


## CLIMATE JUSTICE IN URBAN AMAZONIA: A CRITICAL ANALYSIS OF SOCIO-ENVIRONMENTAL VULNERABILITIES AND THE ROLE OF COP30 IN BELÉM

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### ABSTRACT

This theoretical essay critically examines socio-environmental vulnerabilities in urban areas of the Amazon, focusing on Belém and the upcoming COP30. The Amazon region, vital to the global climate, faces growing challenges due to climate change and disorderly urban expansion. Climate justice is imperative to ensure equity in the distribution of the burdens and benefits of climate policies, especially for disproportionately affected marginalized populations. Amazonian urbanization, driven by deforestation and migration, creates cities with poor infrastructure and high exposure to extreme weather events. COP30 in Belém is a unique opportunity to refocus global climate discussions by integrating local perspectives and the needs of Amazonian communities. We argue that socio-environmental vulnerability in Belém reflects historical and structural inequalities that limit adaptation and resilience. We propose an analytical framework to understand the intersection between climate justice, urbanization, and vulnerability in the Amazon, emphasizing participatory and fair approaches to policy. We fill a gap in the literature by focusing on the urban dimension of the Amazon climate crisis, offering insights for climate governance and sustainable urban development. We conclude that COP30 should catalyze concrete actions to promote climate justice, urban resilience, and the protection of the rights of vulnerable communities in the urban Amazon, transforming global discourse into locally relevant and equitable solutions.

**Keywords:** Climate Justice. Urban Amazon. Socio-environmental Vulnerability. COP30. Belem. Sustainable Development.

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## **JUSTIÇA CLIMÁTICA NA AMAZÔNIA URBANA: UMA ANÁLISE CRÍTICA DAS VULNERABILIDADES SOCIOAMBIENTAIS E O PAPEL DA COP30 EM BELÉM**

### **RESUMO**

Este ensaio teórico examina criticamente as vulnerabilidades socioambientais em áreas urbanas da Amazônia, com foco em Belém e na próxima COP30. A região amazônica, vital para o clima global, enfrenta desafios crescentes devido às mudanças climáticas e à expansão urbana desordenada. A justiça climática é fundamental para garantir a equidade na distribuição dos ônus e benefícios das políticas climáticas, especialmente para as populações marginalizadas desproporcionalmente afetadas. A urbanização amazônica, impulsionada pelo desmatamento e pela migração, cria cidades com infraestrutura precária e alta exposição a eventos climáticos extremos. A COP30 em Belém é uma oportunidade única para reorientar as discussões climáticas globais, integrando perspectivas locais e as necessidades das comunidades amazônicas. Argumentamos que a vulnerabilidade socioambiental em Belém reflete desigualdades históricas e estruturais que limitam a adaptação e a resiliência. Propomos uma estrutura analítica para compreender a intersecção entre justiça climática, urbanização e vulnerabilidade na Amazônia, enfatizando abordagens participativas e justas para as políticas. Preenchemos uma lacuna na literatura, concentrando-nos na dimensão urbana da crise climática na Amazônia, oferecendo insights para a governança climática e o desenvolvimento urbano sustentável. Concluimos que a COP30 deve catalisar ações concretas para promover a justiça climática, a resiliência urbana e a proteção dos direitos das comunidades vulneráveis na Amazônia urbana, transformando o discurso global em soluções localmente relevantes e equitativas.

**Palavras-chave:** Justiça Climática. Amazônia Urbana. Vulnerabilidade Socioambiental. COP30. Belém. Desenvolvimento Sustentável.

## **JUSTICIA CLIMÁTICA EN LA AMAZONÍA URBANA: UN ANÁLISIS CRÍTICO DE LAS VULNERABILIDADES SOCIOAMBIENTALES Y EL PAPEL DE LA COP30 EN BELÉM**

### **RESUMEN**

Este ensayo teórico examina críticamente las vulnerabilidades socioambientales en las zonas urbanas de la Amazonía, con especial atención a Belém y la próxima COP30. La región amazónica, vital para el clima global, enfrenta desafíos crecientes debido al cambio climático y la expansión urbana desordenada. La justicia climática es imperativa para garantizar la equidad en la distribución de las cargas y los beneficios de las políticas climáticas, especialmente para las poblaciones marginadas que se ven desproporcionadamente afectadas. La urbanización amazónica, impulsada por la deforestación y la migración, genera ciudades con infraestructura deficiente y una alta exposición a fenómenos meteorológicos extremos. La COP30 en Belém representa una oportunidad única para reorientar el debate climático global integrando las perspectivas locales y las necesidades de las comunidades amazónicas. Argumentamos que la vulnerabilidad socioambiental en Belém refleja desigualdades históricas y estructurales que limitan la adaptación y la resiliencia. Proponemos un marco analítico para comprender la intersección entre la justicia climática, la urbanización y la vulnerabilidad en la Amazonía, haciendo hincapié en enfoques participativos y justos para la formulación de políticas. Abarcamos una brecha en la literatura al centrarnos en la dimensión urbana de la crisis climática amazónica, ofreciendo perspectivas para la gobernanza climática y el desarrollo

urbano sostenible. Concluimos que la COP30 debería impulsar acciones concretas para promover la justicia climática, la resiliencia urbana y la protección de los derechos de las comunidades vulnerables en la Amazonía urbana, transformando el discurso global en soluciones localmente relevantes y equitativas.

**Palabras clave:** Justicia Climática. Amazonía Urbana. Vulnerabilidad Socioambiental. COP30. Belém. Desarrollo Sostenible.

## 1 INTRODUCTION

The Amazon, a biome of inestimable ecological and socioeconomic value, is at the epicenter of global discussions on climate change and sustainable development (Azevedo et al., 2020; Lapola et al., 2021). Historically perceived as a vast expanse of untouched forest, the reality of the Amazon is complex and multifaceted, home to a growing urban population facing unique challenges in a scenario of rapid environmental and social change (Angeoletto et al., 2023; Ribeiro et al., 2022). Urbanization in the Amazon, often driven by deforestation and migration dynamics, has led to cities with poor infrastructure and populations that are highly vulnerable to the impacts of climate change, such as droughts, and heat waves (Silva Junior et al., 2022; Xu et al., 2022; Anthony et al., 2021). In this context, climate justice emerges as a fundamental concept, seeking to ensure that the burdens and benefits of climate policies and actions are distributed equitably, especially to the most marginalized and historically excluded communities (Bowser et al., 2020; Granberg & Glover, 2021; Byskov et al.). The holding of COP30 in Belém, capital of Pará, in 2025, is not only a diplomatic event of global relevance, but a crucial milestone in reorienting the climate debate towards the realities and needs of Amazonian populations, offering an unprecedented platform to discuss urban socio-environmental vulnerabilities and promote fair and effective solutions (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023).

Against this backdrop, this theoretical essay aims to answer the following research question: **How can urban socio-environmental vulnerabilities in Belém, in light of COP30, be critically analyzed from a climate justice perspective, and what are the implications for the formulation of adaptation and resilience policies and practices?** The central objective of this work is, therefore, to conduct a critical review of urban socio-environmental vulnerabilities in Belém, examining them through the lens of climate justice and considering the context of COP30 as a catalyst for action and reflection. We seek to identify the main factors that contribute to the vulnerability of Amazonian urban populations, analyze the dimensions of climate injustice present in this context, and propose paths for more equitable and effective governance (Drakes & Tate, 2022; Lee et al., 2022; Mah et al., 2023).

The existing literature on climate change in the Amazon has focused predominantly on the dynamics of deforestation, forest conservation, and their impacts on ecosystems and traditional populations (Brando et al., 2020; Lapola et al., 2021; Pokorny et al., 2021). Although this approach is crucial, there is a significant gap in terms of a deeper understanding

of socio-environmental vulnerabilities in Amazonian urban areas and the application of the concept of climate justice in this specific context (Ribeiro et al., 2022; Domaradzka et al., 2022). Studies on social vulnerability often address natural disasters in a more generic way, without specifically focusing on the urban Amazon and the intersection with climate justice (Bucherie et al., 2022; Guerrero et al., 2022). Similarly, the discussion on COP30, although growing, still lacks an in-depth analysis of how the event can catalyze local transformations and promote climate justice in Amazonian cities and urban areas (Atwoli et al., 2023; Mar et al., 2023). This essay fills this gap by integrating the analysis of urban socio-environmental vulnerabilities with the perspective of climate justice, using COP30 in Belém as a focal point for discussion and the proposal of solutions. We position ourselves as a new and relevant contribution by bringing to the center of the debate the urban dimension of the climate crisis in the Amazon, an aspect often neglected in favor of approaches more focused on the rural or forest environment (Angeoletto et al., 2023; Souza et al., 2023).

The theoretical contributions of this essay are multiple. First, we deepen the understanding of climate justice by applying it to an Amazonian urban context, highlighting the specificities of the vulnerabilities and injustices that emerge from the interaction between urbanization, climate change, and social inequalities (Granberg & Glover, 2021; Drakes & Singh, 2022; Olsson, 2022). Second, we develop an analytical framework that allows for a more comprehensive identification and assessment of urban socio-environmental vulnerabilities, considering not only physical exposure but also the social, economic, and political dimensions that shape communities' adaptive capacity (Mah et al., 2023; Lee et al., 2022; Bucherie et al., 2022). Finally, this work contributes to the literature on climate governance by exploring the role of global events such as COP30 in promoting local action and building bridges between global discourse and regional realities (Glaas et al., 2022; Kiss et al., 2022; Mar et al., 2023). The managerial implications are equally significant. This essay offers insights for public policymakers, urban managers, and civil society organizations working in the Amazon, providing insights for the development of climate adaptation and resilience strategies that are socially just and environmentally sustainable (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022). Critical analysis of vulnerabilities and an emphasis on climate justice can guide resource allocation, urban planning, and the implementation of projects that benefit the most affected populations, promoting citizen participation and local empowerment (Hügel & Davies, 2020; Wynne, 2021; Wynne et al., 2022).

This theoretical essay is structured to present a cohesive and in-depth analysis of the topic. It begins with this introduction, which contextualizes the problem, presents the research question, the objective, and the contributions of the work. Next, the article will discuss climate justice and its multiple dimensions, focusing on its application in urban contexts and the specificities of the Amazon. Subsequently, an analysis of urban socio-environmental vulnerabilities in Belém will be carried out, identifying the main risk factors and the most affected populations. The role of COP30 will then be examined as a vector for transformation and a space for promoting climate justice in the region. Finally, the essay will present conclusions, implications for future research, and recommendations for practice, aiming to contribute to the construction of more just, resilient, and sustainable Amazonian cities in the face of the challenges posed by climate change.

## **2 THEORETICAL FOUNDATIONS**

### **2.1 ANALYSIS OF CLIMATE JUSTICE IN THE URBAN AMAZON**

Climate justice is a field of study and activism that seeks to address the inequalities inherent in the impacts of climate change, as well as the responses to them (Bowser et al., 2020; Granberg & Glover, 2021; Byskov et al.). In the context of the urban Amazon, this analysis becomes particularly complex and urgent, given the intersection of historical socio-environmental vulnerabilities and the growing pressure of urbanization on fragile ecosystems (Angeoletto et al., 2023; Ribeiro et al., 2022; Souza et al., 2023). The Amazon, while crucial for global climate regulation, is home to urban populations that often lack adequate infrastructure and are disproportionately affected by extreme weather events such as floods and droughts, which are intensifying with climate change (Silva Junior et al., 2022; Xu et al., 2022; Anthony et al., 2021).

The concept of climate justice in the urban Amazon transcends the mere equitable distribution of the burdens and benefits of climate policies; it also encompasses procedural justice, which refers to the meaningful participation of affected communities in decisions that impact them, and epistemic justice, which values and incorporates local and traditional knowledge in the formulation of solutions (Drakes & Singh, 2022; Olsson, 2022; Hügel & Davies, 2020). Unplanned urbanization in the Amazon region, often the result of migration and inadequate urban planning, exacerbates existing vulnerabilities, creating scenarios where the poorest and most marginalized populations are the first and hardest hit by climate impacts (Bucherie et al., 2022; Lee et al., 2022; Mah et al., 2023). The analysis of climate



justice, therefore, requires an understanding of the historical and structural roots of these inequalities, which include colonization, natural resource exploitation, and government neglect (Horn, 2023; Pokorny et al., 2021; Viola & Franchini, 2020).

Additionally, the analysis of climate justice in the urban Amazon must consider the role of global events such as COP30 in Belém. Such conferences, while important for international climate diplomacy, need to translate their commitments into concrete and fair actions at the local level, ensuring that the voices of Amazonian communities are heard and their needs are met (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). COP30 offers a platform to highlight the specific vulnerabilities of Amazonian cities and to promote adaptation and resilience approaches that are culturally appropriate and socially equitable (Falk et al., 2022; Glaas et al., 2022; Kiss et al., 2022). The transition to more just and sustainable cities in the Amazon requires climate governance that integrates science, citizen participation, and innovation, aiming to build a future where human rights and environmental sustainability go hand in hand (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022).

## 2.2 SOCIO-ENVIRONMENTAL VULNERABILITY: STRUCTURAL CHALLENGES AND INJUSTICES

Socio-environmental vulnerability, in the context of climate change, refers to the propensity of a social or ecological system to be adversely affected by climate impacts, considering its exposure, sensitivity, and adaptive capacity (Drakes & Tate, 2022; Lee et al., 2022; Mah et al., 2023). In the urban Amazon, this vulnerability is intensified by a series of structural challenges and injustices that manifest themselves at different levels. Rapid and often disorderly urbanization in the region has led to the occupation of risk areas, such as riverbanks and hillsides, making populations more susceptible to extreme events such as floods and landslides (Ribeiro et al., 2022; Silva Junior et al., 2022; Bucherie et al., 2022).

Structural injustices are evident in the unequal distribution of climate risks and impacts. Low-income communities, indigenous and quilombola populations, and other marginalized groups are disproportionately affected, not only by greater physical exposure, but also by lower response and recovery capacity due to lack of access to basic services, adequate infrastructure, financial resources, and political power (Bowser et al., 2020; Granberg & Glover, 2021; Byskov et al.). This disparity is a reflection of historical processes of exclusion and discrimination, which perpetuate cycles of vulnerability and limit the capacity of these

communities to adapt to climate change (Horn, 2023; Pokorny et al., 2021; Viola & Franchini, 2020).

Furthermore, environmental and urban governance in the Amazon often fails to integrate social and justice dimensions into its adaptation policies and plans. Decision-making tends to be centralized and technocratic, neglecting the participation and knowledge of local communities, which exacerbates procedural and epistemic injustices (Hügel & Davies, 2020; Kiss et al., 2022; Olsson, 2022). The lack of recognition and appreciation of the experiences and knowledge of these populations in building effective solutions for climate adaptation is a significant challenge that needs to be overcome to promote true climate justice in the urban Amazon (Drakes & Singh, 2022; Wynne, 2021; Wynne et al., 2022). A deeper understanding of these structural injustices is essential to develop resilience strategies that are not only environmentally effective but also socially equitable and fair (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022).

### 2.3 THE INTERSECTION BETWEEN LOCAL PUBLIC POLICIES AND INTERNATIONAL COMMITMENTS: COP30 AS A POINT OF CONVERGENCE

Effective climate governance requires complex coordination between different levels of action, from local public policies to international commitments (Glaas et al., 2022; Kiss et al., 2022; Olsson, 2022). The urban Amazon, with its particularities and challenges, emerges as a laboratory for observing this intersection, especially in the context of COP30 in Belém. Local public policies, such as master plans, building codes, and environmental regulations, play a key role in shaping urban resilience and mitigating socio-environmental vulnerabilities (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022). However, the effectiveness of these policies is often limited by budget constraints, institutional capacity, and political pressures, as well as a lack of integration with the realities and needs of local communities (Hügel & Davies, 2020; Wynne, 2021; Wynne et al., 2022).

On the other hand, international commitments, such as the Paris Agreement and the Sustainable Development Goals, establish a global framework for climate action, but their implementation depends largely on the capacity of countries and cities to translate these guidelines into concrete and contextualized actions (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). COP30 in Belém represents a unique point of convergence, where the global climate discourse meets the local reality of the urban Amazon. This event offers an unprecedented opportunity for the voices of Amazonian communities to be amplified on the



international stage and for discussions on climate justice and socio-environmental vulnerability to take center stage on the global agenda (Azevedo et al., 2020; Lapola et al., 2021; Bowser et al., 2020).

The intersection between the local and the global in climate governance is not without tensions. Often, the priorities and interests of local actors may diverge from international agendas, and the implementation of global policies may not take into account the cultural and socioeconomic specificities of regions (Horn, 2023; Pokorny et al., 2021; Viola & Franchini, 2020). COP30 in Belém, therefore, is not only a forum for negotiations, but a space for building bridges between these different levels of governance, promoting a more inclusive dialogue and the search for solutions that are both globally ambitious and locally relevant and fair. The ability to transform international commitments into effective and equitable actions in Amazonian cities will be a crucial test for global climate governance and for building a more resilient and sustainable future for the region (Falk et al., 2022; Granberg & Glover, 2021; Drakes & Tate, 2022).

## 2.4 CLIMATE RESILIENCE MODEL FOR THE URBAN AMAZON

Building a climate resilience model for the urban Amazon is imperative in light of the challenges posed by climate change and the region's growing urbanization (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022). Climate resilience, in this context, is not limited to a system's ability to return to its original state after a shock, but involves the ability to adapt and transform in the face of disturbances, incorporating lessons learned and promoting social and environmental justice (Glaas et al., 2022; Kiss et al., 2022; Olsson, 2022). An effective model for the urban Amazon must be multifaceted, considering the ecological, social, economic, and institutional dimensions of resilience.

Ecologically, the model should integrate the conservation and restoration of urban and peri-urban ecosystems, such as floodplains, streams, and forest fragments, which play crucial roles in water regulation, heat island mitigation, and the provision of ecosystem services (Azevedo et al., 2020; Lapola et al., 2021; Ribeiro et al., 2022). Socially, resilience is strengthened by promoting citizen participation, community empowerment, and valuing local and traditional knowledge in the formulation and implementation of adaptation strategies (Hügel & Davies, 2020; Wynne, 2021; Wynne et al., 2022). The inclusion of vulnerable groups, such as riverine populations, indigenous peoples, and residents of risk areas, is essential to ensure that solutions are equitable and meet the needs of all (Bowser et al.,

2020). The inclusion of vulnerable groups, such as riverine populations, indigenous peoples, and residents of risk areas, is essential to ensure that solutions are equitable and meet the needs of all (Bowser et al., 2020; Granberg & Glover, 2021; Byskov et al.).

Economically, the resilience model should seek to diversify productive activities, promote green economies, and create employment and income opportunities that are compatible with environmental sustainability and social justice (Domaradzka et al., 2022; Olsson, 2022; Falk et al., 2022). Institutionally, resilience requires adaptive and integrated governance, with coordination between different levels of government, sectors, and social actors, and the ability to learn from experience and adjust policies in response to climate change (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). COP30 in Belém can serve as a catalyst for the development and implementation of such models by promoting knowledge exchange, resource mobilization, and strengthening partnerships between local, national, and international actors, aiming to build more resilient, fair, and sustainable Amazonian cities (Bucherie et al., 2022; Drakes & Tate, 2022; Mah et al., 2023).

### **3 METHODOLOGY**

This theoretical essay adopts a qualitative and exploratory methodological approach, based on a critical review of the scientific literature and relevant documents. The nature of the theoretical essay requires an argumentative construction, which is based on the analysis and synthesis of existing knowledge to develop new perspectives and fill theoretical gaps (Wen et al., 2023; Taylor, 2023). The methodology employed aims to understand climate justice in the urban Amazon, focusing on socio-environmental vulnerabilities in Belém and the role of COP30 as a catalyst for change. To this end, bibliographic research was conducted based on the references provided, which cover several areas of knowledge, including sustainability, environmental sciences, urban geography, sociology, and public policy (Azevedo et al., 2020; Lapola et al., 2021; Bowser et al., 2020).

The literature review process followed systematic steps to ensure the consistency of the arguments. First, the articles and documents were read with the aim of identifying the main concepts, theories, and debates related to climate justice, socio-environmental vulnerability, and urbanization in the Amazon (Drakes & Tate, 2022; Lee et al., 2022; Mah et al., 2023). Next, gaps in the literature were identified, especially regarding the intersection between the urban dimension of the climate crisis in the Amazon and the application of the concept of climate justice (Ribeiro et al., 2022; Domaradzka et al., 2022). The analysis

allowed us to construct a theoretical position that recognizes the complexity of the interactions between socioecological systems and urban dynamics and that underpins the arguments presented throughout the essay (Angeoletto et al., 2023; Souza et al., 2023; Boulanger & Massari, 2022).

In addition, the methodology included an analysis of the context of COP30 in Belém, not only as an isolated event, but as a point of convergence for discussions on local public policies and international commitments (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). Understanding the assumptions underlying the arguments for and against existing approaches to climate adaptation and resilience was crucial to characterizing the author's position on the theories discussed (Hügel & Davies, 2020; Kiss et al., 2022; Olsson, 2022). The construction of the theoretical essay, therefore, was not limited to a mere compilation of information, but sought a conceptual articulation that would allow the development of a climate resilience model for the urban Amazon, considering local specificities and the need for participatory and equitable approaches (Fuldauer et al., 2022; Bonatti et al., 2022; Glaas et al., 2022). The basis of the methodology lies in its ability to integrate different perspectives and build a theoretical framework that contributes to the existing literature, offering insights for future research and for environmental and urban management practices in the Amazon region.

## **4 RESULTS**

This theoretical essay offers significant contributions to the literature on several fronts. First, by focusing on the urban dimension of the climate crisis in the Amazon, the article fills an important gap in research that has historically prioritized the dynamics of deforestation and forest conservation at the expense of the socio-environmental complexities of Amazonian cities (Ribeiro et al., 2022; Angeoletto et al., 2023; Souza et al., 2023). This approach expands the scope of the discussion on climate change and climate in the region, highlighting the specificities of urban vulnerabilities and the need for policies and interventions adapted to these contexts.

Second, the essay deepens the application of the concept of climate justice to the Amazonian urban context. By critically analyzing how historical and structural inequalities manifest themselves in the distribution of climate impacts and in the adaptive capacity of urban populations, the paper contributes to a more nuanced understanding of climate justice, which goes beyond mere equity in mitigation and adaptation to also encompass procedural

justice and epistemic justice (Bowser et al., 2020; Granberg & Glover, 2021; Drakes & Singh, 2022). This perspective is crucial for the development of more effective and equitable approaches to climate governance.

Additionally, this article contributes to the literature on environmental and climate governance by examining the role of global events, such as COP30, in catalyzing local action and building bridges between global discourse and regional realities (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). By highlighting the importance of integrating local perspectives and the needs of Amazonian communities into international climate discussions, the essay offers insights into how climate diplomacy can become more inclusive and relevant to the most affected populations (Glaas et al., 2022; Kiss et al., 2022; Olsson, 2022).

Finally, the paper proposes a conceptual framework for analyzing urban socio-environmental vulnerabilities that can be replicated in other developing cities, especially those located in regions with high biodiversity and under climate pressure (Bucherie et al., 2022; Lee et al., 2022; Mah et al., 2023). By integrating the physical, social, economic, and political dimensions of vulnerability, the study offers an analytical tool for researchers and policymakers seeking to understand and mitigate climate risks in complex urban environments. The managerial implications arising from this analysis are substantial, providing a guide for the development of urban resilience strategies that are socially just and environmentally sustainable, promoting citizen participation and local empowerment (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022).

## 5 DISCUSSION

The critical analysis of urban socio-environmental vulnerabilities in the Amazon, especially in Belém, shows that historical and structural inequalities remain major obstacles to the promotion of climate justice in the region. Uncontrolled urban expansion, driven by migration and lack of planning, has led to the occupation of risk areas and the deterioration of urban infrastructure. This makes the poorest and most marginalized populations—such as indigenous, quilombola, and riverine communities—especially vulnerable to the impacts of climate change, such as floods, heat waves, and droughts.

In discussing climate justice, the article highlights the importance of considering not only the equitable distribution of the burdens and benefits of climate policies, but also the effective inclusion of local communities in decision-making processes (procedural justice) and the recognition of the traditional knowledge and life experiences of these populations

(epistemic justice). Public policies often adopt technocratic and centralized approaches that fail to take into account the social and cultural reality of urban Amazonia, which limits the effectiveness of adaptation and resilience strategies.

In this sense, COP30 in Belém emerges as a historic opportunity to reposition Amazonian cities at the center of the global climate debate. However, for COP30 to fulfill its transformative potential, it is essential that the event goes beyond diplomatic discussions and translates into concrete commitments that prioritize the needs of the most vulnerable populations. This implies strengthening social participation, valuing local knowledge, and ensuring that policies are designed in a manner that is sensitive to regional specificities.

Another relevant point discussed is the need for integration between local public policies and international commitments. The effectiveness of climate governance depends on coordination between different levels of power and the development of solutions adapted to the Amazonian context. COP30 can be the catalyst for this process, promoting the exchange of experiences, the mobilization of resources, and the development of resilience models that consider the ecological, social, and economic complexity of Amazonian cities.

Finally, the discussion points out that building fairer, more resilient, and sustainable Amazonian cities depends on overcoming the structural injustices that perpetuate socio-environmental vulnerability. Promoting climate justice in the urban Amazon requires integrated public policies based on science, social inclusion, and valuing the multiple voices that make up the region's urban fabric. The challenge lies in transforming the global climate discourse into locally relevant actions, ensuring that no one is left behind in addressing the climate crisis.

## **6 CONCLUSION**

This theoretical essay undertook a critical review of urban socio-environmental vulnerabilities in Belém from a climate justice perspective and in the context of the upcoming COP30. The analysis demonstrated that the urban Amazon, and Belém in particular, faces climate challenges exacerbated by socioeconomic inequalities and inadequate infrastructure, resulting in a disproportionate distribution of the impacts of climate change on the most vulnerable populations (Ribeiro et al., 2022; Silva Junior et al., 2022; Angeoletto et al., 2023). Climate justice, therefore, is not just a theoretical concept, but a pressing need for building more equitable and resilient cities in the Amazon region (Bowser et al., 2020; Granberg & Glover, 2021; Byskov et al. ).

The results of this review reinforce the complexity of the issue of socio-environmental vulnerability in Amazonian urban environments, which goes beyond physical exposure to extreme weather events to also encompass the social, economic, and political dimensions that limit communities' capacity for adaptation and resilience (Bucherie et al., 2022; Drakes & Tate, 2022; Mah et al., 2023). COP30 in Belém represents a strategic opportunity for global climate discussions to incorporate local realities and promote concrete actions aimed at reducing these vulnerabilities and promoting climate justice (Atwoli et al., 2023; Clemençon, 2023; Mar et al., 2023). It is imperative that public policies and adaptation initiatives be designed in a participatory manner, ensuring that the voices of the most affected communities are heard and that their needs are prioritized (Hügel & Davies, 2020; Kiss et al., 2022; Olsson, 2022).

In short, the transition to more just and sustainable Amazonian cities requires an integrated approach that combines scientific knowledge with local knowledge, technological innovation with social inclusion, and global commitments with local actions (Fuldauer et al., 2022; Bonatti et al., 2022; Boulanger & Massari, 2022). COP30 can be the catalyst for this transformation, provided there is a genuine commitment to addressing the roots of climate injustices and empowering communities to become agents of their own resilience. The future of the urban Amazon depends on our ability to build a development model that is truly equitable and sustainable, where climate justice is the cornerstone of all actions and decisions.

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