LAC Cities Study Tour, Sector Notes
Drawing insights from latin america: Four decades of neighborhood (slums) upgrading programs

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Disclaimer

This document was prepared as part of the series of sector notes that highlight the characteristics of the urban infrastructure sector, the roles of the private and public sector, and the financing mechanisms for the long-term funding of these urban interventions. The notes are prepared as background material for the Latin American and the Caribbean (LAC) Cities Study Tour offered to African Cities in the UMDF Cities Program. The sector note also highlights the experiences of the LAC region in finding solutions for the urban challenges as well as the lessons learned. This note was prepared by Authors Cynthia Goythia and Milagros Barchi, from the Urban Development Research Center at the Torcuato Di Tella University in Buenos Aires Argentina under the supervision of Ellis J. Juan, senior advisor to the UMDF[1].

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1 Drawing Insights from Latin America: Four Decades of Neighborhood (Slums) Upgrading Programs Centro de Investigación de Política Urbana y Vivienda/ Centro de Evaluación de Políticas Basadas en la Evidencia, Universidad Torcuato Di Tella

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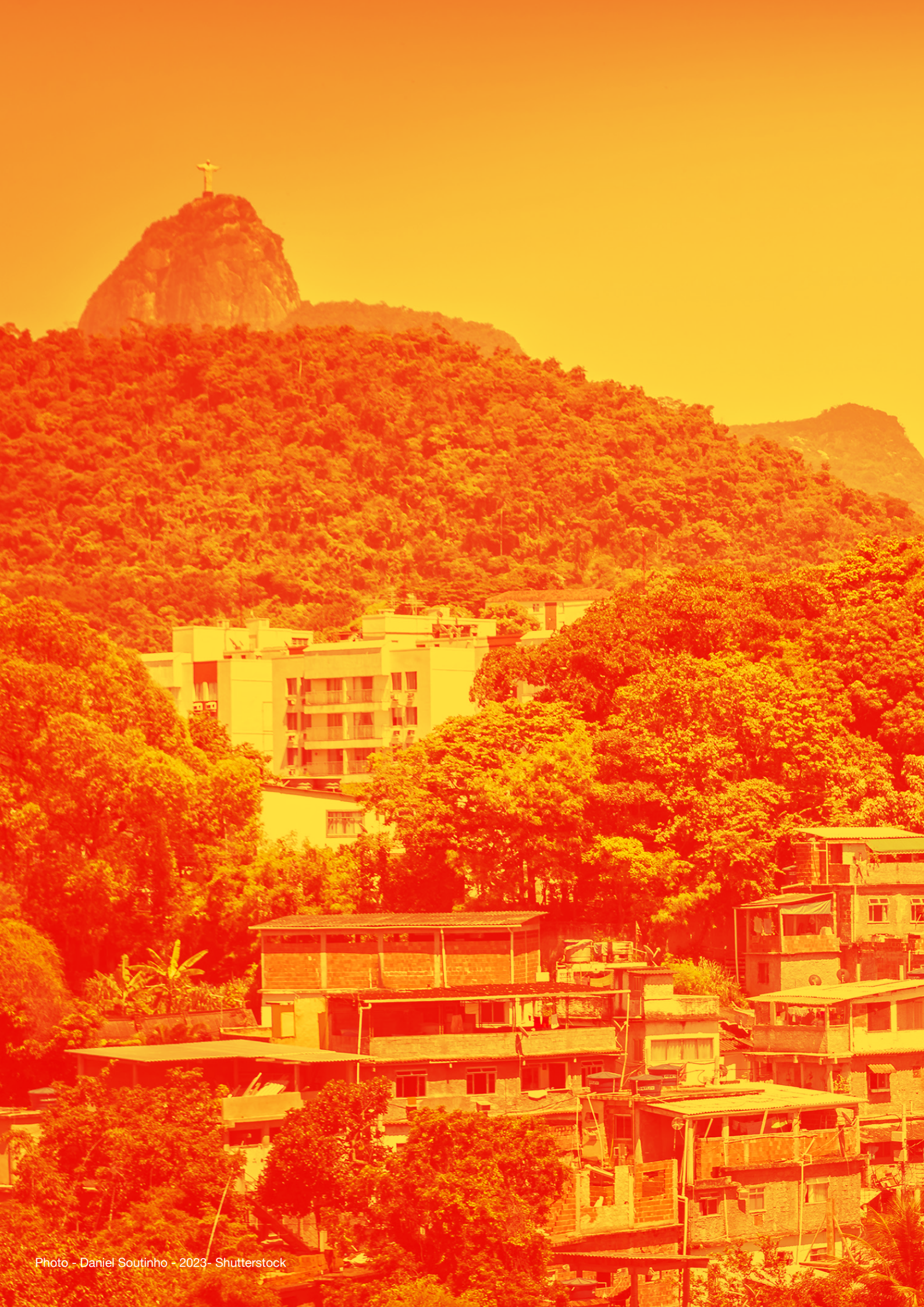

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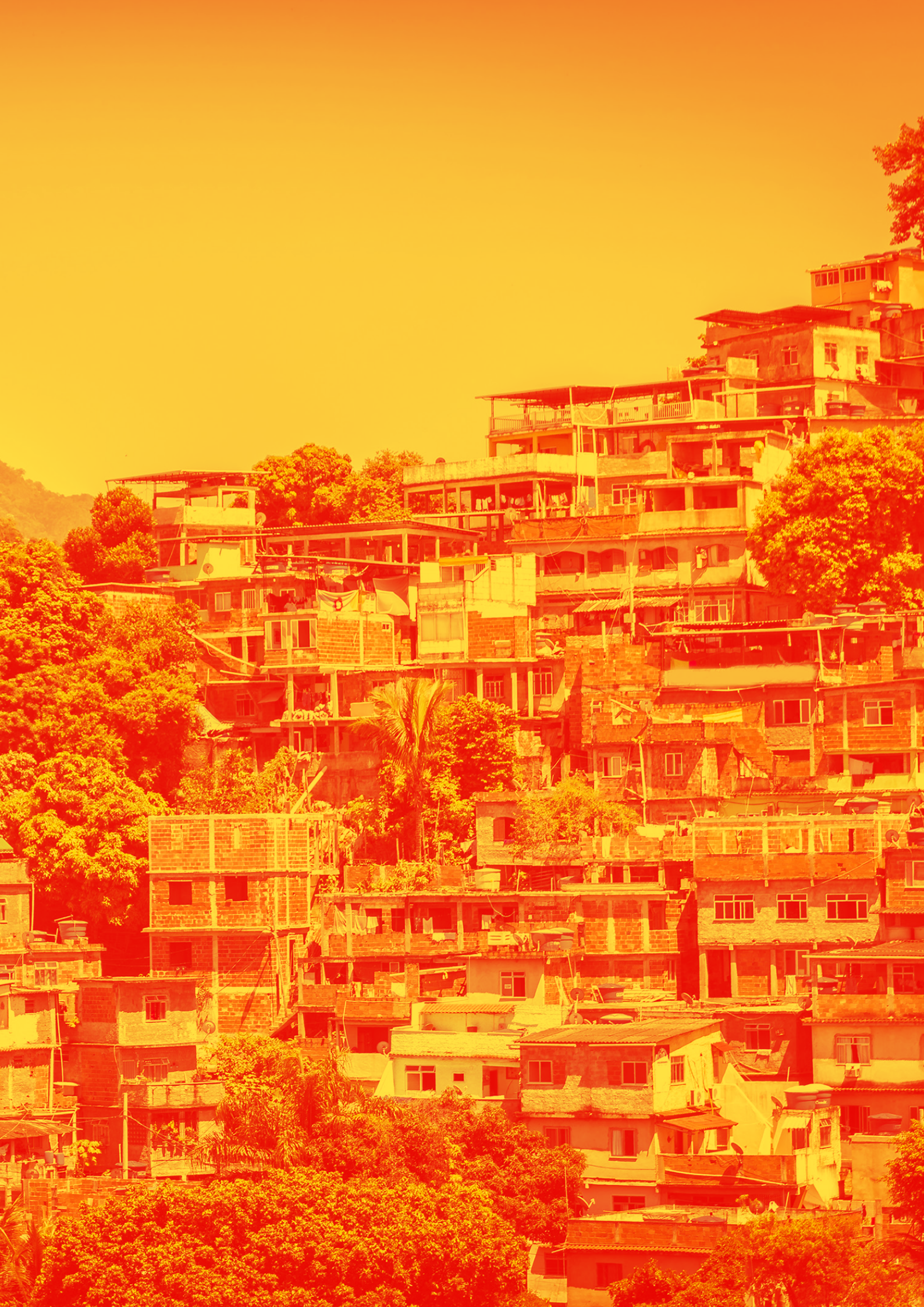

Summary

Informal settlements present a significant challenge to African cities, with over 200 million people living in precarious conditions. To tackle this issue, this paper draws on valuable experiences and insights gained from Latin American countries, which have faced similar challenges with varying degrees of success.

The first section of the paper outlines the pressing need for comprehensive urban integration and development strategies. It highlights the multifaceted challenges faced by informal settlements in Latin America, providing an in-depth understanding of the depth and complexity of the issue at hand. Moving forward, the section on “Experiences from Latin American Cities” showcases successful Neighborhood Upgrading Programs (PMBs). These programs have not only improved living conditions but also effectively tackled informal settlements, serving as inspirational models for African cities seeking sustainable solutions. The paper also provides insights from these successful programs in Latin America, which can be applied to similar challenges in African cities. Subsequent sections delve into critical dimensions, such as the economics of informal settlements, financing structures for upgrading programs, and the role of the private sector in housing provision. Throughout the final section, emphasis is placed on the importance of proactive policies over-reactive interventions. By prioritizing preventive measures, cities can mitigate the adverse impacts of informal settlements and foster long-term resilience against environmental adversities. Concerning this, the section addresses new challenges about climate change, green infrastructure, energy efficiency, and water consumption in informal settlements.

In conclusion, this paper offers actionable recommendations and strategies to support sustainable Neighborhood Upgrading Program efforts. By leveraging the experiences and lessons learned from Latin America, it aims to cultivate innovative approaches and collaborative partnerships to create resilient and inclusive cities across the Global South.

Introduction

This section presents an overview of the challenges of informal settlements in Latin America and the Caribbean (LAC). It explains why experiences from Latin American cities are relevant and the rationale for considering their practices for African cities.

Over recent decades, the urban landscape in Latin America and the Caribbean (LAC) has undergone a profound transformation. The percentage of the population residing in urban areas has experienced a substantial increase, rising from 41.3% in 1950 to 81.2% in 2020 (Buchholz, 2020). However, this rapid urbanization has brought about a set of challenges, notably reflected in the prevalence of informal settlements. Within the region, approximately 24% of the urban population finds residence in these areas (Moreno et al., 2017), amounting to 104,8 million individuals living in precarious housing conditions (Sandoval & Sarmiento, 2018). Furthermore, a staggering 120 million people across LAC grapple with the harsh reality of living without access to basic services in urban areas, underscoring the pressing need for comprehensive and sustainable urban development strategies (World Bank, 2020).

The region stands as the second most urbanized globally, following North America and surpassing even European urbanization levels. The rapid urbanization of Latin America since the mid-20th century can be attributed to post-war industrialization policies. This transformation was spurred by increased natural resource prices and advancements in healthcare, leading to a reduced mortality rate and an increase in natural population growth. Despite a belated initiation, urbanization in the region outpaced that of developed countries, driven predominantly by rural-to-urban migration in pursuit of the opportunities that can be found in these cities (Daude et. al, 2017). Between 1950 and 1990, urbanization peaked at an annual rate of 5%, reaching 70% of the population. However, since the 1990s, the pace has slowed to under 2% annually (Magalhães et al., 2016). Notably, by attracting low-income rural households that migrate in search of better opportunities, cities also make poverty and inequality more visible. The growth of cities has been associated with the creation of informal settlements and poverty belts characterized by limited access to public services and precarious property rights. The persistent gap between demand and supply for serviced land poses a challenge to financing affordable housing for lower-income groups (Magalhães et al., 2016). Additionally, the absence of an effective land policy has hindered the development of low-cost housing, rendering it either unaffordable or inconveniently located for the poor. In this context, cities remain strongly segregated, serving as a stark reflection of enduring inequality and poverty.

The challenges posed by informality represent some of the most pressing issues across Latin America. Informal settlements are located in areas with limited accessibility and harsh environmental conditions, resulting in significant health implications. These settlements often lack adequate coverage, investment, and maintenance of infrastructure, leading to heightened levels of risk. Additionally, families residing in these areas face numerous constraints, such as limited access to education, healthcare facilities, services, and employment opportunities. They are also faced with rights violations, including different forms of discrimination (especially among poor migrants), precarious and informal employment, challenges in accessing justice, and instances of abuse, coercion, and violence (Fernandes, 2011).

The emergence and evolution of informal settlements in Latin America exhibit diverse characteristics in terms of their origin, precariousness, and habitability conditions, and follow various processes linked to the socio-political and institutional nuances of different countries. However, they can be broadly characterized by two primary forms of non-compliance. Firstly, there are issues related to property rights and the absence of legal titles for occupied land or property. Secondly, there are challenges associated with urbanization processes that disregard norms governing land subdivision and city construction (Brakarz et al., 2002). Furthermore, there are diverse manifestations of informality, with the most prevalent in Latin America falling into two categories. Firstly, some settlements arise from the occupation of public, communal, and/or private land, showcasing various forms of possession, whether organized or individual. These settlements go by different names, such as favelas in Brazil, campamentos or callampas in Chile, villas miseria/emergencia in Argentina, pueblos jóvenes in Peru, and asentamientos or cantegriles in Uruguay, among others. The second significant group comprises neighborhoods resulting from an organized process occurring outside existing regulations, where landowners or "promoters" develop the land, plan, and physically subdivide the plots for sale. Similar to the previous case, the construction process and subsequent urban consolidation are self-managed at an individual level. These are often referred to as irregular subdivisions or clandestine urbanizations, which are common in countries such as Peru. Other variations include the urbanization and development of areas defined as rural, the occupation of environmentally hazardous areas, or challenging terrains such as riverbanks, water reservoirs, mountainsides, among others (Magalhães et al., 2016).

The relevance of Latin American experiences to Africa is underscored by several compelling factors. Firstly, both regions share a common historical and socioeconomic context shaped by the legacy of colonialism, rapid urbanization, poverty, and inequality. This shared backdrop provides a valuable framework for comprehending the challenges and opportunities associated with informal settlements. Secondly, Latin American cities have been at the forefront of innovation and experimentation in addressing informal settlements, especially in the implementation of Neighborhood Upgrading Programs (known as PMBs in Spanish). Cities have successfully implemented various progressive approaches, such as participatory planning, integral upgrading programs, and social housing initiatives. These innovative practices serve as valuable examples for African cities, offering insights that can be learned from and adapted to suit their unique contexts. Furthermore, Latin American cities have begun to prioritize investments in data and research on informal settlements, laying the groundwork for evidence-based approaches. This robust information can play a crucial role in informing policy decisions in African cities, providing a solid basis for the development and implementation of effective strategies to address the challenges posed by informal settlements.

Experience from Latin American cities: Key initiatives and experiences regarding informal settlements.

Over the past four decades, Latin American cities have successfully implemented a range of policies and initiatives to tackle informal settlements. Neighborhood Upgrading Programs (PMBs), initially experimental, were designed to improve living conditions in these settlements. By the mid-90s, these initiatives expanded across the continent and became integral parts of housing policies. This shift resulted from gradual changes in public policies and the influence of multilateral finance institutions, including the Inter-American Development Bank and the World Bank. While each country has tailored these programs to its unique context, they share common traits and objectives. These include the integration of formal and informal city sectors, ensuring household access to infrastructure, basic urban services, and amenities. Additionally, objectives encompass land tenure regularization, active community participation in the design, execution, and implementation processes, and the strengthening of social capital and collective organization. For instance, social services are tailored to meet the specific needs of each community. As a result, these programs advocate for the socio-territorial integration of families within the rest of the city. This stands in contrast to previous interventions that were solely focused on land tenure regularization and the provision of basic infrastructure and urban services. More recently, economic development has been included as a central element in this type of more integral urbanization and regularization interventions. The latter approach lacked accompanying urban, environmental, or social improvement actions to address the most urgent social needs. Therefore, the evolution of these programs reflects a comprehensive strategy for enhancing living conditions and fostering sustainable urban development.

Argentina

In Argentina, urban development initiatives have undergone testing since the 1970s, gaining momentum in 1986 with the initiation of the Neighbourhood Improvement Program (PROMEBA). Continuously supported since 2007 by the Inter-American Development Bank (IADB), this large-scale program has witnessed four distinct stages over the past two decades. The execution of these stages has resulted in the implementation of 149,632 basic solutions and urbanized lots, positively impacting around 600,000 families. PROMEBA's influence in the country has been complemented by additional public sector initiatives such as the Rosario Habitat Program, the Villas and Settlements Subprogram of the Federal Housing Program, and numerous provincial and local programs focusing on neighborhood intervention. In the latter, PROMEBA's methodology emphasized fieldwork, multidisciplinary, and integration approaches, with substantial resident participation. It also supports well-prepared and guided execution units in each state, to carry on one of the most difficult tasks of these interventions: appropriate design and effective implementation and coordination of different sector's activities.

Currently, the Inter-American Development Bank is actively engaged in implementing several initiatives, including (i) the Urban Integration and Social and Educational Inclusion Program in the Autonomous City of Buenos Aires, specifically targeting Barrio Mugica, benefiting over 40,000 people (approximately 12,000 households) across 72 hectares; (ii) the Social and Urban Integration Program managed by the Ministry of Social Development of the Nation; and (iii) the Social and Urban Integration Program in the Province of Buenos Aires, which, in its initial stage, aims to impact around 24,000 people in various municipalities within the Metropolitan Area of Buenos Aires.

Case study 01: Barrio Padre Carlos Mugica (CABA)

Background: Barrio Padre Carlos Mugica, formerly known as Villa 31, stands as a high-density informal settlement strategically located in Comuna 1 of the City of Buenos Aires, close to the financial center and affluent neighborhoods. At the initiation of the social integration project, approximately 40,200 people were estimated to reside in over 12,600 houses. Despite its central location, the neighborhood faced a deficit in basic infrastructure, characterized by informal connections to essential services, limited public spaces, and accessibility challenges. Within the context of the Buenos Aires Metropolitan Area (AMBA), one of the most densely populated urban agglomerations in Latin America, Barrio Mugica presented unique socio-economic challenges. Vulnerability was pronounced, with residents experiencing precarious living conditions and limited access to formal employment and education.

Intervention: In 2016, recognizing the imperative for transformative change, the Secretariat for Social and Urban Integration was established under the Chief of Staff of the Government of the City of Buenos Aires. The mission was clear: implement a comprehensive social and economic integration program to elevate the living standards and capabilities of Barrio Padre Carlos Mugica's residents and foster seamless integration within the broader urban landscape. Guided by Decree 363/16, the Secretariat embarked on a re-urbanization mission, aligning with Act 6129 (2018) and Law 3343 (2009). Collaboration with the International Bank for Reconstruction and Development (IBRD) resulted in the signing of loan N°8706-AR, fuelling the Urban Transformation Project of the Buenos Aires Metropolitan Area (AMBA). A Comprehensive Action Plan, focusing on four key pillars—Urban Integration, Habitat and Housing, Economic Development, and Human Development—served as the blueprint for change.

Components and Results: Urban Integration: The physical integration of Barrio Mugica into the surrounding areas of Buenos Aires was pivotal for its revitalization. Streets were opened, bus entrances were enhanced, and cycling and soft transit routes were introduced to improve connectivity. The participatory naming of streets engaged over 4,700 residents, fostering a sense of community identity. Public spaces were upgraded, contributing to a 365% increase in space per resident. The Ministry of Education's strategic relocation further strengthened the bond between the city and the neighborhood.

Habitat and Housing: The Housing Improvement Program addressed the inadequate living conditions of approximately 12,000 houses. Interior and exterior upgrades, along with water and sanitation improvements, aimed at creating safer and more habitable spaces. Energy efficiency initiatives, including formalizing connections to the power grid, were introduced. New social housing projects underpinned by sustainable practices and renewable energy marked a significant step towards addressing housing challenges, by providing over 30 new buildings and 1,210 new units.

Economic Development: A nuanced understanding of the local economic landscape was gained through the "Economic Activity in Barrio 31" survey. Personal services and commerce dominated economic activities, with a focus on informal enterprises. The Centre for Entrepreneurial and Labour Development (CeDEL) played a pivotal role in offering a spectrum of services, from training to labor integration programs. Market formalization, commercial street regeneration, and integration of market-leading companies revitalized economic circuits, creating new employment opportunities.

Human Development: Community participation, enshrined in City Law 6129, was a cornerstone of Barrio Mugica's urban integration. Monthly advisory meetings, thematic roundtables, and working group gatherings facilitated dialogue and engagement. Access to urbanization information was streamlined through dedicated local teams. Educational opportunities were expanded through the establishment of a new nursery school and a professional training center, addressing the educational gaps in the community. The creation of new spaces, including a health center, focused on bridging the healthcare gap and integrating digital medical records for efficient care.

Case study 02: PROMEBA (Nationwide)

Background: As of 2020, Argentina faces a housing deficit of 3.62 million households, constituting 38.8% of the total housing deficit. Villas, Settlements, and Degraded Areas account for 61.6% (2,230,147 households), characterized by qualitative deficits such as housing quality issues (63%) and situations of overcrowding (3.5%) or lack of access to basic services (33.4%). In this context, the Neighbourhood Improvement Program (PROMEBA), represents a successful model for comprehensive and cross-cutting intervention in territories that have supported Argentine cities in improving Villas, Settlements, and Degraded Areas, addressing growing gaps in access to adequate housing and quality urban services. PROMEBA IV has a total financing of US$222 million, with US$200 million from IDB and US$22 million from the local counterpart.

Objectives: The general objectives of this program are to sustainably improve the habitat of households residing in villas, settlements, and degraded areas in the country. Additionally, the program aims to enhance the effectiveness of interventions, particularly focusing on climate resilience, gender, and diversity. It also seeks to build capacities to prevent the formation of new Barrios Populares (informal settlements) and precarious areas. Specific objectives include increasing land tenure security, enhancing the quality of life for residents in each intervened area, strengthening grassroots community organizations, and improving the performance of the executing teams.

Components (PROMEBA IV): i. Component 1: Land Tenure Legalization, focuses on legalizing land tenure by conducting studies and processes for physical regularization, ensuring the transfer of land ownership to beneficiaries. It involves legal and physical regularization activities, acquisition of relocation plots, and providing legal instruments for secure land tenure; ii. Component 2: Infrastructure, Equipment, and Environmental Sanitation Provision, implement

urban basic services infrastructure in eligible neighborhoods, including detailed project formulation and execution of comprehensive projects covering various urban infrastructure aspects; iii. Component 3: Community Development, aims to strengthen community organizations, involving multidisciplinary field teams, participatory workshops, training, legal formalization assistance, and support for community initiatives; Component 4: Program Management Capacity Strengthening, provides technical assistance for training and strengthening units in technical and fiduciary processes related to urbanization projects; v. Component 5: COVID-19 Response in Informal Settlements, aims to ensure the well-being of residents in response to COVID-19, covering various aspects such as community leadership strengthening, hygiene, connectivity, employment generation, and housing improvement. The component includes consultancy services for on-site supervision. The Ministry of Territorial Development and Habitat, through the Secretariat of Habitat and the Secretariat of Coordination, acts as the Executing Entity, handling technical and fiduciary-administrative aspects, respectively.

Results: Previous phases have been successful, regularizing neighborhoods and homes, providing basic infrastructure, and promoting community development. Positive impacts include a reduction in school absenteeism, increased participation in community activities by female heads of households, and improvements in the qualitative housing deficit. The program has targeted more than 100 neighborhoods and precarious areas over a span of 25 years. The estimated impact of PROMEBA I to IV is 43,057 families/units in 626 interventions (573 completed, 51 in progress, and 2 in the bidding process). The program has contributed to reducing the qualitative housing deficit, improving resilience, reducing overcrowding, and promoting intra-household inv geted intervention in the most deprived urban areas of the country.

Brazil

Since the late 1970s, Brazil has implemented a plethora of national, state, and municipal programs—over 100 in total (excluding strictly sectoral initiatives like water and sanitation, road infrastructure, etc.). Initially, national programs took the lead, but spurred by popular movements, the first regularization experiences emerged at the local level in cities like Belo Horizonte, Diadema, Santos, Natal, Rio de Janeiro, and Sao Paulo. By the late 1980s, Recife's upgrading program introduced the concept of Special Zones of Social Interest (ZEIS), which subsequently wielded significant influence across Latin America. In 2001, Law 10.257, commonly known as the City Statute, incorporated the ZEIS concept and established a comprehensive toolkit aimed at enhancing land management and bolstering the effectiveness of neighborhood improvement and regularization programs. Among the myriad interventions in Brazil, the most noteworthy has been the Favela Bairro - Morar Carioca Program, partially funded by the IADB. Spanning four phases, this program has positively impacted approximately 600,000 people in Rio de Janeiro.

Case study 03: Favela Bairro (Rio de Janeiro)

Background: The Favela Bairro program, initiated in 1996 by the Municipal Government of Rio de Janeiro, in collaboration with the Inter-American Development Bank (IADB), stands as a notable slum upgrading initiative in Brazil. With a multifaceted approach, the program aimed to integrate existing slums into the urban fabric, prevent land invasions, and provide low-cost housing opportunities. Financial and technical support from the IADB facilitated its implementation, making it a model for other local governments. The program, spanning three phases and benefiting 137,000 households across 138 settlements, involved infrastructure upgrading, regulatory changes, and community engagement.

Intervention: Between 1995 and 2018, the IDB provided loans for a total of US$450 million during the three stages of the program. The municipality of Rio de Janeiro provided an equal amount, for a total budget of US$900 million in nominal terms.

First Phase (1996-2000): The initial focus was on infrastructure, encompassing water supply, sewerage, waste collection, drainage, lighting, and housing construction. Small economic components included support for local commerce and community development. The lack of provisions for cost recovery from beneficiaries ensured community engagement without financial burden.

Second Phase (2000 - 2011): Expanded to 18 new areas, this phase introduced social services for vulnerable groups and vocational training. Residents gained land-use rights, providing security of tenure. Building and land use standards adapted to local conditions were established, fostering a sense of ownership. The program evolved beyond physical upgrading, incorporating socio-economic development[1].

Third Phase (2011 Onwards): In addition to existing components, this phase focused on reducing violence, combating drug use, and improving job prospects, particularly for vulnerable families and youth.

Strengths: i. Simplicity and Reliability: The program's straightforward design and the municipality's commitment contributed to its efficiency; ii. One-Stop-Shop Model: Coordinated by the municipality, the program efficiently managed finances and engaged specialized departments for diverse needs, expanding from physical upgrading to holistic socio-economic development; iii. Multi-Stakeholder Collaboration: Involvement of professional associations, academia, and NGOs brought diverse expertise into the project, enhancing its effectiveness; iv. Community Participation: Actively engaging communities and local leaders in project design and implementation fostered dialogue, ensuring alignment with residents' realities.

Challenges: i. Missed Financial Participation: While communities and the private sector participated in service delivery, the model missed opportunities for financial participation by these stakeholders; ii. Dependence on Strong Municipal Government: The model's success hinges on a capable municipal government. Weak or politically dysfunctional administrations may struggle to implement it effectively; iii. Continuity Challenges: The program's sustainability relies on municipal government stability, posing challenges during political transitions; iv. Limited Success in Income Generation: Income generation activities faced challenges and required better design and support for professional training; v. Lack of Microfinance Support: Assistance for microfinance to support housing improvements and local businesses was lacking, hindering economic empowerment.

Evolution and Federal Initiatives: Recognizing limitations, the federal government introduced the Growth Acceleration Program (PAC) in 2007. PAC integrates socio-economic development and social inclusion, linking new housing to the federal "Minha Casa Minha Vida" program. This comprehensive approach addresses broader challenges and builds on the lessons learned from Favela Bairro.

1 Of the US$300 million invested in FB II, US$250 million was for direct costs of the program. The infrastructure upgrade cost US$211 million (or 70 percent of the whole FB II budget). Funding to assist children and adolescents was US$25.5 million. Funding for job training and income generation was US$9 million. Another component was for institutional strengthening, with a budget of US$4.5 million for monitoring and evaluation. The indirect costs included interest, credit fees, inspection, supervision, administration, and management support, which, combined, accounted for the rest (US$50 million) of the budget.

Case study 04: Bairro Maravilha (Rio de Janeiro)

Background: The Bairro Maravilha program was created to address the municipal responsibilities of Brazil, pertaining to urban management and sanitation infrastructure provision. In cities such as Rio de Janeiro, informal housing is often constructed without proper permits, leading to the establishment of favelas that are difficult to relocate. The increasing frequency and severity of extreme weather events, caused by climate change, emphasizes the need for proactive measures to safeguard both infrastructure and the well-being of the population. Therefore, the program aims to provide sufficient infrastructure in areas that are susceptible to flooding, particularly during the summer months, when heavy rainfall and flooding are prevalent due to the city's geography and climate.

Intervention/Objectives: The primary objective of the "Bairro Maravilha" program is to rehabilitate areas that have suffered from a lack of urban infrastructure in the past, particularly in the suburbs, by providing urbanization systems and infrastructure. The initiative aims to improve rainwater drainage to prevent floodings, basic sanitation, potable water supply, and road paving in 97 localities across the North and West zones of Rio de Janeiro. With an investment exceeding R$ 981 million, the program seeks to enhance the quality of life for residents by revitalizing streets, roads, and avenues, ultimately benefiting approximately 300,000 inhabitants.

Results and Challenges: Noteworthy achievements of the program include the re-urbanization of roads, streets, and avenues, with investments exceeding R$ 716 million in the West Zone alone, benefiting around 300,000 residents across 82 different localities. The program aims to revitalize nearly a thousand streets, covering a total area of 1.5 million square meters and urbanizing approximately 300 kilometers of roads. Notable areas such as Santa Cruz, Campo Grande, and Bangu are leading in investment. The program's success is attributed to its emphasis on direct community involvement in urban infrastructure projects, making it a replicable and successful case in responsible urban development. Despite these advancements, challenges such as coordinating with residents for direct participation in project execution and managing resources sustainably persist.

Case study 05: Barrio Novo do Caximba (Curitiba)

Background: Curitiba, a pioneering city in sustainability, continues to refine and expand its innovative practices, with a notable initiative being the "Bairro Novo do Caximba" project. Launched in October 2022, this project goes beyond waste management, targeting improvements in energy efficiency and electric mobility. Serving as a model for sustainable urban development in Brazil, the initiative showcases Curitiba's commitment to progressive environmental solutions. However, south of Curitiba, the Caximba community faces substantial challenges. Once a landfill receiving waste from the region, Caximba transformed into 'Vila 29 de Outubro,' the largest settlement in the area. Characterized by irregular housing on flooded land without basic sanitation, over 1.1 thousand families reside in precarious conditions, highlighting the urgent need for intervention.

Intervention/Objective: In response to the complex socio-environmental challenges in Caximba, the "Projeto do Bairro Novo da Caximba" aims to urbanize the area, focusing on environmental recovery and land regularization. Launched as the largest socio-environmental intervention in recent Curitiba history and Brazil's first smart neighborhood, the project includes resettlement areas, a linear park, an ecological corridor, and new public facilities. This initiative is particularly crucial as the Caximba community finds itself in an environmentally fragile zone, distant from employment opportunities and lacking adequate urban and social infrastructure. Historically serving as a precarious housing option for low-income families, Caximba is now the focus of collaborative efforts involving various internal departments of the Ministry of Public Prosecutor of Paraná (MPPR).

Results: This program places great emphasis on community involvement, with a representative commission overseeing project progress and advocating for the interests of residents. The program also aims to empower women and promote gender-sensitive initiatives to ensure inclusive development. Legal compliance and environmental sustainability are also key considerations in this project. It includes solutions such as solar energy, rainwater harvesting, and permeable pavements to promote eco-friendly living. Moreover, circular economy initiatives are in place to foster sustainable livelihoods, including collective gardening and recycling programs.**Challenges:** Recognizing the complexity of the socio-environmental issues in Caximba, the MPPR emphasizes the need for a collaborative and interdisciplinary approach. The collaborative effort involves various departments, including housing, urbanism, environment, health, education, and others. This interdisciplinary approach allows for a more comprehensive and collective response to the demands of the population.

Case study 06: Growth Acceleration Plan - PAC (Nationwide)

Background: Established in 2007 as part of the federal government's Growth Acceleration Plan (PAC), the initiative for social and urban infrastructure development in informal settlements aimed to address Brazil's housing challenges. The Ministry of Cities, created in 2003, played a pivotal role in designing and executing a comprehensive national policy for informal settlement improvement, building upon constitutional recognitions and previous housing plans. Key milestones included the 1988 recognition of dwellers' ownership rights, the 2001 City Statute affirming the rights of informal dwellers, and the 2006-2008 National Housing Plan (PLANHAB). PAC was complemented by the "My House, My Life" program, emphasizing low-income housing subsidies and credit.

Objectives: i. Right to the City: Emphasizing the right of the poor to live in or near the city and access land; ii. Economic Return on Investments: Treating housing investments as contributors to short-term economic growth and wealth creation, with long-term benefits for social and economic development; iii. Integration of Interventions: Recognizing the importance of combining physical interventions, land title regularization, and environmental solutions for social inclusion and sustainability; iv. Population Retention: Prioritizing efforts to keep the population on their existing land, minimizing relocations, and addressing density and disaster risks.

Intervention: i. House Improvement and Construction: Aligning with local building standards, housing improvements targeted necessary relocations due to risks, with a focus on minimum disruption to residents; ii. Resettlement as a Last Resort: Resettlement was considered only in cases of significant risks, with active participation of families in decision-making processes and efforts to minimize relocation distance; iii. Sanitation and Infrastructure: Comprehensive actions addressed water and sanitation, drainage, waste disposal, electricity, roads, and mobility, ensuring access to public services and enhancing emergency response; iv. Environmental Recovery: Evaluation of environmental impacts, mitigation measures, and soil containment efforts were integrated into the projects, combining slum removal with preventive measures; v. Land Regularization: Developed in parallel with construction, land regularization aimed at constitutionally recognizing land tenure rights, facilitated by community-city collaborations; vi. Social Equipment: Facilities for health, education, leisure, and safety were built, addressing the specific demands of the population, and local governments were involved in beneficiary registration; vii. Social Work: Community organization, job creation, and post-occupation social and economic development were stimulated through social work activities, ensuring inclusivity from design to post-intervention phases.

Employment and Economic Development: Positive outcomes in informal settlements included the expansion of local businesses, formalization processes, and the establishment of formal businesses by major institutions. Public-Private Partnerships (PPPs) and national programs supported capacity building, training, and employment, fostering economic growth in these areas.

Financial Architecture: Funds were provided through federal budget allocations and loans, with the National Social Interest Housing Fund (FNHIS) and the Federal Severance Fund (FGTS or FAT) serving as key financial instruments. State and municipal matching resources complemented federal funds.

Repayment Mechanisms: Repayment strategies were designed to align with families' earnings, linking monthly payments to income. A Guarantee Fund reduced credit risk, provided insurance, and lowered tax and registry costs. Adjustments in program goals and parameters were made based on feedback, leading to refinements in income brackets, expanded goals, and improved service provision.

Case study 07: Integrated Upgrading Social Zones of Special Interest (São Paulo)

Background: Situated as the seventh largest metropolis globally and a focal point of Brazil's burgeoning economy, São Paulo serves as an instructive case study for the implementation of city-wide strategies to address the intertwined challenges of poverty and environmental issues within informal settlements. Approximately one-third of São Paulo's 11 million inhabitants, in a metropolitan region totaling almost 20 million as of 2010, reside in slum-like conditions. These encompass around 1,600 favelas, 1,100 "irregular" land subdivisions lacking legally recognized titles, and 1,900 cortiços, often densely populated and in precarious states of repair—a consequence of decades of migration without commensurate affordable housing provisions.

Objective: Zones of Special Interest (ZEIS) are designated areas subject to specific legal provisions tailored to urban spaces inhabited by low-income residents, characterized by settlement sizes and shapes deviating from formal zoning standards. This legislation allows designated locations to forego federal regulations for buildings and settlements, replacing them with standards more attuned to the reality of slums, such as a minimum house space of 45 square meters.

Implementation: In the early 1990s, São Paulo innovatively extended the use of the ZEIS instrument beyond the recognition of possession rights and regularization of slums. This involved introducing ZEIS for vacant plots or areas, aiming to establish reserves of public land for socially oriented housing in zones considered underused or empty as per the municipal master plan. Against the backdrop of evolving production patterns in the metropolitan region of São Paulo, the 1994 master plan proposed repurposing industrial zones, transitioning toward social housing to augment land availability. This pioneering approach created a land reserve for housing targeting the city's lowest income groups, upending the conventional logic of city zoning. In practice, municipalities in the São Paulo Metro Region delineated ZEIS in proximity to existing slums, seeking to align housing needs with underutilized land and facilitating, in numerous instances, the resettlement of families within the same region. A notable illustration is the ZEIS Jardin Edith, where relocation and new social housing were financed through the use of Certificates of Additional Construction Rights Potential (CEPACs). These financial instruments are traded on BOVESPA (the local Stock Exchange) and represent the right to additional construction in each Urban Operation implemented for new development.

Colombia

In Colombia, since the mid-1980s, a combination of decentralization and urban development policies has facilitated the implementation of neighborhood improvement programs with active municipal participation. In Bogotá, a 20-year application of the Integrated Urban Development Program for the Eastern Zone of Bogotá (PIDUZOB), partially financed by the Inter-American Development Bank, illustrated the potential for comprehensive interventions in large urban areas. The year 2000 marked a pivotal moment with the introduction of the Land Use Plan in Bogotá, establishing housing policy and improvement as long-term strategies. This led to the initiation of the local Integral Improvement Program (PMI). Over two decades and through five distinct phases, the PMI adapted to the evolving development plans of different local government administrations.

In Medellin, Integrated Urban Projects and Macroprojects (PUIs), implemented in tandem with investments in transportation, roads, and public spaces, have positively impacted approximately 1 million inhabitants since the early 2000s. Moreover, since 2008, Colombia has implemented a Neighborhood Integral Improvement Program (PMIB), focusing on various medium-sized cities across the country.

Case study 08: Medellin Integration Urban Program (Medellin)

Background: Medellin, a Colombian city of 4 million inhabitants, faced significant social exclusion and poverty, with two-thirds of the population residing in informal settlements known as barrios. Originating from land invasion, self-housing, and illegal subdivisions, these areas lacked essential services and public infrastructure due to restrictive urban regulations and inadequate housing finance. The Medellin Integration Urban Program (PRIMED), initiated in 1993 through a collaboration between the Government of Colombia and Germany, aimed to integrate these informal settlements into the formal city, bridging both physical and social gaps.

Intervention: The program implemented numerous infrastructure projects in Medellín's troubled neighborhoods, ranging from constructing schools, restaurants, parks, titling properties and community facilities. It prioritized strategic criteria, focusing on preventive planning, benefiting the poorest families, and integrating informal urban growth processes. By addressing hillside settlements and coordinating efforts across municipal, national, and international levels, it aimed to improve urban living conditions efficiently. Founded on principles of citizen participation and cooperation, the program garnered significant community support and legitimacy while enhancing overall quality of life.

Results: The initiative significantly enhanced the lives of informal settlement residents and the city as a whole, reducing travel time, improving public services, and fostering community pride. Notably, the "Medellin Miracle" led to an 80% decrease in homicide rates since the 1990s, earning international recognition and accolades, such as the "Most Innovative City of the Year" in 2012. Medellin transformed from a once-violent and unsafe place into a model city, boasting advanced connectivity, urban infrastructure, and successful municipal-owned utility companies. The success of the program can be attributed to key factors, including a national urban land reform policy, comprehensive city-wide planning, strong financial commitments from national and city governments, and a shift in mindset among policymakers to prioritize the poor with the best infrastructure and services. The Urban Development Corporation (EDU) played a crucial role in implementation, serving as a flexible, semi-autonomous public corporation that navigated bureaucratic challenges and fostered collaborative networks with local residents, civic groups, private entities, and NGOs.

Case study 09: Proyecto Urbano Integral- PUIs (Medellin)

Background: Integrated Urban Projects, referred to as PUIs in Spanish, serve as crucial instruments in Medellin's innovative social urbanism model. These projects are designed to address specific challenges within defined urban areas, incorporating physical, social, and institutional dimensions. The model places a strong emphasis on the enhancement of public services, the creation of vibrant public spaces, and improved mobility as key components for fostering integration and social cohesion. The success of Medellin's approach has been notable, particularly in the creation of public spaces that serve diverse functions, becoming central to civic pride and social cohesion. The PUI model represents a holistic approach to urban development, involving multiple stakeholders and emphasizing community participation.

Objective: The primary goal of PUIs is to create a transformative impact within targeted urban areas swiftly. The projects aim to address urban challenges comprehensively by integrating social intervention, institutional coordination, and physical upgrading. By fostering a participatory planning process, PUIs seek to engage various stakeholders and create a visible and positive transformation within the designated areas.

Implementation: In 2004, Medellin's Mayor launched the Integral Urban Projects (PUIs), focusing on providing equitable opportunities for citizens to access public services, education, housing, and food security. With a strategic emphasis on transforming the status and image of slum residents and their communities, the project invested around US$30 million from 2005-2007. Transformative icons, including the innovative Metrocable public transport system connecting hillside settlements with the subway and formal city, were developed, benefiting 40,000 people daily. The program is implemented through a multi-faceted approach that includes the development of highly visible features such as mobility infrastructure (cable cars, exterior escalators, and improvements to the pedestrian environment), and involve the creation of a network of library parks, serving as green spaces, redefining urban centralities, and functioning as community centers alongside offering library services. PUIs also encompass the establishment of new schools, childcare and recreation centers, avenue revitalization initiatives, public spaces, and upgrades to housing infrastructure. This comprehensive intervention addresses urban challenges holistically, bringing about positive changes in the physical, social, and institutional aspects of the specified urban areas. Medellin's success in implementing the PUI model demonstrates the efficacy of this approach in enhancing urban spaces, fostering community pride, and promoting social cohesion.

Challenges: While Medellin's social urbanism model and the PUI approach have proven successful locally, Colombia faces challenges in scaling up and transforming these innovative policies into national strategies. Currently, positive experiences are limited to two cities—Bogota and Medellin. The challenge lies in extending these successful local initiatives to a national scale, ensuring broader adoption of effective urban planning strategies. The replication of the PUI Nororiental methodology in PUI Comuna 13 highlights the experimental nature of these projects, serving as a "laboratory" for urban transformation. However, each PUI project must be understood as unique, emphasizing the importance of interpreting spaces from local experiences. Additionally, the model stresses the need for community involvement but underscores the delicate balance between seeking validation for projects and avoiding excessive participation, which could potentially lead to project disruptions or community divisions.

Chile

In Chile, the Chile Barrio Program, initiated in 1996 as part of the National Program for Overcoming Poverty, conducted a census of irregular settlements, revealing 972 such settlements, 93,457 dwellings, and 445,943 people. This intersectoral initiative aimed not only to enhance habitat quality but also to generate opportunities for social and labor integration for those living in these conditions. The attention to campsites evolved through different phases: the Campsites Assistance Line (2006-2009) addressed 490 campsites and 20,599 families; the Villages and Campsites Program (2011-2014) managed 657 campsites and 31,158 families, focusing on subsidies and camp closure management; and the Campsites Program (2014-2018) shifted its approach to understanding campsites as linked to cultural factors, residential preferences, and collective habitat production, aiming to provide housing solutions with community participation. An update in 2019 showed an increase from 657 to 802 campsites and from 31,926 to 47,586 households. The Ministry of Housing and Urbanism (MINVU) has since 2011 implemented a Campsites Program with IADB's funding focusing on in-situ urbanization and relocation of families from high-risk areas, closing 53 campsites annually and integrating households into the formal city as they obtain formal housing solutions, effectively reducing the number of households residing in campsites.

Case study 10: Chile Barrio Program (Nationwide)

Background: In the late 1990s, despite efforts to eradicate slums in Chile, Un Techo para Chile's survey revealed the persistence of informal settlements. The Ministry of Housing and Urbanism (MINVU) estimated 972 informal settlements housing 104,943 families. Recognizing the limitations of traditional approaches, the government acknowledged pockets of extreme poverty that economic growth and conventional social policies couldn't eradicate. By 1996, 23.2 percent of Chileans, including over 800,000 in extreme poverty, lived below the poverty line. These challenges prompted the initiation of the Chile Barrio program in 1996, aiming to eliminate informal settlements identified in the National Registry and uplift families living in them.

Intervention: Implemented between 1996 and 2005, the Chile Barrio program adopted an intersectoral approach to address housing, social, and economic challenges. Its objectives encompassed three main components: (i) improving housing and neighborhoods to provide families with access to essential services, (ii) promoting social empowerment by strengthening institutions and social networks, and (iii) enabling productive labor by enhancing human capital through formal education and job training. The program aimed to enhance the quality of life for informal settlement dwellers through participatory projects. Initially structured with three components, a fourth component was added between 1997 and 2001 to support institutional strengthening programs addressing poverty. However, in 2001, the fourth component was eliminated, and maintenance activities were integrated into the first component. The program, led by MINVU, featured an ad hoc institutional structure, including a specialized task force at the national, regional, and local levels, engaging professionals, technicians, and activists. With a multisectoral-funding model, resources were primarily allocated through MINVU's special budget, supplemented by complementary resources from other public institutions, directed towards social, educational, and urban aspects of the projects.

Challenges: The ad hoc institutional structure, while innovative, posed coordination challenges between the task force and the traditional Ministry structure. The multifaceted nature of the program, involving professionals, technicians, and activists at the local level, required careful integration to address the diverse needs of communities. Despite these challenges, the program's multisectoral-funding model showcased a collaborative and comprehensive strategy aimed at sustainable development, emphasizing the importance of addressing housing, social, and economic dimensions simultaneously.

Case study 11: Programa de Campamentos (Nationwide)

Background: After the Chile Barrio Program, surveys in 2011 and 2019 identified a continuous growth in the number of campamentos, indicating a worsening situation in recent years. This trend prompted urgent attention to irregular settlements in the country. The historical context underscored the need for intersectoral solutions that encompassed not only housing demands but also promoted social and urban integration.

Intervention/Objectives: In this context, the Ministry of Housing and Urbanism (MINVU) introduced the Programa Asentamientos Precarios in 2011 to strengthen housing policies and improve the living conditions of households in informal settlements through participatory and integrative approaches, valuing community organization. The establishment of the Secretaría Ejecutiva de Aldeas y Campamentos in that year formed the basis for the program's development. The primary focus was on providing housing subsidies to families, enhancing habitability conditions, and reclaiming occupied territories through campamento closure management. By 2014, 122 campamentos identified in the 2011 survey had undergone closure procedures. The program employs three housing intervention strategies: (i) relocating households within the territory through the provision of new housing, (ii) urbanization and neighborhood consolidation, and (3) relocation of households to different places outside the campamento with individual or community-wide transfers. To enhance social support during family engagement in campamentos, the Plan de Acción Social y Comunitaria (PASYC) was created.

Current strategies: Presently, the Programa Asentamientos Precarios is pursuing new strategic directions outlined in the Plan de Emergencia Habitacional: the Plan Gestión Habitacional and the Plan Construyendo Barrios. The former focuses on delivering individual or collective housing solutions through the acquisition of new or existing homes or the development of housing projects. The latter is a comprehensive urban acceleration plan for campamentos aiming to strengthen household relocation strategies, either through urbanization or housing projects. Its goal is to consolidate neighborhoods and communities, improving living conditions to reduce vulnerability levels amid the ongoing national housing crisis. The program's objectives include contributing to the reduction of households residing in campamentos, preventing the formation and expansion of new campamentos, enhancing urban integration and habitability, and increasing social and economic inclusion for households in these settlements.

Lessons learned from LAC Neighborhood Upgrading Programs

The aforementioned initiatives demonstrate the potential for transforming informal settlements into liveable and sustainable communities, highlighting Latin America's extensive 40-year experience in addressing challenges within such environments and providing a solid foundation for learning and discussion. Key insights drawn from diverse regional experiences, as highlighted by various authors (Reese et al., 2024; Alcocer et al, 2010; Acevedo et al., 2021; Libertun de Duren & Osorio Rivas, 2020), underscore the **imperative to shift from neighborhood-focused projects to comprehensive urban initiatives, with a keen emphasis on thoughtful consideration of scale.** Exemplary cases, such as the Integration Project for the Southern Area of Resistencia and the Integrated Urban Projects (PUIs) in Medellin, highlight the importance of transcending mere physical outputs and actively engaging mechanisms for socio-territorial transformations. For instance, according to a report on PUIs, their success is attributed to careful delineation of the area of operation, considering spatial, environmental, and social aspects rather than administrative divisions. Combining projects of different scales, from city-wide to neighborhood-specific, has proven effective in creating a meaningful impact (EDU et al., 2015). However, this transition warrants careful reflection, particularly concerning potential impacts on real estate markets. Furthermore, the strategic expansion of intervention areas emerges as a vital approach for integrating neighborhoods into the broader urban context, addressing deficiencies observed when interventions were confined to specific, often peripheral, zones. These experiences also shed light on the delicate balance required to prevent conflicts with neighboring communities, emphasizing the importance of inclusive and flexible methodologies for successful integration and adaptation to each specific context.

Urban planning, service networks, mobility, and public spaces play pivotal roles as catalysts in driving transformation processes. In Latin America, assessments of Participatory Budgeting (PMB) consistently demonstrate their ability to bring about tangible improvements in family and community living conditions. The impact, predominantly positive, is most evident in urban and housing conditions, leading to a high level of residential satisfaction. The physical outcomes of PMBs, including improved sanitation infrastructure, enhanced public spaces, better street mobility, and advancements in waste collection, significantly contribute to a positive shift in the quality of life for households and users. These interventions address critical needs in socio-territorial contexts marked by isolation and substantial deficiencies. The physical transformations not only represent significant improvements but also serve as symbols of a "historic restoration" for communities facing challenging social situations. Various studies highlight the population's appreciation for sanitation initiatives, general enhancements of public spaces, street accessibility, and waste management improvements. However, it's crucial to acknowledge that the sustainability of impactful urban projects requires robust integration with community development strategies to avoid becoming temporary urban installations lacking transformative substance. Internationally, certain successful PMB solutions, such as the "metrocable" transportation system in Medellín, have become influential models replicated in cities like La Paz, Caracas, and Rio de Janeiro, underscoring the global resonance of these initiatives (Magalhães et al., 2016). In the Rodrigo Bueno Neighborhood in Buenos Aires, the implementation of PMB has notably contributed to the establishment of a gastronomic courtyard and a women-managed venture called Vivera Orgánica. These initiatives are strategically designed to uplift local gastronomic enterprises, resulting in a positive economic impact on the development of families in the neighborhood (GCBA, 2023).

The challenges and prolonged timelines associated with land regularization prove to be intricate and not easily sustainable for all PMB initiatives. All programs encounter difficulties in formalizing the lands occupied by informal settlements, and implementing a fully integrated regularization program takes many years, particularly when legal disputes are involved (Fernandes, 2011). Despite legal and administrative differences among countries, documents, and evaluations converge on common aspects explaining the complex steps required for land formalization. The finalization timelines depend on the neighbourhood's characteristics and the starting point at the project's outset, and the intermediate and final steps in the process occur in successive stages. These stages encounter various obstacles, such as challenging title state studies, complex surveying processes causing delays, difficulties obtaining debt-free certificates from beneficiary families, and obstacles due to high notary costs. Addressing these challenges demands significant political and institutional efforts, translating into prolonged land tenure legalization processes. While the lengthy process has undeniable benefits for families, providing the highest level of tenure security, protection against forced evictions, reduced legal conflicts, and marketability in the real estate market, studies reveal that obtaining property titles may not be a top priority for informal settlement families[2]. Additionally, PMB experiences show that once families secure tenure through various instruments, they don't wait for property formalization to initiate constructive improvements in homes and urban collective services.

The costs associated with neighborhood improvement projects are undoubtedly high, yet the value generated by their implementation is equally substantial. Consistent findings across studies emphasize the elevated costs of interventions in informal settlements compared to the investment required for developing urban areas from scratch. Completing and renovating consolidated areas, often marred by environmental issues and risks, poses significantly more complexities than developing planned and vacant sectors. Thus, it becomes crucial to supplement PMBs initiatives with territorial management policies and tools that enhance the affordable and well-located supply of urbanized land, preventing land occupation from being the sole option for lower-income sectors. Despite the high costs involved, economic evaluations of PMBs and other studies consistently demonstrate that neighborhood improvement leads to real estate appreciation, socially justifying these projects. Regarding land formalization programs, analyses of experiences in multiple countries show consistent results regarding land titling effects on land value (an increase of around 25%) (Fernandes, 2011). Similarly, a study found that for the case of the "Comprehensive Neighborhood Improvement and Fiscal Land Titling Pilot Program" in Colombia, titled homes had, on average, a 37% higher value than those without titles (Cuenin, 2009). Furthermore, research in Brazilian cities verifies this positive correlation between program implementation and property prices. In the case of Recife, 56% of interviewees stated that the most significant contribution to the appreciation of their property was due to the urbanization program (Abramo, 2009). In Argentina, various studies estimated the impact of environmental and urban improvement programs on property prices in and around informal settlements. For instance, the study of the Sustainable Urban and Environmental Management Program of the Reconquista River Basin, where more than 300 informal settlements are located, estimated that a house in a settlement intervened by PROMEBA was worth 31% more than a unit of the same characteristics located in a non-intervened settlement (AYDET, S.A., 2015).

Facilitating the integration of informal settlements into the formal economy through PMBs not only unlocks economic potential but also fosters sustainable growth within these communities. Residents of informal settlements significantly contribute to the urban economy through informal businesses and employment. Despite being situated on the periphery of urban areas with limited access to markets and resources, informal settlements function as dynamic economic hubs, supporting vibrant and specialized economies that provide jobs and livelihoods. For example, a study in Barrio Padre Mugica sheds light on the economic contributions, revealing total monthly sales of 31.9 million pesos (US$1.83 million) as of June 2017. The average sales per store/position were 42.3 thousand pesos (US$2,428), with a median value of 21.2

2 According to Reese et al. (2024), in the evaluation of PROMEBA II in Argentina, community leaders expressed that achieving perfect property titles was important, but delays were not a major concern. This suggests that legal possession and recognition as taxpayers, achieved through PROMEBA intervention, provide families with three interconnected "securities": a) security of property tenure (transmissible to heirs); b) security of residence at the site; and c) security to transact the property in the informal market at a higher value. These "securities" are linked not only to high formalization costs but also to future costs of maintaining formality in personal events, resulting in lower family interest in achieving the perfect property title goal.

thousand pesos (US$1,214). Self-employment income, including business profit and tax payments, averaged $19,825 pesos (US$1,136), with a median value of $8,778 pesos (US$503), reflecting income variations around 1 to 2 minimum wages. The value added before depreciation, constituting 50% of sales, encompasses salaries, the organizer's self-employment income, and business profit, with the wage component representing merely 7% of the value added due to the prevalence of self-employment. Notably, compared to the Commerce Sector of the City and the average Value Added to Sales Ratio of CABA (74% and 57% respectively), Barrio 31's figures are slightly lower. Additionally, the total monthly sales in the neighborhood, nearly 25% of an average City shopping center's sale, underscore the significant economic footprint of these informal economies (Goytia et al., 2017). In light of this, initiatives like CeDeL[3] should be recognized and integrated into PMBs as essential components, aiming to promote economic integration with other neighborhoods. This inevitable step requires the implementation of a series of long-term political strategies capable of transforming the local endogenous commerce of the neighborhood into a more interconnected commercial circuit within the city.

The implementation of assisted self-management construction models, particularly focusing on providing economic support for materials and, when needed, technical assistance for labour, is yielding promising results. Initial findings point to swift project execution when labor is financially supported, increased beneficiary engagement, strong project ownership, and a significant reduction in post-construction issues. In Latin America and the Caribbean (LAC), a substantial housing deficit persists, encompassing both quantitative (housing shortage) and qualitative aspects (substandard housing conditions). With over 23 million households lacking proper housing and 43 million homes in inadequate conditions, the conventional strategy of merely increasing construction falls short (Wainer, 2022). Thus, a paradigm shift is imperative—a shift that prioritizes not just quantity but the improvement of existing units in precarious conditions. For instance, Argentina's Mi Pieza Program, eight months after implementation, showed a 46% increase in the likelihood of durable flooring and a 21% improvement in roofing. The program also effectively reduced overcrowding by 47%, leading to enhanced subjective well-being and improved perceptions of security, privacy, and health. These positive outcomes align with broader studies, emphasizing that addressing the housing deficit goes beyond mere construction, requiring tailored solutions within existing structures (Vasquez & Lince, 2023).

The successful execution of PMB initiatives demands a robust enhancement of technical, coordination, and institutional articulation capabilities, as well as political will. As these projects evolve to encompass new dimensions beyond traditional physical improvement and land regularization, there is a pressing need for a meticulous analysis and reinforcement of the institutional capabilities of executing agencies. Several analyses underscore the multifaceted challenges involved, the need for diverse specializations, intensive inter-institutional coordination, robust monitoring mechanisms, suitable IT systems, and adequately trained technical personnel (Brakarz, 2008). It is of utmost importance to address institutional limitations throughout project phases, coherent and well-targeted technical support. This support spans project design, pre-construction planning, continuous implementation, and monitoring (including information management systems), and community participation. Strengthening coordination mechanisms between different levels of state administration (national, regional, and local) and within each level is identified as crucial for the successful execution of programs. The involvement of all levels of government in the formulation of regularization policies is pivotal to their effectiveness and the integration of territorial organization and land development regulations (Fernandes, 2011). Additionally, the need for continuous investment in human capital, combining academic knowledge with practical skills, is emphasized for long-term success in addressing local challenges. For instance, the urban transformation in Medellin carried out by PUIs was led by young professionals, including former university educators. Their interdisciplinary approach, community engagement skills, and systemic view of projects were vital (EDU et al., 2015).

3 For more details on CeDeL, please refer to Case Study 01: Barrio Padre Mugica, specifically the 'Economic Development' section.

The involvement of territorial teams is of paramount importance for comprehending the multidimensional impacts of interventions. In Latin America, the traditional sectoral perspective of territorial public policies has led to a dual-city model, dividing formal and informal city issues across different administrative bodies with limited coordination. The ongoing implementation of Neighborhood Improvement Programs recognizes the complexity of socio-territorial problems, highlighting the necessity for a comprehensive approach and coordinated, multisectoral actions. The success of PMBs interventions is closely linked to the diverse and integrated nature of their initiatives. The evaluation of Argentina's PROMEBA IV underscores the integral role of field teams in ensuring the success of these projects, emphasizing their effectiveness in coordinating with residents and reaffirming neighborhood identity (Casullo, 2022). This approach proves crucial in addressing not only the physical but also the social dimensions of informal settlements, demonstrating the significance of comprehensive strategies and effective collaboration between stakeholders in achieving sustainable urban development.

Community participation in decision-making strengthens self-management and local organizational capacities, optimizing the use of public resources that sustain neighborhood improvement and integration processes. Despite the complexity and non-neutrality of participation, it is a fundamental tool for democratizing urban intervention practices. The ability of individuals and social groups to influence the conditions affecting their lives defines participation, involving voluntary social interaction to intervene in and benefit from public activities. The Housing Institute of the City of Buenos Aires employs participatory workshops as a key element in its slum-upgrading initiatives across the capital of Argentina. These workshops focus on achieving consensus regarding crucial design aspects of interventions and have played a pivotal role in major projects such as the extensive slum-upgrading effort in Barrio Padre Mugica (Barrio 31)[4]. The participatory approach has also influenced initiatives in Rodrigo Bueno, Villa 20, and Barrio Fraga. For instance, in Barrio Fraga, nearly two-thirds of residents underwent relocation to new housing units within the same barrio, a process guided by participatory decision-making to ensure community support. A parallel approach was adopted in Barrio Mugica/31, resulting in the construction of 1,254 new housing units to accommodate families from historic settlements, exemplifying the efficacy of community involvement in urban development projects. To foster innovation in PMB design and management processes, new forms of participation and representation are required, embracing the diversity of points of view. Programs grounded in community participation contribute decisively to sustainability and the development of a more direct and comprehensive local democracy (Imparato & Ruster, 2003). Evaluations highlight the need for increased innovation in social participation methodologies, urging genuine representation of organizations and exploring decision-making systems beyond traditional consultation spaces. PMBs face the challenge of creating effective knowledge exchange spaces with residents and developing collaborative, interactive, and shared forms of planned project management.

Sustainable urban interventions demand community involvement, ongoing maintenance efforts, and consideration of external factors. The design of PMBs can withstand the test of time, provided materials with minimal maintenance requirements are chosen, and a recurring expenditure element is incorporated for regular infrastructure repair. Emphasizing additional resources for mountainous and densely populated areas is crucial. For optimal outcomes, it is essential to involve and educate residents in preserving the interventions, recognizing that the improved neighborhoods may attract more people, thereby increasing the demand for the built infrastructure. Additionally, it is vital to grasp that built interventions may not be sustainable in neighborhoods grappling with chronic local violence or places where there is a notable absence of authorities or government, as they necessitate constant monitoring by all stakeholders to ensure the project's durability. For instance, based on an analysis by the Inter-American Development Bank (IADB) examining the Favela-Bairro intervention ten years post-implementation (Libertun de Duren & Osorio Rivas, 2020), the primary conclusion reveals that although there was an immediate improvement in residents' quality of life after the interventions, over time, the

4 In Barrio Mugica, for instance, community participation is considered essential for the sustainability of projects, viewing citizen involvement as an opportunity to enrich proposals and foster ownership. The Participatory Management Council, established by Law 6.129 in 2018, ensures active resident engagement, meeting monthly to monitor compliance and encourage participation. The neighborhood's political system, comprising 10 zones and 109 delegates, facilitates structured communication, with monthly sessions ensuring residents' full and informed participation in the urbanization process.

infrastructure degraded, and public services suffered deterioration and abandonment, almost reverting to their original state or conditions similar to untreated favelas. When assessing the maintenance status of the infrastructure, the result showed that ten years after project completion, the intervened favela group scored similarly to the control group. Multiple factors were identified as causes of infrastructure deterioration, not necessarily associated with the Favela-Bairro II program. Population growth, for instance, was a significant factor; between 2000 and 2010, the population of Rio's favelas increased by almost 27%, while in the rest of the city, it grew only by 3.4% (Brazilian Institute of Geography and Statistics, IBGE). A report on PUIs in Medellin also emphasizes the importance of community involvement, responsible decision-making, and ongoing community support beyond project completion for long-term impact (EDU et al., 2015).

In the realm of practical urban policymaking, specifically for PMBs, accuracy in data is key. It is vital for designing and executing effective strategies that influence every aspect of managing urban areas, from understanding issues in informal settlements to evaluating the success of improvement programs (Acevedo et al., 2021). The scarcity of data in these informal areas makes it challenging to create housing policies that truly meet the needs of the most vulnerable populations. A common challenge faced by many countries is the limited information available about these informal settlements. Even when data is available, keeping it updated poses difficulties, hindering effective intervention, and worsening the gap between formal and informal urban spaces. How data and narratives are constructed using available information is far from passive. The representation of reality sets the boundaries and frameworks defining the possibilities to transform it (Acevedo et al., 2021). The critical decision of what to represent and, implicitly, what to omit holds paramount importance. This approach facilitates the understanding of different perspectives, as well as the challenges and needs of these places. For instance, Argentina took a proactive step by creating the National Registry of Popular Neighborhoods (RENABAP) between 2016 and 2017. This registry, the first official survey of informal settlements, provides families in these areas with a certificate of household that enables them to access essential urban services[5]. Another example is the Camps Registry in Chile, which incorporated online surveys and web applications that gathered real-time georeferenced information, facilitating the fieldwork for surveyors and subsequent data analysis[6].

In conclusion, it is of utmost importance to conceive and integrally execute PMBs. The success of interventions depends on addressing physical, social, economic, and inter-institutional aspects simultaneously.

5 For further information, please refer to the official website: https://www.argentina.gob.ar/desarrollosocial/renabap

6 For further information, please refer to the official website: https://storymaps.arcgis.com/stories/dfe1fe1afd334ec-790f879e736a5af5e

Economics of the Sector: Economics of addressing informal settlements in Latin America

The rapid urbanization and sprawling growth of cities, both in contemporary developing countries and historically developed ones, have led to the creation of informal settlements and poverty belts with limited access to services. This trend is particularly pronounced in Latin American cities, where rapid urbanization processes highlight the challenges of planning organized urban growth (Daude et al., 2017). Insufficient infrastructure, both in transportation and public services, coupled with restrictive land use regulations, has prevented cities in the region from absorbing migratory flows and expanding their size in an organized manner, thereby hindering access to the economic opportunities offered by the city. In this context, the population growth of Latin American cities has increased the incidence of informal settlements, where housing conditions are precarious, and access to quality jobs and basic services is limited (Daude et al., 2017).

Furthermore, the vulnerability of informal settlements is exacerbated by their often-precarious locations in geographically vulnerable areas, exposing residents to environmental risks such as landslides, sea-level rise, and flooding. The elevated risk of disasters results in significant negative externalities, such as the loss of services, damage to homes, loss of livelihoods, and the rapid spread of diseases[7] (World Bank, 2012). It is worth noting that the decision to settle in these vulnerable areas is driven by trade-offs between affordability, proximity to opportunities, and existing social networks. However, the consequences are severe, as insecure tenure exposes residents to constant risks, hindering investments in housing improvements and services (World Bank, 2012).

As a result of urban expansion without planning, there has been an increase in motorization rates, generating extensive distances and low population densities in the region (Vera et al., 2024). This is reflected in households allocating between 6% and 19% of their monthly expenses to mobility (Daude et al., 2017). For instance, in cities like São Paulo, Bogotá, Mexico City, and Lima, a quarter of the population spends at least one hour per day commuting to work (Daude et al., 2017). In addition, the high demand for housing in central areas and restrictive land use regulations lead to an increase in housing prices, excluding numerous low- to middle-income families from the formal market. This phenomenon has fueled the development of the informal housing market, manifested in the emergence of informal settlements, as well as the growth and densification of existing ones.

7 In addition to this, the World Bank (2012) emphasizes the heightened risks faced by impoverished individuals in slums, including overcrowded living conditions, unsafe housing, inadequate nutrition, and poor health.

From a financial standpoint, despite informal settlements addressing the immediate need for affordable housing at an individual family level, they incur significant private and public costs. As emphasized by Ferguson and Navarrete (2003), private costs arise from the efforts families invest in constructing suitable shelters over an extended period of time. Moreover, there are heightened environmental health risks, leading to a higher prevalence of diseases, increased levels of disablement, and premature death among residents of these informal settlements. On the public side, the costs manifest in the investments required to upgrade informal settlements. This includes reorganizing the settlement to establish a proper street layout, relocating families to facilitate this task, and providing essential infrastructure such as paved roads, water, and sanitation.

The costs associated with improving conditions in informal settlements, as highlighted by the World Bank (2012), are highly contingent on specific locations, with considerable variations in unit costs even within cities. According to approximate figures from the UN Millennium Project (Sachs et al., 2005), the average unit cost for upgrading slums is estimated to be around US$670 per capita or about US$2,500 per unit. This approximation includes investments in land titling, access to water, sanitation, and sewage treatment, social initiatives in education and health, along enhancements to residential structures, but excludes the price of land. Furthermore, the UN Millennium Project (Sachs et al., 2005) suggests that meeting the upgrading needs of the targeted 100 million slum dwellers (as outlined in Millennium Development Goal 11) between 2005 and 2020 was projected to require $67 billion over the 15-year period. Accommodating the housing needs of the 570 million new arrivals would necessitate an additional $227 billion. The combined cost for both upgrading existing slums and providing new or alternative shelter amounts to $294 billion (Freire, 2013). This means that expanding these upgrading initiatives to cover the entire 1 billion slum dwellers would escalate the total cost to $897 billion, equivalent to an annual expenditure of around $60 billion, six times the current yearly investment in slum upgrading programs (Freire, 2013). This underscores the substantial financial commitment required to address the challenges of informal settlements on a global scale.

A recent study conducted by the World Bank (GPRH, 2022) analyzed the housing upgrading costs of 11 countries in Latin America and the Caribbean[8]. The results indicate that the average cost for improving locational housing (such as renovating bathrooms, kitchens, walls, and roofs) is USD 5,311, with a standard deviation of USD 1,539. This means that the cost of improving locational housing in the 11 countries analyzed ranges from USD 3,772 to USD 6,850. For structural housing improvements (such as foundation, columns, beams, and roof structure), the average cost is USD 9,369, with a standard deviation of USD 2,609, ranging from USD 6,760 to USD 11,978 across the 11 countries. Regarding intra domiciliary water and/or drainage connections (including hydraulic and sanitary networks, inspection chambers, meters, pipes, and sanitary appliances), the average cost is USD 2,582, with a standard deviation of USD 737, ranging from USD 1,845 to USD 3,319. For expansion or densification (either construction of an additional space with a sanitary unit to mitigate overcrowding or construction of an additional independent housing unit for unmitigable overcrowding), the average cost for mitigable overcrowding, assuming the construction of an additional space with a sanitary unit, is USD 9,369, with a standard deviation of USD 1,326, ranging from USD 5,510 to USD 8,162 across the 11 countries. For unmitigable overcrowding, assuming the construction of an additional housing unit of 50 m2 in height, including kitchen, bathroom, 2 bedrooms, a living-dining space, and the mezzanine slab, the average cost is USD 19,630, with a standard deviation of USD 4,298, ranging from USD 15,333 to USD 23,928.

Ultimately, it is imperative to acknowledge that, while the private sector can play a contributory role in Neighborhood Upgrading Programs, the overarching responsibility for effective urban planning and the integration of informal settlement communities into the broader urban fabric predominantly resides with governmental entities.

8 Argentina, Brazil, Paraguay, Peru, Ecuador, Colombia, Chile, Mexico, Guatemala, Panama, Dominican Republic.

Case study 12: Fondo de Integración Socio-Urbana (Argentina)

In Argentina, the Socio-Urban Integration Fund (FISU), established through Decree No. 819/2019 in alignment with Law No. 27,453, is a pioneering initiative. Its primary objective is to finance socio-urban integration projects for Popular Neighborhoods listed in the National Registry of Popular Neighborhoods (ReNaBaP) and facilitate the creation of serviced lots. RENABAP was instituted following a comprehensive census of slums and informal settlements. As of December 31, 2016, RENABAP encompassed 4,416 informal settlements, housing over 930,000 families (approximately 4 million people), constituting nearly 10% of the Argentine population.

The colossal challenge demands an estimated investment exceeding $26 billion to regularize the settlements, surpassing 150 times the annual direct investment from the federal government for slum and informal settlement development programs. The innovative fund created by law aims to combine public resources with developmental and private capital, offering a new asset class for private and institutional investors in Argentina. Conceptualized as a debt vehicle for provinces and municipalities seeking to invest in the regularization of informal settlements, loans will be backed by each province's share of federal tax co-participation, with the potential for additional sovereign guarantees. This dedicated fund represents a unique, public-private impact initiative in Latin America.

In 2020-2021, an initial layer of public capital, approximately AR$60 billion (roughly US$300 million), was secured from specially designed tax revenues, predominantly contributed by high-net-worth individuals. Envisaged as a 15 to 20-year endeavor, the PISU recognizes that achieving impactful solutions at scale requires more than public funding alone. The influx of private capital into the fund is crucial, bringing the right set of incentives and robust frameworks to monitor and deliver improved social outcomes.

Financing the Provision of Services

Infrastructure and public utility investments stand as the most important items of any upgrading program, typically comprising between 50% to 75% of the total costs. These vital components encompass tertiary infrastructure such as streets, water and sewer systems, street lighting, solid waste collection, access to gas and electricity, land stabilization, drainage, and parks. On average, the infrastructure cost per household amounts to approximately US$2,000, with investments in street and walkway enhancements constituting 40% of this expense. Generally, government entities finance infrastructure projects through long-term funding mechanisms, supplemented by contributions from donors and other financial intermediaries. Moreover, beneficiaries of these initiatives typically contribute to the repayment of infrastructure costs through user fees or tariffs.

Various financial instruments can be employed by cities to support Neighborhood Upgrading Programs. Initially, grants, federal funds, and community initiatives are commonly utilized during the program's nascent stages. As technical expertise and financial resources expand, micro-financing schemes, community credit facilities, and national provident funds can be tapped into. At an advanced stage, national housing programs interlinked with the financial sector and subsidy schemes empower urban residents to leverage their savings for the acquisition or rental of affordable housing.

In the context of financing structures and funding sources pertinent to Neighborhood Upgrading Programs, the prevalent modalities include: (i) Allocation from Public Sector Funds, (i.i) Utilization of Provident Funds, (ii) Reception of Donor-Supported Financing, (iii) Implementation of Land-Based Titling mechanisms, (iv) Deployment of Housing/Shelter Micro-finance mechanisms, and (v) Establishment of Collective Savings and Community Funds.

(i) Allocation from Public Sector Funds. The public sector, including municipal, regional, and central governments, is crucial for start-up funding in upgrading programs. Municipal governments play a significant role in identifying needs, organizing projects, and supervising implementation and financing. However, municipal financing is often limited, and central governments are the primary source of financing for upgrading programs. These funds can take the form of matching grants, individual subsidy programs, or loan or credit enhancement programs. National funds are set up to co-finance local development investment projects and are typically executed by local agencies. Federal funds can also be provided directly to individual residents as part of social programs or to access low-rate loans or micro-credit. Central government loans can assist local governments and communities in financing upgrading programs. Funds can be distributed to credit institutions or private lenders, or through guarantees to private banks. This can enhance community lending and related markets.

(i.i) Utilization of Provident Funds. Provident funds are savings schemes that collect mandatory contributions from private and public employees as a percentage of their salary. They are used by emerging economies to solve the problem of lack of medium-term funds. The FGTS in Brazil operates as a provident fund and provides low-income housing finance, which prevents slum proliferation. FGTS has refocused its target group on low-income groups, with 77 percent of its loans going to households with incomes less than five times the minimum wage. INFONAVIT in Mexico provides a similar profile to help contributors access housing loans. Provident funds require careful management and rigorous accountability to ensure proper targeting.

(ii) Reception of Donor-Supported Financing. International donors play a significant role in financing urban upgrading, providing cash for investment and technical expertise. From 1992 to 2005, the World Bank and the Inter-American Development Bank provided $11.7 billion for slum upgrading and shelter, with a focus on large-scale policy programs. Private sector involvement in housing development has also increased. Bilateral donors, including USAID, SIDA, GIZ, and AECI, have significant programs in Neighborhood Upgrading Programs, while the Asian Development Bank supports technical assistance for housing finance entities. Advocacy and financing agencies, such as Cities Alliance and the UN Slum Upgrading Facility, have also been created by donors.

(iii) Implementation of Land-Based Titling mechanisms. Urban land financing is a means of raising revenue for infrastructure without borrowing. The public invests in infrastructure, which increases the value of adjacent land. If the public sector can capture this extra value through taxes or other means, more financing is possible for infrastructure without straining local finances. Examples of this financing scheme are seen in cities like São Paulo. Other approaches aim to curb speculative profits associated with the increase in land values. In some cities in Colombia and Porto Alegre, Brazil, the government acquires land for low-income housing projects and gains control over land use. The city profits from the difference between the sale value of the plot and the price it paid for the land.

(iv) Deployment of Housing/Shelter Micro-finance mechanisms. Low-income households struggle to afford market-rate loans or save enough money to improve their shelter. Mortgage lending is limited to those with steady, verifiable incomes. To address this, housing microfinance institutions offer small loans (typically ranging from $550 to $5,000) without collateral, with limited maturity. Examples of such institutions include Mibanco in Peru, the Fundación Hábitat y Vivienda in Mexico, and the Kuyasa Fund in South Africa. Housing microfinance is often included in neighborhood upgrading programs. For instance, small-scale community infrastructure projects in Nicaragua are financed through small loans ranging from $200 for housing improvement to $300-$1,500 for micro-enterprises.

(v) Establishment of Collective Savings and Community Funds. Collective savings are vital in connecting poor communities with financial institutions and funding infrastructure and housing improvements. NGOs in countries like Pakistan, South Africa, and Namibia collect community savings that are used for infrastructure financing. Savings groups encourage collective finance for shelter improvements and leverage resources from national governments and foreign donors. Examples of such groups include Slum Dwellers International in India, the Cambodia Urban Poor Development Fund, and the Baan Mankong in Thailand. The Asian Coalition for Collective Action provides small grants for community initiatives to upgrade slums or informal settlements in 19 nations. Communities themselves identify their key priorities and receive quick funding to leverage complementary sources of finance.

It is important to acknowledge Neighborhood Upgrading Programs as a priority investment for socio-economic progress and development, exploring diverse fiscal avenues that extend beyond mere cost recovery. Such programs ought to establish mechanisms fostering financial viability while safeguarding the purchasing power of marginalized communities. This entails adopting land policies, fostering community-based savings initiatives, and actively engaging local organizations to tailor solutions to local needs. Achieving financial sustainability mandates a strategic combination of municipal finance, cross-subsidization strategies, and beneficiary contributions. Moreover, a well-rounded financing strategy must encompass a blend of short-, medium-, and long-term loans to seamlessly integrate building, infrastructure, and livelihood enhancements.

Role of the Private Sector

The private sector has historically played a role in providing housing for low-income individuals, as the demand for affordable units can be a profitable business. This trend continues today, with large international banks seeking partnerships in this area and companies extending supplier credits and mobilizing capital through bond issuance. Land-based financing has also become a mechanism for attracting private developers as co-investors in settlement-upgrading programs. Land pooling and readjustment have also been used to develop affordable subdivisions for low-income dwellers. These schemes involve consolidating urban fringe areas and contracting a private sector developer to sell serviced land while compensating original landowners with ownership of plots commensurate with their original share.

In Latin American cities, the private sector is involved in improving informal settlements through various initiatives such as public-private partnerships (PPPs), microfinance, and other models for housing, basic services, and infrastructure development. These initiatives aim to address the challenges faced by informal settlements and improve the living conditions of their residents.

Case study 13: Impact Investment (BNDES in Brazil)

BNDES investments refer to the financial operations and loans provided by the Brazilian National Bank for Economic and Social Development (BNDES) to various sectors and companies in Brazil. These investments have been the subject of extensive research and analysis. Studies have shown that BNDES loans have a significant impact on company investments, amplifying the effects of cash flow on investments and reducing financial constraints typically faced by companies in developing countries.

For instance, the National Bank for Economic and Social Development (BNDES) is increasing credit by R$1.1 billion through the Fund for the Universalization of Telecommunications Services (FUST) to enhance broadband access in Brazil, with a particular focus on schools, rural areas, and favelas. This initiative, in collaboration with the Ministry of Communications, aims to address digital exclusion by financing projects that expand internet connectivity in underserved regions. The intervention involves both direct and indirect operations, with BNDES serving as the financial agent. The emphasis on favelas is part of a broader strategy to bridge the digital divide, reduce inequalities, and provide internet access to communities facing exclusion, aligning with the broader socio-economic development goals of the country.

Case study 14: Moradigna (Brazil)

Moradigna, a social impact housing initiative in Brazil, which addresses housing challenges in informal settlements. Operating as a non-profit organization, Moradigna focuses on enhancing affordable housing and social services for low-income families. The project emphasizes sustainable solutions by renovating homes to provide safe and comfortable living spaces. Handling material supply, management, and affordable labor, renovations are completed within five business days. Moradigna actively engages beneficiary communities, hiring local workers and fostering employment and income generation. Operating in São Paulo and Rio de Janeiro's East Zone, Moradigna has renovated over 800 houses, benefiting more than two thousand individuals. Supported by diverse financial resources, including donations, fundraising campaigns, and collaborations with social enterprises and government agencies, Moradigna exemplifies social entrepreneurship by not only mitigating the housing deficit but also promoting economic empowerment and improving residents' quality of life. This approach contributes to building savings capacity among vulnerable populations and diminishes the reliance on constructing informal dwellings in precarious settlements.

Case study 15: TerraNova (Brazil)

The approach of TerraNova involves the active participation of the private sector in the improvement of informal settlements, specifically through an innovative social enterprise. In this model, the private enterprise assumes the role of a coordinator and broker, orchestrating the regularization process for informal settlements. Its involvement includes negotiating discounted buyouts from underlying private landowners, managing titling and registration procedures for settlement occupants, and collaborating with municipal governments to facilitate infrastructure provision. By engaging the private sector, this approach introduces a fit-for-purpose land financing component, expanding the traditional fit-for-purpose land regularization concept. The social enterprise acts as a mediator, working to ensure the regularization of dwellings by facilitating affordable buyout arrangements, handling legal processes, and coordinating with authorities for necessary infrastructure development. The financial and operational strategy implemented by the private social enterprise reflects a sustainable business model. The enterprise enables residents to make affordable monthly payments over a specified period, ensuring the financial feasibility of the regularization process. The results, as evidenced by parcel-level repayment and pricing data, indicate the effectiveness of this private sector-led approach in improving the living conditions of informal settlements.

New challenges. From curative to preventive policies. What can be done?

Preventive policies: serviced lots

Upgrading informal settlements can be more cost-effective than resettlement in many cases. Studies have shown that upgrading can generate significant economic benefits, including increased property values, improved health outcomes, and reduced crime rates[9]. However, due to the high costs associated with upgrading, most low- and medium-income countries can only address the urban slum problem for a limited portion of their population. Even in relatively prosperous developing country cities like Rio de Janeiro, where slum upgrading has been emphasized, coverage remains limited compared to the overall population. The fundamental challenge lies in the high cost of retroactive fixing once slums have formed. Therefore, an effective strategy involves preventing or reducing informal settlement formation to avoid later costly interventions (Ferguson & Navarrete, 2003). This becomes especially critical as urban slum populations in low- and middle-income countries are projected to double in the next 25 years. Therefore, prioritizing the prevention of slum formation is crucial at various levels, from cities and states to entire countries.

In this regard, in a survey of 400 policy experts in Latin America, the feasibility of broadening land use and regulatory tools was explored. Experts evaluated various policy options, with infrastructure financing and serviced land production identified as most critical in a post-COVID-19 context. The survey also emphasized the importance of calibrating more realistic land use standards. Proactive strategies of this nature have been implemented in Brazilian cities and others, including Colombia, Argentina, Ecuador, and Uruguay (Goytia, 2021).

Nonetheless, many of these cities still prioritize a curative approach, employing diverse strategies to upgrade informal settlements. Studies reveal a significant challenge: upgrading interventions alone do not effectively reduce informality when there's an insufficient absorptive capacity in the formal sector shaped by the land use regulatory environment. Consequently, the effectiveness of these programs, even in cities with recent upgrading initiatives, is often questionable, as evidenced by continued informal growth in the years following the costly implementation of these upgrading programs.

9 Refer to the insights presented in the 'Lessons Learned from LAC Neighborhood Upgrading Programs' section, where key concepts have been highlighted and thoroughly discussed.

Case study 16: Urban Expansion Project (León Sureste, Nicaragua)

Since 1998, the city of León in Nicaragua has been implementing an innovative urban expansion project with seed capital provided by the municipality of Utrecht. This initiative aimed to generate serviced lots for low-income families at affordable prices with financing options. The sale of these lots creates a revolving fund that is systematically reinvested in new developments. Over 5,000 lots have been created, providing land for social projects, and relocating families from high-risk areas. This approach has transformed León into a city virtually free of informal settlements. The project also attracted private developers for social housing, and the formation of housing cooperatives was promoted. Lands were sold to private developers, resulting in an additional 750 lots, and other private entities in the expansion area capitalized on existing infrastructure to create another 730 lots. In total, 6,416 lots were developed in 15 years, benefiting around 32,000 people in a municipality with only 170,000 inhabitants. The urban expansion project demonstrates the feasibility of a municipally driven, economically sustainable, and long-term strategy to prevent informal settlements. It provides accessible land to low-income families, fosters partnerships with the private sector for planned and organized city growth, and creates synergies with entities responsible for basic service provision (Casas & Torner, 2017).

Case study 17: Trenque Lauquen (Buenos Aires, Argentina)

The municipality of Trenque Lauquen in Buenos Aires implemented an innovative land policy instrument known as parcel readjustment with public-private participation in 2011. This approach requires landowners in suburban areas to share the costs of extending mobility and service infrastructure. In exchange for relinquishing a portion of their property for street layouts and networks, landowners receive an urbanized parcel with services and access to the constructed roads. This instrument facilitates a public-private partnership. Trenque Lauquen's application of this mechanism in 2011 successfully engaged property owners in contributing to the financing of infrastructure required for the expansion of the urban perimeter (Alcocer et al., 2010).

Preventive policies: addressing climate change, green infrastructure, energy efficiency, and water consumption

Historically, socio-urban integration projects in Latin America have often overlooked the environmental dimension as a crucial component in territorial interventions. This oversight stems from the strong orientation of these projects, plans, and programs towards addressing urgent issues related to Unsatisfied Basic Needs (NBI) of the target populations. While prioritizing these needs is valid, it frequently results in missed opportunities for interventions where the environmental and socioeconomic dimensions could synergize. An illustrative example in this context is the implementation of Nature-Based Infrastructure (NBI) within the framework of Nature-Based Solutions (NBS), whose construction and maintenance typically yield a more significant positive impact on the well-being of populations and local economies than their conventional grey infrastructure counterparts (Hardoy et al., 2020; Kozak et al., 2020; 2022). This underscores the relevance of climate action.

In summary, climate action can be broadly categorized into two primary objectives. Firstly, there is the aim to contribute to mitigation, addressing the root causes of climate change (CC) by reducing Greenhouse Gas (GHG) emissions or enhancing their capture through green sinks. Secondly, there is a focus on adaptation strategies, addressing the consequences of CC by risk reduction and enhancing the climate resilience of communities. The planning and implementation of climate action measures in informal settlements of Latin America must align with the priorities of their inhabitants, such as creating sustainable employment and fostering inclusion. Climate action initiatives should not be perceived merely as supplementary measures to be considered only after resolving existing socio-economic urgencies but rather as effective pathways to address these urgencies; a route towards providing services and constructing urban environments with a quality of life. Vulnerability to climate change depends not only on adverse climatic conditions but also on society's ability to anticipate, confront, resist, and recover from associated impacts. Given that informal neighborhoods face higher risks compared to formal cities, improvement interventions conducted in collaboration with communities can lead to a condition of greater future resilience, facilitated by enhanced infrastructure functionality and resident training.

As showcased in "Ecological Design: Strategies for the Vulnerable City" (Vera et al., 2022), public space plays a fundamental role as a platform for civic action, exchange, and empowerment. When combined with green infrastructure, it becomes a means to enhance the social and environmental resilience of neighborhoods. In many cases, residents of spontaneous or informal settlements build and maintain their homes, but there is often a lack of initiatives to construct public spaces or ensure their maintenance due to their communal nature. This presents an opportunity for interventions that not only consolidate these common spaces and enhance their usability but also provide solutions based on green infrastructure, which are more resilient than traditional approaches.

Case study 18: Energy Efficiency Study in Vulnerable Neighborhoods (CABA, Argentina)

A recent study delves into energy consumption patterns within 38 households across diverse low-income neighborhoods in the City of Buenos Aires (CABA), Argentina: Barrio Playón de Chacarita, Barrio 20, and Valparaíso. The sample is categorized into two groups: Group A, encompassing newly constructed IVC homes with access to the gas network, and Group B, comprising self-built homes in the neighborhood blocks without formal access to public services, relying on informal connections to electrical and water networks, and lacking access to the natural gas network.

Primarily, the findings affirm, in alignment with prior research, the existence of seven critical energy services—referred to as "key consumptions"—accounting for nearly 80% of residential energy consumption in CABA households. These services include thermal conditioning (heating and cooling), hot water supply, cooking, and food preservation (refrigeration)[10]. The analysis underscores opportunities for substantial reductions, ranging from 30% to 50%, achievable through cost-effective measures. Central to this endeavor is the implementation of initiatives fostering rational and efficient energy use, leveraging educational programs (via schools, media, infographics, etc.), and facilitating citizen access to high-efficiency appliances (Goytia et al., 2023).

The study advocates the widespread adoption of heat pumps (air conditioning with inverter technology for both heating and cooling) as a viable alternative to electric or gas heaters, promising reductions in thermal conditioning consumption by factors of 3 to 5. Similarly, replacing HWS equipment with new Class A efficiency devices and gas water heaters with pilotless heaters (Class A) holds the potential for substantial savings ranging from 30% to 50%. In the realm of cooking, the introduction of thermal pots or "magic pots" is identified as a transformative measure, capable

10 In residences with access to natural gas (NG) via networks, the primary energy consumptions are attributed to heating, hot water supply (HWS), and cooking. Conversely, in areas without NG network access, cooking emerges as the predominant consumption, often reliant on bottled gas (Liquefied Petroleum Gas - LPG). Additionally, electrical consumption for HWS, thermal conditioning, food and beverage refrigeration, and lighting assumes secondary importance.

of slashing cooking-related consumption by 40% to 60%. Lastly, a targeted initiative to replace outdated refrigerators with more energy-efficient models could yield reductions exceeding 50%. Implementation of the identified measures could effectively bring household energy consumption in these neighborhoods below 150 kWh/month (or 1800 kWh/year), rendering a significant portion of their electrical consumption eligible for social tariffs (Goytia et al., 2023).

Across various demographic groups under scrutiny, it is evident that essential services can be sustained with 25% to 50% less energy. Advocating for these changes in energy usage proves advantageous, not only in terms of cost reduction but also in empowering households to allocate resources to other pressing needs, thereby adding substantial value to low-income families. Concurrently, the government stands to benefit from reduced expenditure on residential energy subsidies (Goytia et al., 2023).

Given the prevailing subsidy policy (at the time of this study), which inadvertently discourages the adoption of energy-efficient measures, there is a pressing need for the formulation of policies that actively promote and, in certain cases, even incentivize efficiency initiatives.

Case study 19: Morar Carioca Verde (Rio de Janeiro, Brazil)

Morar Carioca Verde is a groundbreaking urban development initiative in Rio de Janeiro, specifically in the Babilônia and Chapéu Mangueira hills. This pilot project, part of the broader Morar Carioca program, stands out for its innovative approach to addressing housing needs and environmental concerns in favelas. The initiative introduces sustainability as a core principle, exemplified by its alignment with the Casa Azul seal program. Rather than just providing housing, Morar Carioca Verde focuses on sustainable interventions, introducing novel elements like incentivizing waste collection through electricity bill discounts. This reflects a commitment to fostering environmental awareness within the community.

The project emphasizes multidisciplinary collaboration, involving various city departments and Caixa Econômica Federal. Caixa's Casa Azul seal plays a crucial role, providing technical subsidies for environmentally sustainable housing and certifying buildings. Social engagement is a key aspect, with a focus on minimizing conflicts and addressing community needs. Morar Carioca Verde has achieved notable success in enhancing urban quality and incorporating sustainable practices in construction, waste management, and public spaces. LED street lighting, solar water heating, rainwater reuse, and support for urban agriculture are among the project's sustainable features. The initiative's economic and environmental sustainability concept is community-centric, influencing daily life and public space management.

Originally conceived as a pilot, Morar Carioca Verde has transitioned into a disseminator of sustainable practices. It contributes to Rio de Janeiro's broader urbanization program, Morar Carioca, which aims to promote social inclusion through comprehensive urban planning for all favelas in the city. The success of Morar Carioca Verde positions it as a trailblazer, setting new standards for future urban interventions in similar contexts.

Case study 20: Barrio Moravia (Medellin, Colombia)

Moravia, initially established as a settlement in a strategic area of Medellín's riverbed extraction zone, faced significant socio-environmental challenges. In the 1970s, it became a municipal waste dump, attracting families displaced by armed conflict or drawn by Medellín's economic boom, relying on waste recycling for subsistence. By 2004, census data revealed Moravia's population residing on 10 hectares of land, atop a 35-meter-high mountain of 1.5 million tons of waste. The unstable terrain, steep slopes, fragile constructions, and the presence of industrial and domestic waste posed severe health risks.

In response, the "Project for the Comprehensive Intervention of Moravia and its Influence Area"

was initiated. Declared a public concern in 2006, it adopted a multifaceted strategy, addressing social, landscape, environmental, educational, and gender-related aspects. The social dimension aimed to enhance users' quality of life, rebuild community bonds, and reinforce identity. The landscape component focused on reclaiming the Morro de Moravia, transforming it into a cultural and scenic landmark using local flora and recycling. The environmental facet involved natural restoration through sustainable interventions, including bioremediation, phytotechnologies, buffer strips, and wetlands. The educational dimension is aimed at instilling values, equality, participation, and environmental awareness through workshops.

Moravia's environmental design adhered to water-sensitive urban principles, balancing water resources through ecosystem-based, low-cost technologies. The water management system included buffer strips for runoff pre-treatment and wetlands for treating leachates. Socially, the project fostered community engagement through Community Gardens, promoting empowerment, territorial identity, and social cohesion among residents. Moravia's transformation exemplifies a comprehensive approach to urban intervention, addressing environmental, social, and economic dimensions to create a sustainable and resilient community.

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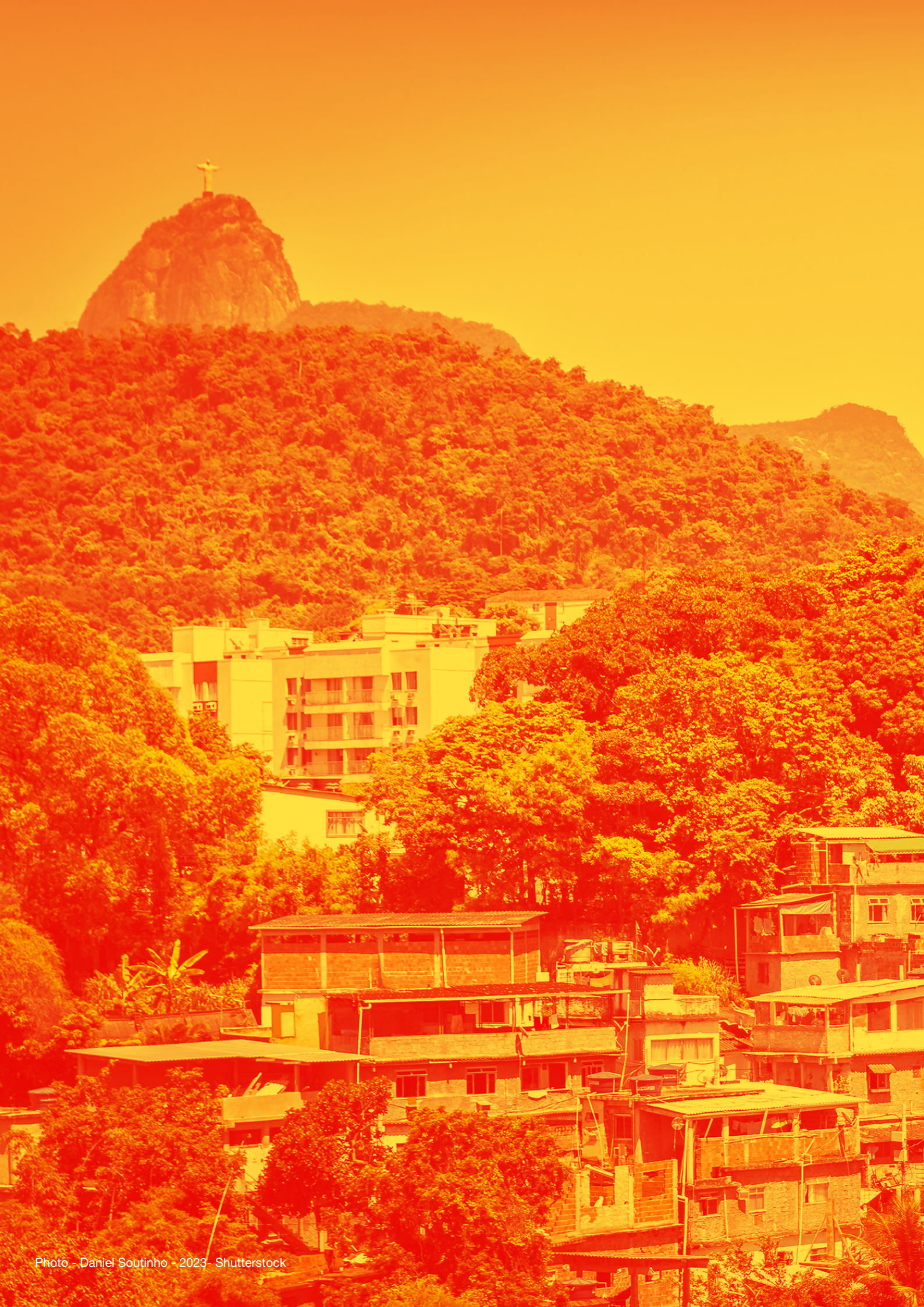

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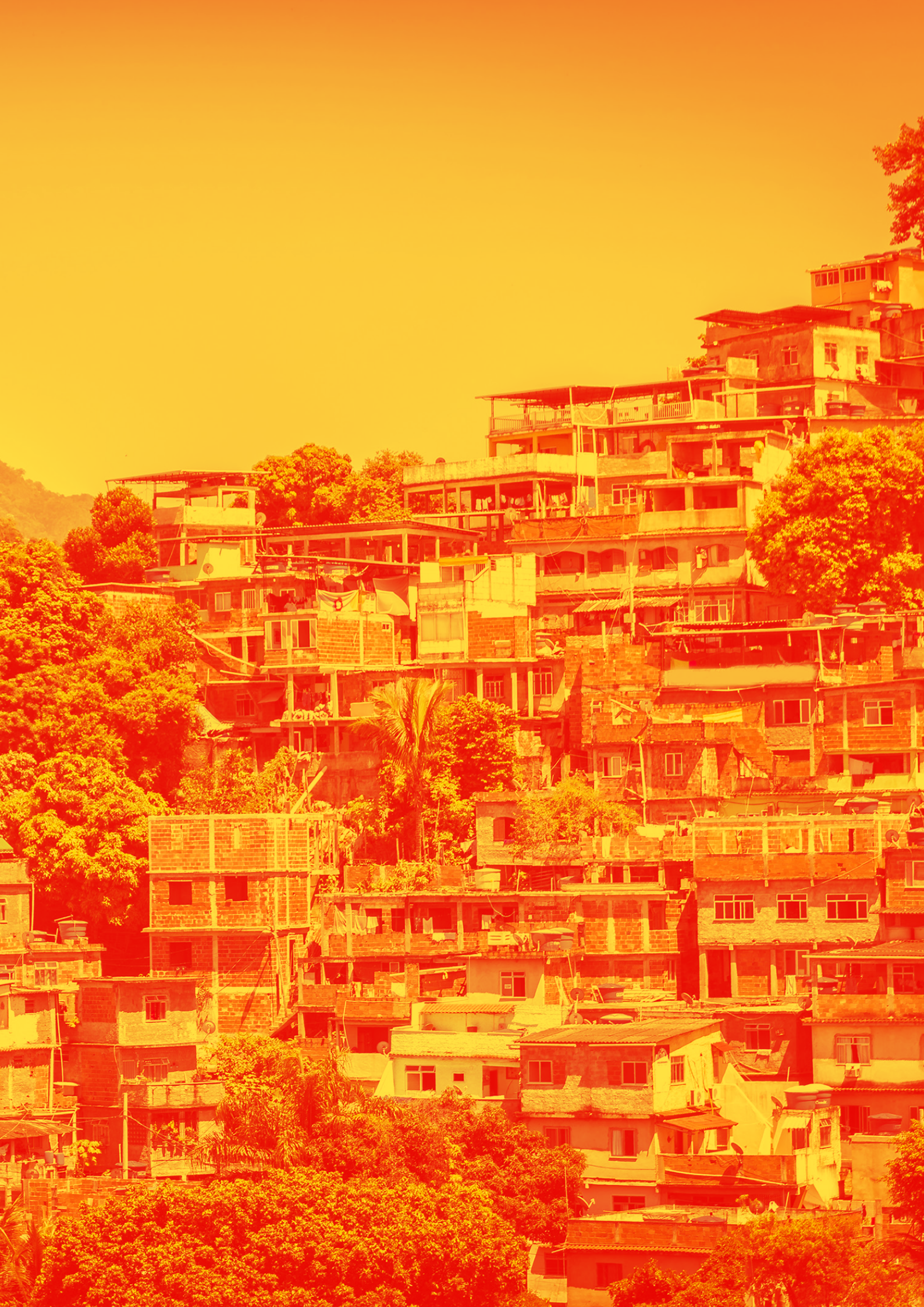

Urban and Municipal Development Fund
African Development Bank
CCIA Building | Avenue Jean Paul II, Plateau 01
Box 01 1387 | Abidjan, Côte d'Ivoire

www.afdb.org
umdf@afdb.org

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