inteligentes: caminhos para a inclusão socioambiental em centros urbanos e periurbanos na região do sisal–bahia através da agroecologia. **ARACÊ**, v. 7, n. 3, p. 11265-11287, 2025. DOI: <https://doi.org/10.56238/arev7n3-068>.

NASCIMENTO, M. F. F.; FREIRE, J. T.; **Atlas Ambiental Infanto-Juvenil de Salvador**. Prefeitura Municipal do Salvador, 1ª edição. Salvador: Secretaria da Educação e Cultura, Secretaria do Planejamento, Urbanismo e Meio Ambiente, Superintendência do Meio Ambiente, 2006, 52p. Disponível em: <http://educacao3.salvador.ba.gov.br/adm/wp-content/uploads/2018/03/atlas-ambiental-infanto-juvenil.pdf>. Acesso: 16 fev. 2026.

OLIVEIRA, W. N. M.; SILVA, J. B. G.; GOMES, M. H. R.; ROCHA, C. H. B.; PIZZO, H. S. O impacto da implantação dos Sistemas Urbanos de Drenagens Sustentáveis (SUDS) em um bairro central de uma cidade de grande porte de Minas Gerais. **Revista Nacional de Gerenciamento de Cidades**, [S. l.], v. 13, n. 88, 2025. DOI: <https://doi.org/10.17271/23188472138820255514>.

PORTO-GONÇALVES, C. W. **A globalização da natureza e a natureza da globalização**. Rio de Janeiro, Civilização brasileira, 2006.

RIBEIRO, J. F.B.; FERREIRA, M. S. The Seed Network of the Web of Peoples, in Bahia: dialogues on ancestry and territorialities in the construction of food Sovereignty. **Cadernos de Agroecologia**, ISSN2236-7934 – Anais do XII Congresso Brasileiro de Agroecologia, Rio de Janeiro, Rio de Janeiro, v.19, n.1, 2024.

SANTANA, S. B.; DELAPORTE, M. C. M. Agricultura urbana em territórios populares da Região Metropolitana de Salvador: uma prática contra-hegemônica? **Dissertação**. Universidade Católica de Salvador. 2022. Disponível em: <https://ri.ucsal.br/handle/123456789/5555>. Acesso em: 16 fev. 2026.

SANTANA, J. S.; FARIAS, U. P. L. Racismo Ambiental: a divisão racial da cidade de Salvador e os impactos ambientais. **Educação Sem Distância-Revista Eletrônica da Faculdade Unyleya**, v. 2, n. 2, 2021.

SILVA, L. V.; BRASILEIRO, R. S. Agricultura de base agroecológica: um estudo de caso sobre as estratégias de produção sustentável no município de Barreiras-Ba. **Geografia em Questão**, v. 15, n. 02, 2022. DOI: <https://doi.org/10.48075/geoq.v15i02.25458>.

SOUZA, S. A. S.; BORNE, I.; CRUZ, R. S.; TEIXEIRA, V. B. F.; SILVEIRA, J. A. R. Análise dos espaços verdes urbanos por sensoriamento remoto em um bairro de João Pessoa, Brasil. **Revista Nacional de Gerenciamento de Cidades**, [S. l.], v. 13, n. 89, 2025. DOI: <https://doi.org/10.17271/23188472138920255795>.

SOUZA, V. B.; SANTOS, C. M. N. S. S.; SANTOS, A. C. S. Análise socioespacial da feira livre no bairro Califórnia em Itabuna-Ba: conflitos e dinâmicas da paisagem. **Geografia Grapiúna**, v. 4, n. 5, p. 51-63, 2024. DOI: <https://doi.org/10.36113/geog.v4i5.4076>.

TARRÃO, Paloma Ribeiro et al. Horta comunitária urbana de base popular, agroecológica e solidária: experiência da horta Gera Juncal, Zona leste, São Paulo, SP. **Org & Demo**, v. 25, p. e024014-e024014, 2024. DOI: <https://doi.org/10.36311/1519-0110.2024.v25.e024014>.

TRINDADE, T.; AMUSQUIVAR, E. A cidade neoliberal na América Latina e a erosão do espaço público democrático1. **La reinvencción de lo urbano Las ciudades latinoamericanas en el siglo XXI**, p. 191, 2025.

DECLARATIONS

CONTRIBUTION OF EACH AUTHOR

- **Study Concept and Design:** Assis, L. L. R.
- **Data Curation:** Assis, L. L. R.
- **Formal Analysis:** Assis, L. L. R.
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- **Writing:** Assis, L. L. R.
- **Review and Final Editing:** Assis, L. L. R.
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DECLARATION OF CONFLICTS OF INTEREST

I, Lucas Lenin Resende de Assis, declare that the manuscript entitled "Urban soil and agroecology as axes for the metropolis of the future: socio-environmental challenges and perspectives for sustainable cities":

1. **Financial ties:** No institution or funding entity was involved in the development of this study.
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