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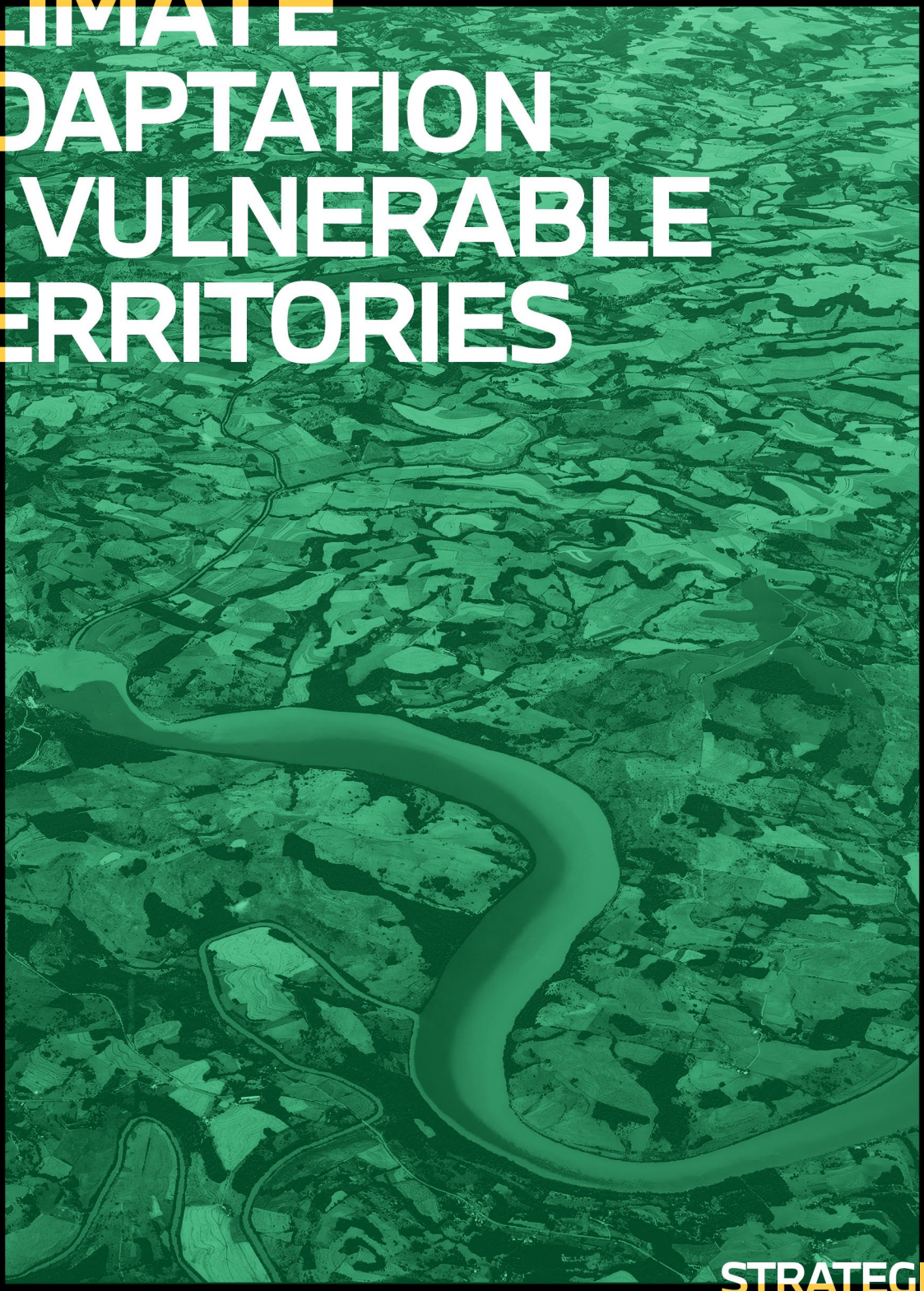
Herbert Quandt

CLIMATE ADAPTATION IN VULNERABLE TERRITORIES



STRATEGIES FOR EQUITABLE FINANCING

Contents

Introduction

One of the greatest challenges facing humanity in the 21st century is climate change. Scientific evidence demonstrates that since the 1850-1900 period, Earth's average temperature has risen by 1.1°C due to anthropogenic activity—particularly the release of greenhouse gases (GHGs) into the atmosphere (IPCC, 2023). As the planet heats, impacts intensify, including the increasing frequency and severity of extreme weather events, adverse effects on public health, rising sea levels, and resource scarcity.

Given its complexity, this crisis can only be addressed through collective effort, at both international and local levels. Since 1992, with the establishment of the United Nations Framework Convention on Climate Change (UNFCCC), nations have convened annually at the Conferences of the Parties (COPs) to deliberate on solutions and define pathways for climate policy cooperation.

At the local level, climate action within cities is equally shaped by historical dynamics. Yet, inadequate infrastructure, limited access to public services, and profound socioeconomic inequalities exacerbate the vulnerability of specific groups, leaving them disproportionately exposed to the impacts of climate change.

The fight for climate justice seeks an equitable distribution of environmental benefits and burdens, acknowledging that climate change disproportionately affects marginalized communities. However, we observe that climate justice remains far from being effectively achieved in many regions—particularly in developing nations, low-income urban areas, and Indigenous and quilombola communities. In these contexts, the lack of infrastructure, resources, and political representation exacerbates vulnerability to environmental disasters and hinders the implementation of effective adaptation and mitigation policies.

It is within this context that this document seeks to map and systematize these lived challenges, identifying the barriers that constrain the scaling of climate solutions, while also outlining pathways toward more equitable,

sustained, and locally-grounded financing. In doing so, it ensures that investments reach, in a direct and structural manner, the organizations already building concrete responses to the climate crisis.

Objectives

Our primary goal is to accelerate the transition toward more equitable, resilient, and sustainable cities by connecting marginalized communities' initiatives with investors committed to socio-environmental impact. Through this document, we aim to strengthen alternative funding mechanisms and methodologies that support Nature-based Solutions (NbS) led by leaders in vulnerable territories, ensuring that financial resources reach those who already protect, manage and sustain their communities.

We seek to transform the logic of resource access by valuing community knowledge and practices, ensuring that climate adaptation is built to be inclusive, territorially grounded, and guided by principles of climate justice and racial equity.

Specific objectives include identifying and mapping initiatives active in this agenda, systematizing these cases, and organizing them into a national reference portfolio. This material will amplify the visibility of these solutions and the leadership behind them, highlighting challenges, lessons learned, and investment opportunities. Furthermore, it will also serve as a practical guide for funders, philanthropic foundations, and public authorities to rethink the design of calls for proposals, making them truly democratic and responsive to the realities of vulnerable communities.

Nature-Based Solutions

According to the International Union for Conservation of Nature (IUCN), Nature-Based Solutions (NbS) are "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits."

Nature-based Solutions deliver simultaneous social, environmental, and economic benefits. The conservation of urban green spaces, such as parks, offers a practical illustration of these integrated outcomes: by providing areas for recreation and physical activity, these spaces contribute to both mental and physical health. Furthermore, they stimulate local economic activity through tourism and small-scale commerce, creating opportunities for local trade. In addition, green spaces mitigate the urban heat island effect and help remove atmospheric pollutants.

However, NbS should be understood as part of a broader ecosystem of strategies, which includes Ecosystem-based Adaptation (EbA), Ecosystem-based Management (EBM), Ecosystem-based Disaster Risk Reduction (Eco-DRR), and Green Infrastructure. EbA relies on nature-based approaches and ecosystem services—such as preserving coastal areas like mangroves, which act as natural flood defenses, and reforestation initiatives to combat desertification.

Ecosystem-based Management (EBM) is grounded in the understanding that sustainability is only achievable when human and ecological well-being are addressed in tandem, as humans are integral components of ecosystems. Forest management in the Amazon Basin, which curbs deforestation while ensuring sustainable land use, illustrates this approach by protecting vital carbon sinks while supporting local livelihoods.

Ecosystem-based Disaster Risk Reduction (Eco-DRR) refers to the protection, restoration, and sustainable management of ecosystems to harness the "free

services" provided by nature and reduce disaster risk. Unlike conventional management approaches, Eco-DRR is rooted in ecosystem services and human practices, further contributing to more effective post-disaster recovery. A key example is the conservation of hillside vegetation to reduce landslide risk by stabilizing soil, as seen in the Guarino River Basin in Colombia.

Green Infrastructure consists of multifunctional and interconnected networks of green areas and open spaces. Its purpose is to preserve ecological functions—such as vegetation and canopy cover—while safeguarding the natural and cultural dimensions of urban life. These interventions typically feature low environmental impact and are inherently adaptable to both present and future human and ecological needs.

Scaling Nature-Based Solutions requires their systematic integration into urban policies and development plans. Although municipal governance often involves complex bureaucratic structures and fragmented planning agencies, there are practical examples of coordination that overcome these barriers. In Barcelona, the establishment of an urban ecology authority proved instrumental in aligning municipal departments with the city's environmental and climate objectives. By consistently demonstrating the relevance and effectiveness of NbS, cities create a compelling signal to attract private and public funding for targeted climate adaptation initiatives.

Climate Adaptation And Its Link To Nature-Based Solutions (Nbs)

According to the Intergovernmental Panel on Climate Change (IPCC), adaptation refers to the process through which natural and human systems adjust to the impacts of climate change, both in the present and future. In human systems, adaptation aims to mitigate risks and damages while capturing potential opportunities. In natural systems, it may involve targeted interventions that support ecosystems in adjusting to changing climatic conditions (IPCC, 2023).

Climate adaptation is directly linked to disaster risk management and the strengthening of social and environmental resilience. It enables individuals and communities to better prepare for climate impacts, reducing harm while leveraging emerging opportunities in an era of accelerating change.

Adaptive capacity is essential to climate resilience. The IPCC (2014) identifies several key dimensions, including human resources (education, skills, and innovation capacity); institutional resources (public policies, health systems, and social protection networks); economic resources (funding, financial infrastructure, and market access); natural resources (access to water, land, and biodiversity); technology (access to advanced tools that enhance climate management and adaptation); and social cohesion (robust community networks that foster cooperation and collective action).

As previously discussed, Nature-based Solutions (NbS) represent a critical approach to climate adaptation, placing ecosystems at the core of climate strategy. They can be implemented across multiple scales, from individual streets and neighborhoods to entire urban centers. In these contexts, practical examples include:

Green roofs, which help reduce flooding and lower temperatures both inside buildings and in surrounding streets, particularly during heatwaves;

Community gardens, which give social function to vacant land while promoting food security, income generation, and community resilience;

The restoration of native vegetation on hillsides, which stabilizes soils and reduces erosion and landslide risks;

Linear parks, which form continuous green corridors along rivers, streams, and streets, contributing to natural water drainage and retention, while expanding green spaces.

The Brazilian Context And Perspectives On Adaptation

In Brazil, discussions on climate change adaptation have gained new momentum with the emergence of the concept of "antiracist climate adaptation". Developed collectively in 2024 by nearly fifty organizations in Olinda (Pernambuco) in 2024 and subsequently presented on the "Brasil Participativo" platform, this concept responds to the urgent need to place the most vulnerable populations—Black, Indigenous, Quilombola, marginalized, riverside, and traditional communities—at the core of climate decision-making processes.

Antiracist climate adaptation recognizes that addressing the climate crisis requires confronting racial, gender, generational, social, regional, and territorial inequalities. It proposes a structural transformation grounded in intersectional and cross-sectoral public policies focused on collective well-being, the protection of vulnerable groups, and the conservation of biomes, effectively bridging the gap between urgent action and long-term strategy.

This perspective challenges the presumed neutrality of traditional environmental policies. It advocates for the inclusion of popular, ancestral, and community-based knowledge at every stage of climate adaptation—from design and financing to implementation and monitoring. By doing so, it exposes the historical absence of a racial justice perspective in climate agendas and proposes a new paradigm: Brazilian cities will only be truly resilient if they are also antiracist.

The "Rede por Adaptação Antirracista (Network for Antiracist Adaptation)", responsible for the development of this concept, emphasizes that this debate transcends terminology — it is a dispute over power and over life itself. As stated in its collective statement:

"With our concept of antiracist climate adaptation, we denounce the racism that deepens climate injustice and affirm the proposals we want for Brazilian cities." — Thaynah Gutierrez, Executive Secretary of the Network for Anti-Racist Adaptation

It is through this perspective that the territory of Rio de Janeiro state is examined, with its multiple and overlapping layers of vulnerability. Despite the challenges they face, communities across the region have been developing solutions to address climate change impacts in their daily lives. These initiatives—often referred to as Nature-Based Solutions (NbS)—seek to respond to social challenges while simultaneously protecting the environment.

This project emerges from the recognition that many of the individuals and collectives designing and implementing NbS in vulnerable territories face major barriers to accessing funding. Even when resources are obtained, sustaining these initiatives over the medium and long term remains a constant struggle, whether due to bureaucratic obstacles, limited technical support, or the disconnect between those who finance projects and those who live in the territories.

To speak of vulnerability is to speak of inequality. In Brazilian cities—particularly in the metropolitan region of Rio de Janeiro—the impacts of the climate crisis intersect with the open wounds of a deeply unequal country, dividing those who benefit from adequate infrastructure from those who must rely on community solidarity to survive each rainfall.

The Context In Rio De Janeiro State

The territory of Rio de Janeiro offers a stark illustration of the climate crisis and its contradictions: increasingly intense extreme events affecting populations with the least capacity to respond. Limited access to sanitation, healthcare, and green spaces turns risk into a daily reality, while the absence of urban planning and adaptation policies deepens the inequality between those who can protect themselves and those left to fend for themselves.

Between 2020 and 2023, extreme weather events—including floods, landslides, and storms—caused 140 deaths, 690 injuries, and affected more than 3 million people across the state. Material losses alone surpassed R$1.5 billion, according to data compiled by Casa Fluminense. These figures confirm what communities have asserted for decades: the climate emergency is, fundamentally, a social emergency.

"For a long time, environmental debates overlooked those most affected by their consequences." — Notícia Preta, online news outlet

In the metropolitan region, one out of every five households is located in high-flood-risk areas, while one in every hundred sits in landslide-prone zones. This represents more than 60,000 homes situated on vulnerable hillsides and approximately 1.1 million residences in flood-prone zones, the vast majority of which are concentrated in marginalized neighborhoods and the Baixada Fluminense.

In municipalities such as Magé, Duque de Caxias, and São Gonçalo, urbanization has expanded into fragile territories lacking proper infrastructure. In Petrópolis, where 12.3% of homes are located in risk zones, the city remains a symbol of tragedies that recur year after year.

Beyond these physical risks, more than half of the municipalities in the metropolitan region lack updated Civil Defense contingency plans, and only the state capital has a formal Climate Mitigation and Adaptation Plan. This lack of strategic planning exacerbates climate impacts, leaving responses consistently reactive rather than preventive.

"Climate vulnerability intersects with every basic right, from housing to health." — Leilane Reis, Greenpeace Brazil

Climate vulnerability has both a racial and territorial dimension. In Rio de Janeiro state, 1.8 million people lack access to the official water supply network, and 1.5 million do not have adequate sewage services. While 8% of white residents face this situation, among Black residents, the figure rises to 11%.

These inequalities directly impact public health. In 2022, Rio de Janeiro recorded 5,935 hospital admissions and 72 deaths from waterborne diseases, with costs exceeding R$ 5 million. In the metropolitan region—which accounted for 74% of these hospitalizations—84% of patients were Black. The municipality of Belford Roxo alone concentrated 57% of the cases. These figures demonstrate that sanitation and water access are not merely technical challenges but manifestations of environmental racism—an inequality produced and perpetuated by the very design of public policies.

Urban concrete dominates the territory. While the state maintains 30% forest cover, five municipalities in the metropolitan region have less than 10% green space. In São João de Meriti, green coverage is nonexistent; in Belford Roxo and Queimados, it reaches only 4%. This scarcity of vegetation intensifies urban heat islands and reduces natural drainage capacity, increasing flood risks. Environmental monitoring is also insufficient: between 2021 and 2022, INEA, the state environmental agency, conducted only 544 water collections statewide, and 69% of the analyses in the metropolitan region were classified as poor or very poor. These figures reveal that environmental degradation and urban inequality are two sides of the same crisis: where green space is lacking, vulnerability prevails.

The climate crisis is also overstretching the social protection system. According to the 2023 Inequality Map, the national average is 4,918 families per CRAS (Social Assistance Reference Center). In Rio de Janeiro state, this figure rises to 7,400, and in the metropolitan region it reaches 12,753 families per center. In 15 of the 22 municipalities, capacity has already been exceeded; in Duque de Caxias, Nova Iguaçu, and the city of Rio de Janeiro, the number of registered families is four times the recommended limit.

These data reveal the collapse of a social infrastructure fundamental to climate adaptation. Without care networks, resilience networks cannot exist. The evidence, alongside the voices from these territories, forms a clear picture: climate vulnerability in Rio de Janeiro is a direct outcome of urban and racial inequality. The impacts of rain, drought, or extreme heat are not random; they trace the same geography of exclusion.

"Community practices are, in themselves, concrete responses to the climate crisis, but they still lack a supportive ecosystem." — Walmyr Junior, Founder of Horta Maria Angu

Despite these systemic failures, communities continue to pioneer solutions. Community gardens, grassroots reforestation initiatives, and urban solidarity networks demonstrate that Nature-based Solutions (NbS) are already a reality in marginalized territories. What remains lacking is for financing mechanisms and public policies to recognize and strengthen these initiatives as legitimate climate adaptation strategies.

"Marginalized territories are shaping the sustainable future that the world still fails to see." — Notícia Preta, online news outlet

Financing Mechanisms And Access Challenges

As discussed so far, Nature-based Solutions (NbS) deliver adaptation benefits while improving living conditions for social groups frequently affected by environmental racism and socioeconomic inequality, such as favelas and other marginalized communities. They represent a key tool for reducing vulnerabilities in these territories; however, for these solutions to be strengthened and implemented at scale, dedicated investment is required.

Climate finance—particularly funding directed toward adaptation—refers to resources allocated to support communities in mitigating the risks and damages associated with climate hazards. These resources are essential to strengthen housing and infrastructure against extreme events; to develop drought-resilient agricultural practices; establish social protection mechanisms (such as cash transfers, food assistance, or insurance schemes for post-disaster recovery); and to improve access to climate information for more effective risk management.

A resource is classified as adaptation finance when its explicit intent is to increase resilience to real or projected climate risks. For instance, the construction of a new road must serve to enhance community resilience—particularly in vulnerable settlements—by ensuring access to hospitals, markets, and emergency assistance during extreme extreme events, such as floods.

At the global level, adaptation finance encompasses a wide range of funding sources, including transfers from developed to developing countries; public funding allocated by national governments to strengthen domestic resilience; and private actors such as philanthropic foundations, corporations, and financial institutions.

Despite this diversity of available sources—both national and international—a persistent gap remains between the existence of these resources and access for those who need them most. While private companies increasingly invest in adaptation to protect their operations, supply chains, and markets, many

grassroots organizations and social movements on the front lines of climate impacts remain sidelined. These groups, often the ones implementing Nature-based Solutions (NbS) for adaptation, find themselves unable to access existing financing mechanisms.

The main barriers in this process include the requirement for formal institutional structures and a profound disconnect between grassroots organizations and major financing actors. Brazil's legal and accounting frameworks, combined with the way financial flows have been structured, tend to favor large, established organizations with formal registration, limiting access for smaller, community-led initiatives.

International funding is particularly restrictive; community organizations and small collectives are rarely able to access these resources directly. Funds typically enter the country through intermediaries that issue highly formal calls for proposals or impose requirements that ultimately exclude underserved territories, thereby perpetuating socioenvironmental inequalities.

For vulnerable communities to respond more effectively to climate change, access to financing must be simplified and de-bureaucratized. Resources need to reach these communities directly, rather than remaining concentrated in large-scale projects. Philanthropy has the potential to play a key role in this process by democratizing access to funding and supporting climate adaptation and ecological transformation directly within territories.

In the Brazilian context, one approach to overcoming these barriers has been the emergence of "re-granting" organizations. These entities mobilize international resources and redistribute them to smaller, community-based initiatives responsible for frontline territorial action. It is crucial, however, that these organizations charge fair service fees, avoiding disproportionate deductions from funds that are intended to support local initiatives.

A further strategy involves the creation of targeted training and capacity-building programs focused on financial literacy and project management. These initiatives can provide essential guidance on fundraising, cultivating relationships with funders, developing project proposals, and ensuring financial accountability, alongside technical support for the institutional strengthening of grassroots organizations.

The PIPA study (2022) also proposes a series of actions to improve financing systems. These include fostering greater diversity within organizational teams and boards to prevent funding decisions from being restricted to exclusive "trust networks" and ensuring that philanthropy reflects a broader range of realities in decision-making spaces. The study further highlights the importance of portfolio transparency to reveal how resources are allocated and to expose the limited participation of community organizations in the main circuits where financial capital circulates. Another key recommendation is institutional strengthening, which aims not only to fund project activities but also to support the people and structures responsible for implementing these initiatives.

Addressing climate change effectively requires greater ambition and faster transfers of funding to the regions that need it most, ensuring the continuity and expansion of Nature-based Solutions (NbS) and other locally developed initiatives.

As part of this research, interviews were conducted with three Brazilian organizations representing distinct sectors and perspectives on financing: Greenpeace Brazil, a global organization working on climate justice; Regenera Rio Grande do Sul, a philanthropic fund; and Horta Maria Angu, a low-income community initiative that implements Nature-based Solutions.

Based on these dialogues, we identified an urgent need to build a new financing model—one that validates and scales solutions already being implemented within territories, rather than imposing predetermined agendas driven by the priorities of external funding institutions. Operating at the local level, Horta Maria Angu, for example, has an in-depth understanding of the community's needs and the specific conditions that effective, locally-grounded solutions must address. Despite this expertise, the organization continues to face substantial barriers in accessing philanthropic funding.

Many initiatives like Horta Mari Angu rely on small-scale grants or occasional donations, unable to access larger resources due to bureaucratic procedures and technical requirements that are incompatible with their operational context. For this reason, Greenpeace Brazil representatives reaffirmed the importance of incorporating financing structures that effectively sustain the field, anchored in the daily demands and practices of grassroots organizations.

Creating spaces for training and exchange between funders and community leaders helps bridge structural inequalities related to access and communication. Such initiatives strengthen knowledge networks and foster relationships among key stakeholders, while also improving the understanding of financing processes and the language used in these spaces, often referred to as social capital.

In this sense, we emphasize the need for a fundamental transformation on both sides of the financial structure. This transformation requires financing models to be reconfigured so that they account for vulnerable local realities, reduce bureaucratic barriers to accessing resources, and expand capacity-building opportunities for grassroots organizations.

Conclusion

As this report has demonstrated, marginalized communities are already generating innovative initiatives that actively confront the climate crisis and strengthen adaptation. Yet these communities continue to encounter bureaucratic barriers and structural constraints that limit their access to vital funding.

Rather than merely mapping these obstacles, this report seeks to highlight pathways toward the democratization of funding, enabling grassroots institutions, organizations, and collectives to effectively access the resources necessary to advance their work.

We believe that shedding light on these dynamics is a critical step toward fostering a more robust dialogue with funders, Brazilian philanthropic foundations, and public authorities. By aligning financial strategies with the lived realities of these territories, financial mobilization can become more inclusive and effective, ensuring that Nature-based Solutions (NbS) can scale across vulnerable communities throughout Brazil.

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