







Community-Led Climate Adaptation in Informal Settlements



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AUTHORS

Wayne Shand, Senior Associate, International Institute for Environment and Development

Tim Ndezi, Director, Center for Community Initiatives, Tanzania

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in Informal Settlements

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Abbreviations

| ACCA | Asian Coalition for Community Action |
|-------|------------------------------------------------|
| ACHR | Asian Coalition for Housing Rights |
| СВА | Community-based adaptation |
| СВО | Community-based organization |
| CCI | Center for Community Initiatives |
| DMDP | Dar es Salaam Metropolitan Development Project |
| GCA | Global Commission on Adaptation |
| IPCC | Intergovernmental Panel on Climate Change |
| KISIP | Kenya Informal Settlements Improvement Project |
| LLA | Local-level adaptation |
| LMIC | Low- and middle-income country |
| MHT | Mahila Housing Trust |
| MSME | Micro, small, and medium-sized enterprises |
| NGO | Nongovernmental organization |
| PSUP | Participatory Slum Upgrading Program |
| RBF | Results-based financing |
| SEC | Settlement executive committee |
| SDI | Slum Dwellers International |
| SPA | Special planning area |
| TFUP | Tanzanian Federation for the Urban Poor |
| WASH | Water, sanitation, and hygiene |



Executive Summary

Purpose and Audience

This report examines the role of community-led climate adaptation in enhancing the inclusiveness, resilience, and sustainability of cities, focusing on rapidly growing informal settlements. The report is intended to inform the thinking of governments, donors, and World Bank staff in shaping urban program design. The evidence and case studies included in this report show how more inclusive approaches to urban adaptation are possible. By connecting strategic investment in infrastructure, driven by national and city governments, with mobilized grassroots action, more cost-effective and impactful urban climate adaptation can be achieved. But this will only be realized through a step change in policy, project design and implementation. Inclusive approaches, such as communityled data collection and the co-design of locally-led climate adaptation solutions with organized communities, embedded in project design, are essential. When deployed with innovative climate financing, such as Results-based Finance (RBF) (Box ES1), inclusive approaches can help bridge a significant climate financing gap for the most vulnerable underserved areas, strengthening institutions, and incentivizing and enabling new patterns of collaborative working.

Context for Community-led Adaptation

Two-thirds of the global population are projected to live in cities by 2050, creating an urgent need to focus climate adaptation on the places and people most at risk from climate change. Projections show that there will be an additional 2.2 billion urban dwellers by 2050, with about 90 percent of the population growth taking place in Asian and African cities. Improving the capacity of governments, communities, and businesses is essential to address the vast scale of need for sustainable urban development and adaptation to accelerating climate change.

People living in informal settlements are highly vulnerable to the effects of climate change. Over 1 billion people living in informal settlements are currently at risk because they reside in locations exposed to adverse weather conditions, with little access to basic services or infrastructure. Due to the deep effects of poverty and poor-quality living conditions, people in informal settlements lack the resources or ability to adapt to changing climates. However, the populations in urban informal settlements are the majority in many cities across the Global South and are essential stakeholders in building resilient futures.

The contexts for urban climate adaptation are highly complex, and tapping into the knowledge and experience of people in informal settlements is vital to shaping

effective investments. Overlapping locational factors and adverse socio-economic conditions contribute to vulnerability of the urban poor in informal settlements (figure ES1). However, these populations are severely under-represented in official data, with climate adaptation planning driven at the national and city level. A lack of disaggregated data and direct involvement by communities in the design of adaptation investments can result in poorly targeted interventions and missed opportunities to leverage climate adaptation to minimize the impacts of extreme weather events, protect vulnerable groups, reduce poverty, and preserve ecosystems.

Bottom-up approaches provide a solution to current climate planning and delivery systems that are ill-suited to cities under pressure from fast-paced urbanization. Integrating city-level infrastructure improvements with settlement upgrading will accelerate the delivery of climate adaptation. Enabling organized communities to partner with city governments would release capacity largely excluded from processes of urban adaptation, to reduce the vulnerability of settlements to worsening climate conditions.

Box ES1: Definition of Results-based Finance

RBF includes a range of financing mechanisms in which funds are linked to, and provided after, the delivery of pre-agreed and verified results. Instruments range from results-based aid for the delivery of strategic development targets by national governments to performance-based contracts to improve the outputs and effectiveness of services providers and impact bonds, in which an investor gets paid when agreed results are achieved. RBF has been used to strengthen institutional capacity, scale evidence-based programs, catalyze the adoption of promising programs and encourage outcomesoriented interventions.

Figure ES1: Drivers of Vulnerability are also Barriers to Climate Adaptation in Informal Settlements





Models of participatory slum upgrading and community-based adaptation demonstrate the transformative potential of collective action and collaboration with governments.

Communities Responding to Climate Change

Residents of informal urban settlements are exposed to a variety of overlapping climate risks, but they are not passive in responding to challenges. At a household level, people cope with climate shocks the best way they can, balancing recovery costs with meeting everyday needs. Collective action at a community level, through savings groups and local networks, is used to improve housing and reduce exposure to climate risks. However, as found in Dar es Salaam, while people can spend as much as one-third of their annual income on responding to climate conditions, long-term risk reduction requires complementary government investment in infrastructure, service improvements and tenure security.

Including organized communities in planning and delivering urban adaptation would encourage households to shift spending away from short-term coping and recovery to longer-term risk reduction. Redirecting household expenditure to complement public investment could help accelerate the positive impacts of climate adaptations, increase the resilience of settlements and reduce repeated short-term expenditure on recovery. RBF offers a mechanism to support this shift and incentivize connections between government and community level spending on climate adaptation.

Models of participatory slum upgrading and communitybased adaptation demonstrate the transformative potential of collective action and collaboration with

governments. These approaches put community leadership at the forefront, with decisions taken collectively and grounded in the priorities of residents. Informed by community-led data collection and lived experiences, incremental and in situ upgrading contribute to adaptation and reduced climate risks. Examples from across the globe show how community-led action, sometimes supported by partnerships with governments and donors, can make substantial improvements to informal settlements and the quality of life (Box ES2).

Box ES2: Community-led Settlement Upgrading

Asian Coalition for Community Action (ACCA) – provides a model of dispersed and community-led settlement improvement deployed across around 1,000 settlements, 165 cities and 19 countries in Asia. ACCA combined small grants to organized communities, matched by local savings, to deliver environmental improvements including sewers, drainage, community toilets, energy supply and housing upgrading. The initiative demonstrates the effectiveness of community-led action to deliver meaningful adaptations using small budgets and how aggregate impact can be achieved from dispersed actions.

UN-Habitat PSUP Jamestown (Ga-Mashie) Lowincome Settlements in Accra, Ghana – devolved around 10 percent of the Participatory Slum Upgrading Program (PSUP) budget to communities to deliver local priority upgrading. In Accra, the project in Jamestown improved public spaces, drainage, walkways, public toilet and shower houses. The improvements were designed and delivered by communities, under the supervision of the city council, reducing flooding and improving sanitation. Completed before COVID-19, the improved WASH facilities made a major difference to public health during the pandemic. Collective and community-led action builds the capacity and confidence of residents to upgrade and

adapt settlements. Engaging and mobilizing community members, undertaking participatory data collection, and creating decision-making structures build the networks and skills for communities to lead adaptation actions. Combined with supportive funding and technical expertise from local government and community-based nongovernmental organizations (NGOs), grassroots groups can be active participants in the design and delivery of climate adaptation. This capacity is vital to build bottom-up action and needs to be fully recognized as part of the process of urban development and integrated into structures of governance within cities.

Community-led data collection can be a starting point to engage with slum dwellers and collect disaggregated data for better targeting and delivery of climate adaptation

programs. Commissioning community-led data collection can be an effective way to establish a relationship with leaders and residents of informal settlements and gain new insights into the contexts and conditions for project delivery. It adds value to standard engagement and World Bank project context analysis by drilling down spatially into targeted settlements and exploring perceptions, experiences, and local responses to adverse environmental, economic or climate conditions. Community-led data collection is scalable, flexible, and adaptable to changing conditions, such as epidemics and pandemics. Lastly, early engagement of organized communities is important to define specific data gaps and the need for additional data collection.

Financing and Enabling Community-led Adaptation

While levels of global climate finance are increasing, there remains a major gap in resources, with insufficient funds directed at informal settlements. The value and flow of climate finance needs to better reflect the scale and complexity of the climate challenge in Global South cities. Analysis by Cities Alliance of 22 global climate funds operating between 2003 and 2023, shows that just 2.1 percent of all projects and 3.5 percent of approved budgets targeted informal settlements and the urban poor in the Global South. While some climate funding may be directed by national and local governments to poor urban residents, there is clearly a large gap in targeting the groups most vulnerable to climate change and in the reporting systems that track allocations of budgets.

The structures governing the flow of finance create barriers that limit community-level access to funding.

Donor perceptions about community-based organizations (CBOs) and processes of allocating and managing funding can prevent grassroots groups from accessing resources and being part of decision-making arrangements (Figure ES2). These systems are a major impediment to putting the principles of local-level adaptation (LLA) into place. Implementing community-led climate adaptation requires structures that are responsive to the capacity and roles of community-level groups.



Figure ES2: Barriers to Financing Community-Level Adaptation Action

Power and perceptions—unequal levels of authority, decision-making cultures, and pre-conceived ideas about what CBOs can and should do, shape the willingness of governments and donors to direct resources to communities.

Risk and accountability—donor requirements for reporting and finance systems and the use of competitive selection processes are barriers to participation by community-based groups and may inhibit innovation.

Grant values and timescales—large funding packages that have limited scope for capacity building, with delivery over timescales that do not allow for full engagement of communities are barriers to inclusive project delivery.

Box ES3: Examples of Community-led Action

Kenya – Community Upgrading Plans - as part of the Kenya Informal Settlements Improvement Project (KISIP), settlement executive committees (SEC) were a prerequisite to ensure that upgrading plans reflected the priorities of communities. SECs had representatives of youth, business community, women groups, disabled, religious groups, local professionals (i.e., teachers), landlords, tenants, and local members of county assembly. SECs as local-level structures were responsible for community mobilization, linking residents to programme managers and contractors, facilitating household censuses (enumerations) and the production of settlement upgrading plans. **Viet Nam** – Household Investment in Climate Adaptation - The Mekong Delta Region Urban Upgrading Project sought to induce household investment through voluntary financial and land contributions to improvements and, indirectly, ownaccount investment in housing. While seeking voluntary contributions had limited success over the life of the program, the settlement improvements coincided with occupier investment in properties. An end-of -project survey shows that nearly half of households surveyed (41.9 percent) had upgraded their house and that the proportion of homes built with temporary materials (such as corregated zinc sheets) had decreased from 29.2 percent to 4.9 percent.

The World Bank, through its Integrated Urban Development Programs, has extensive experience with community engagement, which can be used to support **community-led climate adaptation.** As part of stakeholder planning and community engagement, the World Bank often sets up consultative committees to feed into the design of project delivery. In some cases, communities are funded by the World Bank to collect local data, define priorities, and develop urban upgrading plans (Box ES3). These provide a foundation to further extend the role of communities, looking deeper into environmental, social, and economic conditions within settlements and including community leaders in decision-making structures. The use of grant and RBF funding can be tailored to build capacity and shape collaboration between local governments and residents of informal settlements.

Evidence from World Bank programs shows that incentives and devolution of responsibilities can have a positive impact on investments. Creating incentives for household investment in climate adaptation by improving tenure security and leveraging improvements in infrastructure can help increase the level of community and private expenditure in settlements. In Indonesia (the National Slum Upgrading Project), found contracting directly with community organisations and small businesses cost less than delivery through local government contractors and led to greater local ownership of improvements. Small grant budgets for local works, such as in the Viet Nam Mekong Delta project, produced community-led planting, solid waste collection and environmental awareness courses, contributing adaptation benefits (Box ES3 above).

The use of flexible RBF instruments can help expand community-led adaptation. Either linked to major grant programs or used tactically to address institutional or financial obstacles, RBF can provide an important resource for community-led action. When applied to informal settlements, RBF can support community-led adaptation, but it is not suitable in all contexts. Table ES1 shows how RBF can help shift expectations and behaviors to support the delivery of community-led adaptation actions, but should also build capacity to deliver results (in both communities and local governments), with funding tailored to reflect the financial position of community-based groups.

Table ES1: Benefits and Barriers—Results-Based Finance for Community-led Adaptation

| Benefits of Results-Based Finance | Barriers to Results-Based Finance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Focus on outcomes —enhances accountability of government and service providers to communities. | Requires upfront funding —may deter community-led organizations and require significant up-front payments. |
| Emphasis on blended funding —creates space to include private-sector and community funds (e.g., savings and utility company customer revenue). | Needs supportive institutions —may be difficult to implement RBF where settlements lack official recognition. |
| Closing market and service gaps —removes cost barriers to service provision extended into low-income areas. | Complex to set up —particularly where there is contested land ownership or performance targets are hard to deliver. |
| Verification systems —strengthens local level data collection, when combined with community enumerations. | Needs good public administration —and the capacity to effectively develop and manage contracts. |
| Integrated learning —encourages experimentation and use of local knowledge to design bespoke local adaptation solutions. | Needs responsive private sector —requires existing market capacity among micro, small, and medium enterprises (MSME) as providers and specialist contractors. |

RBF has been used in urban contexts for institutional strengthening and extending basic service coverage to informal settlements. World Bank experience of improving the administrative processes for land registry in the West Bank, subsidy payments to enable connections to electricity networks in Zambia, and performance rewards made to community groups for improved solid waste collections in Jamaica demonstrate the benefits of RBF in delivering community-led climate adaptation.





Box ES4: Spotlight on Dar es Salaam

As part of this project, a community-led data collection pilot was undertaken in two informal settlements in Dar es Salaam from May to July 2024. The pilot generated evidence for this report, but also demonstrated the added value of community-led data collection to understanding and planing for climate adaptation. The research was undertaken by Center for Community Initiatives (CCI), a Tanzanian NGO working on urban development issues and the Tanzania Federation for the Urban Poor (TFUP) a grassroots group organising residents of informal settlements. It sought to understand the experience and impact of climate change and residents' coping strategies.

The research highlighted the deep vulnerability of residents of informal settlements. Overlapping issues of poverty, poor quality housing and settlements exposed people to flooding, extreme heat and high winds, with major impacts on health and livelihoods. The pilot showed how cycles of climate shocks, led to an inability to fully recover and a gradual eroding of savings that increased the vulnerability of residents. Residents of settlements are locked into patterns of short-term coping and recovery, which undermine their adaptive capacity. Despite residents spending up to one third their annual income on coping with climate conditions, they lacked the knowlede or financial ability to reduce long-term exposure to climate conditions. While individuals and collective groups sought to reduce climate risks through measures such as raising floor levels of dwellings to reduce flooding and drinking more water during hot spells, they needed partnership with local government to make a substantive improvement to their conditions.

The community research highlighted how issues of climate risk, poverty, health and infrastructure are connected and the importance of collaboration with the local authority. The evidence produced recommendations from the community to improve drainage, green the settlement, increase the resielince of housing that can be taken forward by the community. The pilot provides evidence to infom the World Bank Dar es Salaam Metropolitan Development Project (DMDP) phase 2 and more widely demonstrates a model of community-led data collection that is scalable and transferable to other project contexts.



Erosion of the Msimbazi River

Putting Community-led Adaptation into Practice

While there are clear advantages to community-led climate adaptation in informal settlements, established methods of project design and delivery often leave little space for communities to have a meaningful role. Bringing together communities and governments is vital and urgent to address the growing climate risks in cities. The World Bank has an important role in making this happen, using its relationships with governments and resources to encourage, incentivize, and enable new patterns of working and collaboration that bring in communities as full stakeholders in urban climate adaptation. A key part of this is the use of RBF to improve information flow to enhance the targeting of interventions, creating an institutional environment for community-local government collaboration to flourish and supporting capacity for delivery.

Understanding the context is vital. Effective planning and delivery rely on disaggregated and accurate local data. Organized communities have a vital role as holders of information not captured in official statistics. Bringing information on informal settlements into the planning and management of adaptation initiatives can improve impact and help mobilize and empower communities to take action. RBF as a flexible fund can be used for grant, performance, and incentive payments to integrate community-led data collection into urban projects (Table ES2).

| Objective | Results-Based Finance |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand the context and interdependences of climate, socio-economic, and institutional factors. | Grant funding for community-led data collection, targeting and engaging the most vulnerable groups. |
| Build capacity of grassroots networks to co-ordinate community engagement and lead adaptation delivery. | Performance-based funding to develop the capacity and technical skills of local stakeholders (including local governments) and grassroots and NGO groups. |
| Shift the use of short-term household expenditure on recovery into investments that increase resilience to climate conditions. | Incentivizing household investment in housing improvements or extending and using improved infrastructure. |

Table ES2: Using RBF to Enable Community-led Action

Positive partnerships enable community-led climate

adaptation. With relationships between communities and local governments often defined by policy and regulation, creating conducive institutional conditions for community-led action is an important foundation. Ingrained negative perceptions, on both sides, and a lack of experience of joint working are disincentives to collaboration. Even when there is a will to look at more inclusive approaches to urban development, a lack of capacity to engage, politicized

institutional processes, and insufficient data on informal settlements are barriers to strengthening relationships. Examples such as Mukuru in Nairobi, Kenya show how positive institutional arrangements work to create space for communities to mobilize, fill data gaps, and work collectively with local government to deliver settlement upgrading. But these need to be fostered to be effective. Table ES3 provides some examples of how RBF could help create a positive environment.

Table ES3: Using RBF to Improve the Institutional Environment

| Objective | Results-Based Finance |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Institutional strengthening of local governments, for example, in land administration. | Capacity building and performance payments for the completed transfers of land rights. |
| Build governance structures that enable local governments and organized communities to collectively prioritize investment. | Incentivize the creation of project boards with equal representation from local governments and communities. |
| Establish contracting arrangements that give delivery responsibility to communities. | De-risk local government contracting arrangements to encourage devolved community-led delivery. |

Testing community-led action is the best way to demonstrate the effectiveness of devolved delivery. Designing community-led delivery and collaboration needs to be a process of co-production. Discussions and negotiations between local governments and communities to design joint delivery plans are an effective way to define inputs to delivery. Table ES4 shows examples of how RBF can be used to ensure a focus on the key outputs and incentivize local contracting.

Table ES4: Using RBF to Enable Community-led Delivery

| Objective | Results-Based Finance |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Climate adaptations meet identified local needs. | Performance payments and rewards for adaptation to climate risks. |
| Adaptation is at a scale that can be managed by communities, without reducing overall impact. | Incentivize or subsidize community-led small delivery contracts. |
| Community-led action is sustainable over the long term. | Performance-based contracting, linked to operation and maintenance, ensures the involvement of organized communities. |

Cities and informal settlements face an uncertain future.

Unplanned urbanization, worsening climate conditions, and rigid finance and governance systems create difficult circumstances to deliver sustainable urban development. However, the climate risks to billions of people across the world make action essential. Using the combined strength of the public, business, and community sectors, working together in their own contexts can create the momentum to build resilient and inclusive cities for all.



1. Introduction

1.1 The Challenge of Climate Change

Rising global temperatures pose a major threat to the lives and well-being of populations across the world. With between 3.3 billion and 3.6 billion people currently living in contexts that are highly vulnerable to climate change,¹ global warming to 1.5°C above pre-industrial levels by 2030 could expose almost half the world's population to extreme climate hazards.² There is clear evidence that low- and middle-income countries (LMICs) will be disproportionately affected by climate change. People in Sub-Saharan Africa and South Asia are most at risk because of lower income levels, a lack of access to riskreducing basic infrastructure, such as drainage and energy, and essential social services, such as health care, needed to cope with, and recover from, shocks. ³ The density of informal settlements, the reduction in green environments, and poorly insulated and ventilated housing exposes urban dwellers to rising temperatures.

Growing cities will be significantly impacted by climate

change. The share of global populations in urban areas is expected to rise from 56 percent to 68 percent⁴ over the next three decades, with an additional 2.2 billion people living in cities by 2050. About 90 percent of this growth will take place in Asia and Africa.⁵ Approximately half the growth in urban populations will result from regional and internal migration.⁶ Growing populations will increase pressure on urban land use and access to services in cities already unable to respond or raise revenue to get ahead of demand. Higher population density is likely to increase unplanned development, with a lack of infrastructure deepening the vulnerability of low-income communities.

Patterns of urban growth over the last 30 years have resulted in large-scale informal settlements across the Global South. The occupation and unplanned development of marginal land, along coasts, floodplains on steep slopes, urban dump sites, and other sensitive areas has placed populations at great risk from changing climate conditions. The process of informal settlement has degraded natural ecosystems, such as mangroves,⁷ and the absence of infrastructure to protect communities has substantially increased exposure to adverse weather events.

The density of informal settlements, the reduction in green environments, and poorly insulated and ventilated housing exposes urban dwellers to rising temperatures. Evidence from the Intergovernmental Panel on Climate Change (IPCC) indicates that the number of cities with summertime temperatures of 35oC and above will triple by 2050,⁸ creating significant risks to the well-being of people. Poor urban design has led to the creation of heat islands in cities that disproportionately affect the health of young children, the elderly, and people with disabilities.⁹





Despite contributing least to the climate crisis, developing countries, especially informal settlements in cities, will face major challenges to adapt to new climate realities.

1.2 The Need for an Inclusive Approach to Climate Adaptation

Despite contributing least to the climate crisis, developing countries, especially informal settlements in cities, will face major challenges to adapt to new climate realities. With planning for climate change primarily taking place at national levels (through Nationally Determined Contributions and National Adaptation Plans) and through the climate action plans of a relatively small number of major cities, governments rarely consider the potential contribution of communities to climate change adaptation. A national focus can obscure the specific impacts of changing weather conditions on vulnerable communities and lead to gaps in adaptation strategies and investment plans.¹⁰ To avoid maladaptation, cities and their communities must invest and adapt in ways that are inclusive and sustainable, reducing long-term exposure to climate risk as a shared mission of all urban stakeholders.

National finance and decision making for climate action must be devolved to the local level, where vulnerability and long-term risk are greatest. To meet the vast cost of urban adaptation, sources of finance and action need to diversify to integrate the inputs of government, communities, and businesses working together. Donor and domestic finance systems are often mismatched to the pressing needs created by climate change and the complexities of urban environments.¹¹ But national climate strategy and infrastructure investment can be enhanced so that communities are part of the solution and able to use their local knowledge of risk to link household and collective action to wider programs of settlement upgrading and adaptation.

Cities have limited finances and capacity to drive and deliver adaptation. Better alignment of existing resources and use of flexible funds, such as RBF, can support institutional and grassroots capacity building and action. RBF can complement major grant programs and focus on specific barriers preventing inclusive approaches to climate adaptation. Deploying RBF to fund innovation and focus on outcomes will be essential to shift away from 'business-as-usual' approaches and to include communities in informal settlements as full stakeholders in creating sustainable cities.

1.3 Objective and Structure of the Report

This report contributes to ongoing discussions on climate adaptation, focusing on the urgent need to encourage community leadership in informal settlements and use the full palate of available climate and development resources. It is aimed at governments, donors, NGOs, and World Bank staff working on urban climate adaptation, development, and disaster risk management. The report highlights how support for community-led adaptation can catalyze the transformation of informal settlements. While much can be achieved through shifting the established ways that governments work with communities, by integrating settlement-level action into urban programming, flexible funding, such as RBF, will be essential to create capacity and incentivize actions to embed more inclusive approaches in planning and delivery of climate adaptation strategies.

The report is structured as follows. First, it provides background analysis on cities and climate change, focusing on the vulnerabilities of informal settlements. Examples of community-led adaptation are then provided to illustrate the diversity of local action to address climate risks, followed by a discussion of financing communityled climate adaptation. The report then turns to the experience of the World Bank to identify how communities are included in urban projects. The report then focuses on how community-led approaches can be put into practice to drive impactful and lasting change in informal settlements, followed by a conclusion.

Each of the main chapters is followed by a Spotlight, drawing from community-led data collection piloted in two informal settlements in Dar es Salaam, to feed into this report. The Spotlight sections highlight local-level vulnerabilities and barriers to building adaptive capacity, providing evidence of need and identifying actions that could be taken by communities and city governments to reduce climate risks. The pilot aims to demonstrate the value of community-led data collection and its potential use and scalability to World Bank projects.

2. Urban Informal Settlements and Climate Change

Informal settlement has been the dominant form of urban growth across the Global South during the last 30 years.

As city populations have expanded and people have migrated to urban areas, driven by a search for economic opportunity or refuge, informal settlements have provided the entry point to a home in the city. However, the lack of planning, basic service infrastructure, tenure security, and construction standards in these communities has created a legacy of vulnerability to climate change. This chapter provides an outline of the characteristics of informal settlements to highlight the implications of changing climate conditions for urban populations across the Global South. Pressure for land, where there is limited public governance capacity, has resulted in large informal settlements in cities across the Global South.

2.1 Global Urban Context

The number of people living in cities has increased fourfold over the last 50 years,¹² driven by natural growth of established populations, the migration of people to cities from rural areas, and displacement caused by conflict and climate change. The International Organization for Migration and UN-Habitat estimate¹³ that about half of urban growth in Global South cities will be driven by migration, including internally displaced populations and refugees. Cities are centers of economic activity that attract people, offering opportunities to find employment, relative safety, and an ability to meet essential needs more than in rural or semi-rural areas.

The majority of urban population growth will occur in Asian and African cities. All global regions are expected to experience urbanization, but with notable differences between developed and developing countries. As noted above, projections suggest that of the additional 2.2 billion people expected to live in urban areas by 2050, about 90 percent will be in Asian and African cities. The rate of growth is likely to be slower in highly urbanized and developed regions, such as Latin America, the Caribbean, and Northern America, where 80 percent of populations already live in urban centers.¹⁴

Over the next three decades, cities of all sizes will see significant population growth. While global policy often focuses on the rising number of megacities of 10 million or more people in Asia, Africa, and Latin America, a majority of urban populations will continue to live in smaller cities of less than 1 million people.¹⁵ To cope with growing numbers of residents, all cities will require strategies to manage pressures of urbanization on increased demand for land, infrastructure, and services. Given the scale of informal settlements in urban areas, these communities need to be part of the solution through programs of in situ improvements. Upgrading and new development must follow a low carbon path, to avoid increasing greenhouse gas emissions that may undermine progress toward global targets.¹⁶



Pressure for land, where there is limited public governance capacity, has resulted in large informal settlements in cities across the Global South. The dominant form of urban development in cities of the Global South is informal settlement.¹⁷ The term 'informal settlement' is commonly used to refer to any form of housing where occupants do not have legal claim to the land they live on and that falls outside government control or regulations.¹⁸ This may incorporate some 'slum' areas (as targeted in SDG 11),¹⁹ which are defined principally in respect to their access to improved water, access to improved sanitation, sufficient living area, durability of housing, and security of tenure, rather than the legality of the settlement. **Global data indicate that about one in four people in urban areas live in slum conditions.** Some 1.1 billion people in cities lack access to quality housing and basic services and experience poverty. The presence of urban slums varies significantly by region, with Sub-Saharan Africa showing the highest proportions of people living in such areas (Figure 1). Informal and slum settlements attract low- income and migrant populations because of their proximity to economic centers and lower cost housing relative to expensive city center property.²⁰ While long-term trends have seen a fall in the proportion of people living in informal settlements, increasing urbanization means that the total number of people in these communities is growing.²¹



Figure 1: Proportion of Urban Populations Living in Slums, Selected Regions 2018²²

*Excludes Australia and New Zealand

Source: Reproduced from UN Statistics Division (2024)



Informal and slum settlements have expanded incrementally to meet demand for living space, often in unsuitable and hazardous locations in cities. These settlements are frequently located in environmentally degraded and at-risk areas, such as on municipal dump sites, hillsides, and river flood plains. They typically lack access to basic infrastructure (e.g., roads, water, sanitation, electricity), and dwellings are constructed of materials that provide little integrity or protection from adverse weather conditions. These factors make residents vulnerable to extreme climate events and risks from compounding crises of conflict and health emergencies (Box 1).²³

Box 1. Compounding Effects

During the first year of COVID-19, some 92 extreme weather events exposed 51.6 million people globally to overlapping threats from floods, droughts, or storms. These events worsened the effects of the pandemic for low-income populations. While the characteristics of each informal settlement are specific to the cities in which they are located, environmental risks, a lack of service infrastructure, and poor-quality construction are typical features across the globe. Informal settlements are as heterogeneous as any other part of large cities,²⁴ but share common conditions of poverty and risks from adverse weather. Residents of informal settlements typically work in the informal economy, which provides the principal source of income for a majority of people living in the Global South.²⁵ Moreover, dwellings in informal settlements often have multiple uses to leverage their value as assets-for enterprise, rental of space, and storage. Where properties are affected by climate change, the impact can result in a devastating loss of not only possessions but also livelihoods. Informal settlements are a key part of the fabric of cities and should be fully integrated into plans for urban development to reduce risks and climate impacts, as discussed below.²⁶



2.2 Climate Change and Cities

Cities and informal urban settlements face disproportionate risks and impacts from climate change.

The form of urban development, the location of settlements within cities, limited infrastructure and the interlinked issue of poverty, which reduces the adaptive capacity of low-income households, expose people to changing climate conditions.²⁷ Climate risks do not occur in isolation, but are compounded by environmental, social, and economic conditions, with a broad range of effects on health, livelihoods, and well-being.²⁸

Informal settlements in marginal or precarious locations face climate risks from floods, landslides, and storms.

Cities located in the low-lying coastal and delta regions, such as those in Guyana, Maldives, Belize, Suriname, Tanzania, Kenya, Thailand, and Bahrain, at an elevation of less than 10 meters above sea level, face major risks of flooding and erosion.^{29 30} Periods of high and intense rainfall lead to flooding of low-lying informal settlements that lack functional infrastructure. Excess waste in rivers and drainage channels can block watercourses, causing flooding of settlements. Communities located on steep hillsides and municipal dump sites can face catastrophic risk of landslides, causing loss of life and destruction of homes, from water saturation of land (Box 2).³¹

The density of informal settlements and the erosion of natural environments increases exposure to high temperatures, causing thermal inequality — the unequal distribution of heat exposure and its impacts across communities within urban areas. Rising pressure on land increases the sub-division of plots and the density and overcrowding of settlements. Green space, mangroves, and trees are removed to accommodate buildings, which degrades natural defenses against climate events in the city. Rising global temperatures have a pervasive impact on settlements, where a lack of shade, the use of low-quality building materials, and industrial activity contribute to heat island effects. Urban poor and displaced persons, along with very young and elderly people and individuals with

Box 2: Impact of High Rainfall

In 2017, after 3 days of intense rainfall a major landslip occurred in the western rural and urban Freetown areas of Sierra Leone. The landslip caused massive damage and exacerbated existing flooding, affecting around 6,000 people, with 1,141 recorded as dead or missing. Dwellings in informal settlements were disproportionately affected, both due to their location on steep slopes in the path of the landslip and the low durability of building materials. Alongside physical damage there were serious economic impacts, with livelihoods destroyed and the wide effect of the disaster undermining community and collective coping mechanisms.

disabilities or chronic health conditions, are particularly vulnerable to extreme heat.³² Studies have shown that housing occupied by low-income communities in South Africa can have indoor temperatures between 4–5oC higher than outdoor temperatures.³³ In Makassar, Indonesia, temperatures in informal settlements averaged 2.6oC higher than surrounding areas.³⁴

The use of low-quality building materials reduces the climate resilience of housing in informal settlements. The methods and materials used for housing construction offer little protection from flooding, high winds, and heatwaves, exposing residents to climate risks. Materials such as tin, cement, and cinder or clay bricks used to construct dwellings, have limited resilience and, relative to low and unstable incomes, are expensive to purchase and transport into informal areas that lack access roads.³⁵ Constructing housing incrementally, relying on earnings and savings, can be a long-term effort that absorbs a large proportion of incomes, but produces dwellings that remain highly vulnerable to changing climate conditions.

The lack of basic service infrastructure in informal settlements exacerbates risks from adverse weather

events. The resilience of city dwellers to climate change is conditioned by access to risk-reducing infrastructure, which is generally available in developed countries, but largely absent for poor populations in LMICs.³⁶ The presence of basic service infrastructure, including functional sanitation, drainage, and household waste collection, alongside affordable building construction standards, are important to create a basis for adaptation to minimize the risks of climate change.

Environmental and socio-economic conditions determine vulnerability to climate change, but these factors can also be barriers to climate adaptation. The

challenges associated with environmental conditions not only intersect with, and exacerbate, socio-economic factors but are a constraint to adaptation (Figure 2). The conditions found in informal settlements increase the difficulty and cost of adaptation to climate change and can be barriers to investment by donors and the private sector. The complexity of informal settlements requires a 'business *un*usual'³⁷ approach to bring together stakeholder partnerships and the resources needed to deliver sustainable and equitable urban climate adaptation.

These complex conditions require full consideration not only of the drivers of vulnerability but also of the barriers to adaptation. The characteristics of informal settlements can have multiple implications for communities and the design and delivery of improvements (Table 1). Often, solutions are far from straightforward, requiring detailed local information and contextual analysis of factors, to determine the most effective and equitable means of reducing risks. In the absence of detailed official spatial and non-spatial information on demographics, socio-economic profile, basic services, and housing and environmental conditions, residents are the primary source of knowledge. When there are weak governance systems or adversarial relationships between government and populations in informal settlements, the ability to deliver improvements is not possible without first establishing relationships and dialogue. Communities are not only beneficiaries of adaptation improvements but also stakeholders essential to the process of undertaking and realizing the benefits of urban development investments.

Figure 2: Drivers of Vulnerability are also Barriers to Climate Adaptation in Informal Settlements³⁸



| Characteristic | Implications for Climate Risk |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location of settlements | Marginal and at-risk locations increase the difficulty and costs of adaptation and upgrading. Settlements are often on sites that are unsuitable for housing because of environmental factors (e.g., landslides, flooding, coastal erosion). |
| Household poverty | Multi-dimensional poverty compounds vulnerability to climate risks. Where climate shocks hit, losses can diminish financial stability and resilience, reducing the ability to cope with changing climate conditions. |
| Building quality and settlement configuration | Construction materials may have little structural integrity, and homes may require rebuilding rather than adaptation, increasing costs and difficulty. Unplanned settlements make access problematic, and settlements may need to be reconfigured to allow installation of infrastructure and in situ climate adaptation. |
| Lack of tenure security | The lack of legal status deters investment by both landlords and tenants to adapt dwellings. Contested ownership is a barrier to investment for donors and the private sector. The illegal/ informal status of settlements is used to justify excluding these communities from involvement in local government climate planning and city development. |
| Basic services and infrastructure | Lack of access to services and infrastructure (e.g., water, sanitation, drainage, roads, energy supply) increases the vulnerability of settlements and the costs of adaptation actions. Weak commercial models for utilities ³⁹ in informal settlements limit investment options. |
| Unstable work and income | Reliance on informal employment produces low and unstable incomes that reduce the ability of people to invest in adaptation or to afford and move to better and safer areas of the city that are close to places of work and markets. |
| Loss of natural environments | The absence of green space and trees and impervious surfaces contributes to heat island effects and reduces the resilience of the environment to flooding and storm conditions. |
| Information deficit | Limited access to disaggregated data (e.g., scientific, geospatial, qualitative) on climate risk and early-warning systems for informal settlements make planning of adaptation difficult for governments, donors, and community members. |

Table 1: Characteristics of Informal Settlements and Implications for Climate Risk

2.3 Data Gaps on Climate and Informal Settlements

Informal settlements in cities, despite often housing a majority of urban populations,⁴⁰ are poorly represented in official statistics and datasets.⁴¹ There are significant gaps in data coverage, which limits the planning of inclusive development and climate adaptation. This leads to a concentration of climate adaptations in more formal urban areas where data is available or to infrastructure solutions that may have negative impacts on poor and marginalized communities.⁴² The ability to target vulnerable populations and track the changing conditions at the settlement and household level is vital to ensure that resources are being used efficiently to reduce climate risks and have a positive economic impact on low-income households. The absence of this capacity has led to patchworks of urban improvements, leaving many of the poorest residents behind.

The gaps in disaggregated data covering urban informal settlements were evident during the COVID-19 pandemic.

The lack of spatial data on informal settlements, their populations, and the levels of access to service provision increased the difficulty of tracking the virus and managing the effectiveness of public health measures. The crisis conditions did, however, encourage new patterns of working and innovation in sharing and use of data, with organized communities collecting data and disseminating public information (Box 3) and health agencies repurposing client information to help efforts.^{43 44 45 46}

Alongside gaps in data, scientific knowledge on climate change is not connected to community-based information, which could identify the effects of weather conditions on the health and well-being of low-income populations. Linking data sources is vital to frame and evaluate the impact of interventions on vulnerable communities. Participatory forms of data collection can improve the allocation and targeting of resources from public programs to residents of informal settlements and inform the design of city development and adaptation programs. Aligning official and local enumeration data can help address gaps in the coverage or frequency of public census and administrative information to provide a more accurate picture of the needs of marginalized communities. Combining official and scientific data with communityled household surveys can improve the use of existing information to identify vulnerabilities and support more effective targeting of interventions.

Box 3: Data Collection

Social Networks during COVID-19

Community-based organizations were vital during the pandemic, filling gaps in official data and providing access to vulnerable populations in informal settlements. Public health institutions mobilized social networks to map contagion risk hotspots and collect information on the impacts of the pandemic in communities, which enabled targeting of health responses. They were also used to disseminate information, distribute personal protection equipment, and target food and medicines to affected groups. Social networks proved their importance to enable the effective functioning of city-wide health responses.

Weather Early Warning

In Uganda and Tanzania, the Daraja project is providing simplified weather forecast information to residents in informal settlements to help them prepare for adverse conditions. National meteorological agencies provide five-day forecasts that are shared with residents of informal settlements to alert them to coming climate risks. Information is disseminated through schools and in busy public areas to raise awareness of weather conditions and encourage early responses.

Community data collection enables contextspecific adaptation solutions and local ownership of

investments.⁴⁷Where data collection is undertaken jointly with local authorities and used to augment scientific data on climate and development issues,⁴⁸ it can provide new insights and tailor responses to difficult adaptation issues. Collaboration can also help strengthen partnerships between governments and organized communities, creating opportunities to reset institutionalized or adversarial relationships and reduce long-term vulnerability to climate risks (Figure 3).



Figure 3: Benefits of Community-led Data Collection⁴⁹

Collateral benefits include empowered communities, improved socio-economic benefits, inclusive growth, and more. Entry point to engage with communities and to enable cities to partner with them for co-creating solutions.

COMMUNITY-LED DATA COLLECTION

It can provide qualitative data on social capital, community needs, informal leadership, social networks, etc. It can provide Geospatial data on informal settlement boundaries, basic services, health centers, markets, etc.

It can provide quantitative data on population, employment, number of households disaggregated data on age, gender, etc.

Opportunity to improve digital skills of communities and to influence policies, programs & projects through disaggregated data

Data provides a basis for people to make informed decisions about their responses to climate risks. The lack of disaggregated and simplified technical information on climate risks is a barrier to more effective individual and collective responses to risk in informal settlements. A lack of knowledge beyond experience of climate conditions and an understanding of technical language are barriers to adaptive behaviors and investments. As shown above, in Box 3, progress is being made in simplifying weather forecasts to help people better understand risks and avoid the worst impacts of climate events. While forecast data can be simplified, translating this into longer-term risk-reducing actions and behaviors remains a challenge. However, working with and through CBOs provides a way to educate residents about risks and enables better responses to changing climate conditions.
Spotlight 1: Dar es Salaam

Community-led Data Collection

Understanding the experiences and impacts of climate change and how residents of informal settlements in Dar es Salaam, Tanzania cope with climate risks.



A lack of detailed and accurate information on how changing climate conditions affect informal urban settlements is a major barrier to effective climate adaptation. As part of the World Bank's wider study into community-led climate adaptation for this report, community members in two Dar es Salaam informal settlements led in-depth data collection to explore the experiences, impacts, and responses to climate risks of residents. This community-led research has enabled a fuller understanding of the effects of climate conditions and provided a basis for planning and collective action. It also opened potential entry points for collaboration between the two communities and city government to reduce future vulnerability to climate risks and strengthen adaptive capacity.

Community members conducted participatory research between May and July 2024 in Kombo, located in the Vingunguti ward of Dar es Salaam City Council, and Pakacha, part of the Tandale ward of Kinondoni Municipality (Figure 4).

The Kombo Settlement, with an estimated population of 19,358 people, is located near the Msimbazi River, an area that regularly floods. It is characterized by congested housing, with densities of up to 40 houses per hectare, and limited infrastructure. The settlement has seen little significant public investment. Kombo has a relatively stable population, with over three-quarters (76.5 percent) having lived there for five years or more. The Pakacha Settlement has an estimated population of 5,869 people, and the area has historically experienced severe flooding from the tributaries running through it. The settlement, as part of a wider set of improvements across Kinondoni municipality, has benefited from major investment from the Dar es Salaam DMDP. Major capital works have sought to significantly reduce flood risk with the construction of river embankments, drainage channels, and roads, alongside improvements to footpaths and street lighting. Like Kombo, the population of Pakacha is relatively stable, with two-thirds (65.3 percent) having lived in the settlement for five years or more.





Data collection involved a participatory method to explore the experience and effects of climate change. This community-led approach recognized the unique knowledge and experience of people living in informal settlements and built capacity for local leadership and action to address growing climate risks. In this research, the data collectors asked residents to consider their experiences of rainfall and flooding, rising heat levels, and the effects of wind and storms on their settlements. To examine these issues, data collectors focused on three broad questions to guide the design and delivery of the research.

- How is climate change impacting the lives of residents of informal urban communities in Pakacha and Kombo?
- How are residents of these settlements responding to changing climate conditions?
- Which adaptations could be used to reduce the impact of climate change on low-income communities?



Two CBOs jointly led and delivered the research, the Center for Community Initiatives, a Tanzanian NGO working on urban development issues, and the Tanzania Federation for the Urban Poor, a grassroots group organizing residents of informal settlements. The research was delivered as a sequential process, with the two CBOs leading the research design, ensuring a focus on priority climate issues and engaging and training residents to undertake data collection (Figure 5, Table 2).

Figure 5: Community-led Data Collection Structure, Dar es Salaam



Table 2: Dar es Salaam Research Process and Findings

| Initiation and Planning | Design | Implementation | Outcomes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NGO partner (CCI) appointed to lead delivery of project. TUPF leaders and local government engaged to discuss the research. Workshop held to define research goals and methods. Agree delivery process and timetable. | Identify and recruit 12 community researchers. Training workshop held over three days. Question frame and language tested with community researchers. Pilot and finalize questionnaire. Fieldwork planned and teams set up to collect survey data. | Collect survey data over five days using web-linked hand-held devices Data uploaded daily and checked by CCI. Nine focus group meetings facilitated by CCI. Five stakeholder interviews led by CCI. Dataset reviewed prior to analysis. | Initial data analysis of surveys, charts, mapping, and transcripts to produce key findings by CCI. Findings presented and workshopped with TUPF leaders. Recommendations developed by CCI and TUPF. Draft report reviewed by TUPF prior to wider consultation. Report produced. |

3. Community-Led Adaptation to Climate Change

Residents of informal urban settlements are exposed to overlapping climate risks, but they are not passive in responding to challenges. At the household and settlement scale, individuals and organized groups cope with risks and recover from shocks as best they can. In some circumstances, activity is led by communities to improve housing and environments and adapt to changing climate conditions, such as by creating barriers to block the path of floodwaters or using rocks to weigh down roofs. In others, partnerships have been formed between grassroots groups, NGOs, donors, and governments to develop integrated actions that tie into major development and adaptation investments in city infrastructure. In all cases, community-driven responses are critical to building climate resilience in the most vulnerable areas, especially in the face of increasing climate variability. This chapter examines some of the approaches being taken globally by residents of informal settlements to address climate risk through community-led action. These examples demonstrate the capacity and ingenuity of communities working in partnerships and how these are connected to global dialogue on local-level climate actions.

Community-led climate action can complement national and sub-national climate plans by unlocking local knowledge and resources needed for sustainable change.

3.1 Framing Community-led Climate Action

The scale and complexity of fast-growing cities and impacts of climate change on vulnerable urban communities make bottom-up and inclusive approaches to climate adaptation a necessity. As explored in Chapter 2, informal settlements face increasing risks over the next three decades from rising sea levels, increased rainfall, extreme heat, and more erratic storm conditions. Focusing on action at a local level in informal settlements, directly addressing those areas most at risk from climate change is a vital and urgent task for governments and donors.

Building experience and the capacity for communityled climate action is essential to transform the delivery of urban development and climate adaptation. With informal settlements forming the bulk of residential development across the Global South, governments must see communities as equal partners in addressing climate challenges. There is a need to upgrade, integrate, and adapt environments and housing and extend the provision of services to include informal settlements as part of the 'formal' city. With population growth intensifying pressure on already at-risk areas, urban resilience can only be achieved through partnerships that champion communitybased leadership and create the necessary institutional and finance frameworks.

Community-led climate action can complement national and sub-national climate plans by unlocking local knowledge and resources needed for sustainable change. A key to meeting the vast cost of wide-ranging urban adaptation is diversifying the sources of funding and action that contribute to more sustainable and resilient cities. National climate strategies and infrastructure investment can be enhanced where communities are able to use their local knowledge of risk and link household and collective action into wider programs of settlement upgrading and adaptation. Drawing on community capacity opens huge potential for additional decentralized action that is currently excluded by top-down 'business-as-usual' approaches to urban development.



Enabling community-led climate adaptation at scale in informal settlements will require changes to the systems of government decision making and investment.



Households and communities in informal settlements spend a significant proportion of their income and savings on coping with climate conditions. Recent research in five African cities shows that residents of informal settlements spend between 15 percent and 30 percent of their monthly income on housing repairs and improvements.⁵⁰ As also found in Dar es Salaam (Spotlight 3 below), families use earnings and savings to fund construction and housing adaptation measures, but choices are difficult when there are competing priorities to meet basic needs, and most households can only afford short-term coping measures. These measures include creating barriers to block the path of water during floods and raising foundation levels in areas with high water tables, securing roofs using tires or blocks of stone to reduce damage from high winds, and behavioral changes that include wearing lighter clothing and changing sleeping arrangements to cope with heatwaves.

Household investment could be spent better if focused on reducing longer-term risks. Tenure insecurity, a lack of investment in improvements by housing landlords, low and unstable incomes, and a lack of knowledge on adaptation techniques are barriers for households to move beyond reacting to climate events. While repairing and restoring homes and possessions after weather damage is important in the short-term, these investments do little to reduce longer-term recurring climate risks. Household adaptations, where disconnected from public infrastructure improvement programs, have limited prospects of lessening the burden of recovery for residents of informal settlements.

Beyond individual coping strategies, communities organize to recover from climate disasters and upgrade settlements, contributing to climate adaptation. While climate adaptation has not typically been an explicit driver of community-led settlement upgrading,⁵¹ there is a growing awareness of how incremental in situ improvements can contribute to climate resilience.⁵² Using durable construction materials to formalize dwellings; reorganizing settlements to accommodate service infrastructure, such as sanitation networks, water supply, and electricity; and installing paved walkways and drainage systems are risk-reducing measures.⁵³ There is a clear overlap between creating safe, inclusive, and livable cities, often the focus of national and local government visions of city development and donor policy for urban development programs, with adapting to changing climate conditions. Importantly, community-led settlement upgrading brings to the fore key socio-economic issues,⁵⁴ which are vital to addressing underlying factors such as poverty and tenure that limit individual investment in dwellings⁵⁵ and heighten vulnerability to climate change.

Enabling community-led climate adaptation at scale in informal settlements will require changes to the systems of government decision making and investment. Current structures of governance and finance can create rigid frameworks for delivery that are barriers to communityled actions (explored in more detail in Chapter 4). Greater policy focus on risk-based planning, local capacity building, and the direct allocation of climate funds to grassroots initiatives is needed to break these barriers. Governments need to incentivize and support bottomup climate adaptation. Institutional strengthening and capacity building, using international policy and financial mechanisms, including flexible instruments such as RBF, is needed to create platforms for inclusive adaptation solutions. Both within larger projects and as a stand-alone initiative, RBF is an underutilized instrument that can be employed to support new patterns of working needed to meet urban climate challenges. Leveraging the experiences of community-led action across a range of contexts and improving the leadership of governments and donors to drive decision making and action to the local level are foundations to build partnership approaches.

3.2 Community-led Climate Action in Practice

Community-led actions to improve and adapt urban settlements are particular to social and political

contexts. Community-led action can be positioned along a continuum from collective forms of self-help, undertaken by groups of residents at a settlement level, through to formalized structures for co-production involving organized communities, NGOs, governments, donors, and other stakeholders, such as businesses and universities. With this diversity of form, community-led action is best defined by its characteristics (Box 4) which may change within and between different activities, as groups vary their approaches and negotiate with the many interests and institutions that exist in cities.

Box 4. Characteristics of Community-led Action

Community-led action puts people and their priorities at the forefront of decision making, tailoring activity to meet specific local needs. The geography of 'community-led' is locally defined, ranging from neighbors within a settlement through to city-level federated groups. 'Bottom-up' community-led action shares the characteristics of:

- Local ownership of upgrading and adaptation processes, from conception to completion;
- Open processes of decision making and priority setting;
- Involving all members of the community, ensuring access for marginalized and vulnerable people;
- Encouraging partnerships within the community and with stakeholders including governments and NGOs;
- Retaining economic value and assets within the community, addressing the conditions of poverty; and
- Building capacity within communities through sharing knowledge and skills and engaging with experts and technical partners.

Participatory slum upgrading is an important form of community-led action, with local leadership at the core.⁵⁶

Local networks, such as neighborhood savings groups, mobilize community members to collect data and define, plan, and deliver small-scale improvements to housing and service infrastructure and to undertake locally determined initiatives, such as waste clearances. Frequently initiated by women-led savings networks, community-led upgrading often involves local NGOs providing technical or administrative support to residents' groups. Relationships with NGOs are important for grassroots networks to engage municipal government as a partner and access funding from donors or philanthropic groups. Connecting stakeholders is essential for guaranteeing that adaptation plans are wellresourced and legally recognized. The relationship between community-based groups and city governments can be vital to integrate community-led settlement upgrading with city-level infrastructure investment to gain policy support and regulatory approval (e.g., within planning laws) and to potentially influence institutional responses to informal settlements.57

Leading global networks, such as Slum Dwellers International (SDI) and the Asian Coalition for Housing Rights (ACHR), provide a vital source of support to grassroots organizations.⁵⁸ Through national and global federated structures, these networks support information sharing, lobbying activity, and access to finance through programs such as SDI's Urban Poor Funds ⁵⁹ to enable local groups to scale settlement upgrading initiatives (Box 5). These networks preserve the essential community character of participatory upgrading, while elevating engagement to influence national and international policy debate.

Box 5: Community-led Settlement Upgrading

Asian Coalition for Community Action

Launched by the ACHR in 2008, ACCA is a model of dispersed and community-led settlement improvement, provid-ing small grants to organized communities matched by local savings, to undertake housing and environmental adaptations. With grants kept intentionally small, ACCA encouraged mobilization of community members' own resources to deliver key improvements. ACCA investment has included: road building, sewers and drainage, commu-nity toilets, electricity supply, and housing upgrading. The community-led activity has been used to encourage local governments to invest in connecting infrastructure and to address tenure security issues, thereby extending and scaling impact. ACCA was deployed in close to 1,000 settlements in 165 cities in 19 Asian countries and strategically enhanced the capacity of communities to lead development and climate adaptation works.

UN-Habitat PSUP Jamestown (Ga-Mashie) Low-income Settlements in Accra, Ghana

The Participatory Slum Upgrading Program funded paved roads and sidewalks, creating public space ion markets and streets, improving public toilets and shower houses, and installing a drainage system connected to public waste disposal, within a city-wide program. These developments, completed before the pandemic, have had an important impact on the community, both in reducing flooding and improving sanitation. The improvements to WASH made a major difference during COVID-19. The program has also enhanced the capacity of community members to lead future settlement improvement schemes.

Zimbabwe—Community-led Planning for Settlement Upgrading

The Zimbabwe Homeless People's Federation and its NGO partner Dialogue on Shelter Trust used a community-led approach to plan a settlement upgrading program in Epworth, Harare. They conducted a census to produce a profile of the community and fill gaps in official data and generated maps using GIS software to plan in-situ upgrading and infrastructure. The process enabled residents to articulate their priorities and, with the support of government, agree plans for improvement of the settlement.

While participatory slum upgrading is founded in selfhelp and collective community action, residents of informal settlements lack the resources to address major infrastructure needs without the engagement of government and donor bodies. ⁶⁰ Collaborative and co-productive approaches to settlement upgrading enhance the deliverability of urban development for both government and communities, particularly where plans are embedded in city-wide infrastructure and climate strategies. For example, Cities Alliance ⁶¹ highlights how the SDI affiliate in Namibia and local government in four cities, jointly undertook local data collection, settlement upgrading, securing land titles, and improving basic services. As a co-production initiative, city authorities financed the extension of service coverage of sewage collection and water provision, while community members were responsible for construction works. Also, in Zimbabwe, ⁶² local enumerations and profiling provided a basis for discussions on settlement upgrading with the city government (Box 5 above). Leading global networks, such as Slum Dwellers International (SDI) and the Asian Coalition for Housing Rights (ACHR), provide a vital source of support to grassroots organizations.

Community participation can be included at all stages of a settlement upgrading process. When space is made and support provided for community engagement, established activities and tools can be deployed to support local involvement in program delivery (Table 3). A key factor is maintaining consistency of involvement, with communities included as stakeholders throughout the process, rather than as consultees with little ownership of settlement improvements.

Table 3: Community Participation Across the Settlement Upgrading Process 63

| Stage | Activities | Tools | Examples |
|------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Initiation | Outreach Community organization Capacity building and training | Social marketing Participatory diagnostic survey Stakeholder mapping Training module | Settlement Executive Committees formed as part of the Kenya Upgrading Project KISIP (Box 9) |
| Planning | Community mapping Design workshop Focus group discussions | Maps and diagrams 3D model Games/role play Virtual platform | UN Habitat Participatory Slum Upgrading Program (Box 5) |
| Design | Community meetings | Maps and diagrams 3D model Virtual platform | Viet Nam use of Community Upgrading Plans (Box 10) |
| Implementation | Community contracting Monitoring and evaluation | Construction handbook Community savings Management Information Systems Community mapping Focus group discussion Citizen report cards | Jamaica Integrated Development Project (Box 12) |
| Operation and Maintenance | Self-help maintenanceCost recovery | Service charges (tariffs) Maintenance guide Schedule board Platform for complaints and feedback | Indonesia National Slum Upgrading Project (Box 9) |



Community-led data collection adds value to standard World Bank engagement and context analysis by drilling down spatially into targeted settlements and exploring perceptions, experiences, and local responses to adverse environmental, economic, or climate conditions. It is scalable, flexible, and can adapt to changing conditions, for example, during the COVID-19 pandemic. The use of community-led data collection can complement official and technical data to build a fuller picture of local conditions and provide in-depth information that not only fill gaps but also provides new insights into the perceptions and behaviors of target communities. It provides nuanced insights to target delivery at the most vulnerable communities. Geo-spatial analysis shows variation in need that can be used to focus investment. Linking social, economic, and environmental data highlights structural issues of exclusion by such categories as gender, age, and ethnicity. Mapping coping strategies may identify effective and scalable local solutions to development or climate challenges.



Participatory slum upgrading can form part of the

structure of program delivery. UN-Habitat's PSUP, for example, works primarily with national and city governments, but allocates about 10 percent of its budget to a community-managed fund. Residents control and administer the fund, working closely with the city or national program lead and UN Habitat country office. The ringfenced element of the budget program requires governments to create space for community leadership and aims to have lasting effects on joint working and institutional relationships. As illustrated in Box 5 above, PSUP has had an important impact on the quality of the physical environment and strengthened organized communities to be active agents in the adaptation and upgrading of their neighborhoods.

Similar to participatory slum upgrading, Community-based Adaptation (CBA) focuses on the specific role and capacity of people to use their local knowledge, strength of collective organizing, and resources to initiate adaptation actions within their own settlements. ⁶⁴ Based on a social justice model of urban development, ⁶⁵ CBA responds to a governance and finance system that marginalizes low-income communities. At a local level, CBA provides a space to challenge and/or work with institutions to secure improvements to informal settlements, which are not being delivered through mainstream policy and programming. ⁶⁶ CBA is often facilitated by NGOs working in partnership with grassroots groups or integrated into government programs to support communities to define, plan for, and determine the goals and methods of adaptation. ⁶⁷

CBA emphasizes processes of engagement, mobilization, and empowerment of communities to enable collective resident groups to own change rather than be involved as 'consultees' in decisions driven from outside the settlement. ⁶⁸ An important part of this process is creating the collective and individual efficacy ⁶⁹ needed for people to feel that their viewpoints are listened to and that they can influence change in their settlement. An intended outcome of CBA is to create communities of interest ⁷⁰ to lead the delivery of settlement improvements and climate adaptations. Priorities are determined and agreed locally in response to specific risks identified by communities, alongside the capacity of organized groups to deliver improvements.

Box 6: Mahila Housing Trust (MHT) in India, Bangladesh and Nepal

Women in informal settlements can access training to implement low-cost adaptations to housing energy use and water management to respond to rising heat and drought conditions. Operating through networks at neighborhood levels, MHT has trained over 1,500 women as 'climate-saathis', who are responsible for communicating the issue of climate change with their community in their local language. The initiative puts women in the lead role, promoting small-scale climate adaptations affordable and relevant to low-income communities.

Community-level networks are a vital part of CBA, using social structures to share information, co-ordinate activity, and track changes in settlements. These networks, maintained through neighborhood meetings or savings groups, provide architecture to enable community-based action. Networks provide a structure to support training and information sharing and to coordinate local-level adaptation (as illustrated in Box 6). They empower individuals to create capacity at a grassroots level to initiate and carry out improvements to their homes and settlements. Forms of CBA have been used to deliver ecosystembased adaptations in urban and peri-urban areas at risk of flooding from rivers and sea-level rises. The restoration of natural environments, such as forests, wetlands, and coral reefs, can buffer extreme weather events, rising temperatures, and other environmental stressors. With high proportions of informal settlements located in flood plains, ⁷¹ riverbanks, steep hillsides, and low-lying coastal areas, ⁷² community-based actions can reduce climate risks and generate wider sets of community and livelihood co-benefits. ⁷³ Examples such as land for pocket agriculture (Box 7) ⁷⁴ help protect long-term water supply and sustain the biodiversity needed for food, timber, and water. ⁷⁵ Integrating community-led nature-based solutions (green) with urban infrastructure can be more cost-effective and less disruptive than adaptations reliant on engineered structures (grey) alone. Studies show how complementary use of 'green and grey' creates significant added value in the sustainability and effectiveness of investment.⁷⁶

Box 7: Small-scale Urban Agriculture

With the support of the Metropolitan District of Quito, Ecuador female-headed households have established urban gardens to supplement livelihoods and food security and encourage planting of durable vegetation in settlements. As well as adaptation and mitigation benefits, the project promotes sustainable land management practices, reducing the degradation of environments in informal settlements.

Box 8. Boosting Community-led Action

Kenya – Devolved Governance

Kenya's County Climate Change Fund is making progress to mainstream locally defined adaptations, contributing to sub-regional and national climate NDC priorities. The structure has attracted other funding, such as the World Bank Financing Locally led Climate Action. This is the first World Bank national-level model of devolved climate finance to support the government of Kenya to translate its ambitious climate agenda into scaled-up action on the ground and expand the model nationwide.

Argentina – Urban Labs

In Buenos Aires, communities are incorporating nature into the redesign of the Villa 20 informal settlement, to address growing problems of rising temperatures and flooding. Through the structure of an Urban Lab, partners from local government, NGOs and universities engage in community discussion and consensus building to develop bespoke actions to build a more climate-resilient settlement.

Results-based Financing – Incentives for Change

Where governments lack the funding or motivation to address knowledge gaps, collaborate across silos or implement innovative climate adaptation solutions at a local level, the World Bank Results-based Financing program provides a mechanism to incentivize change. RBF offers a flexible framework to set targets and test new approaches that engage with communities and overcome institutional barriers to collaboration. Focusing on outcomes provides space to transform delivery processes and develop context-specific and cost-effective adaptation solutions.

3.3 Boosting Community-led Climate Action

Realizing the full potential of community-led climate adaptation requires changes in the governance and finance systems that shape decision making on climate finance and development. The growing adoption of LLA principles by donor organizations is a positive sign of the devolution of resources and power to the community level. LLA, championed by the Global Commission on Adaptation (GCA) at the climate change conference COP26,77 calls for subsidiarity of authority and investment in the capacity needed at a local level to build leadership on climate issues. Programs such as LDC (least developed countries) Initiative for Effective Adaptation and Resilience (LIFE-AR) call for 'business unusual,' including increasing the amount of climate finance reaching the local level from 10 percent to 70 percent by 2030; fuller integration of adaptation, mitigation, and development goals; and funding and decision making that prioritizes social justice outcomes.

While LLA offers positive signs of change, the translation

of these into practice is more challenging. There are significant institutional barriers to shifting established governance structures and operational arrangements of international finance. ⁷⁸ Changes to decision-making processes can be hampered by a complex set of preconceptions about the relative legitimacy of actions and actors, multiple tiers of accountability for public funding, and the practical aspects of capacity and technical capability to deliver local interventions (discussed further in Chapter 4). 79 Additionally, many governments and donors remain hesitant to allocate major funding directly to community groups without enhanced safeguards and transparent reporting measures. However, existing models and instruments could be scaled to boost community-led action (Box 8), ⁸⁰ and financial mechanisms, such as RBF, can incentivize change, leverage and improve the impacts of donor-funded programs, and create the space to test devolved forms of climate adaptation delivery.

Community-led climate adaptation offers significant potential but needs to be mainstreamed to make a

difference. As shown in this chapter, a myriad of projects and examples of community-led action are making a difference in communities. However, a transition is needed to invest in and scale what works and to incentivize changes to finance systems and governments to support local-level action.

Spotlight 2: Dar es Salaam

Erosion of Msimbazi River Kombo Settlement

Vulnerability to Climate Change

Poverty and locational risk factors overlap to make residents of informal settlements highly vulnerable to adverse climate conditions.



Solid Waste Blocking Drainage, Pakacha



Low and unstable incomes increase the vulnerability of communities to the effects of climate change. About half the residents in the Kombo and Pakacha informal settlements have earnings below the international poverty line of US\$2.15 per day. With the majority reliant on smallscale trade in the informal economy, adverse weather events can easily cause a loss of earnings and goods for sale, putting additional pressure on savings to meet basic needs. The location and poor conditions within settlements are also a major cause of vulnerability. Housing located in high water table areas and close to rivers and drainage channels is exposed to regular flooding, particularly where watercourses are blocked by high volumes of solid waste. About one-third of residents confirmed that they live in flood-prone areas and are at risk from overflowing rivers and water encroachment through the foundations of their homes.

Flood Damaged Dwelling, Pakacha



"Flooding is one of the most [serious] challenges I face. When it rains water enters to my house, things are destroyed. Since my house is in a high-water table area, it always floods whenever it rains."

- Focus Group Discussion, Kombo

Low construction standards and the use of repurposed materials to build homes increase the climate vulnerability of communities. The use of low-grade cement and clay bricks, tin for walls and roofing, and few small windows provide limited resilience to adverse weather conditions. Additionally, the use of poor-quality materials means that homes need frequent repairs, increasing regular costs to recover from weather events and replace assets. In Dar es Salaam, residents said that the costs of recovering from flooding can total between one- and two-months' earnings, depending on the severity of impact. Climate events that happen in quick succession can significantly increase the vulnerability of households, reducing their ability to recover from the next occurrence.



Figure 6: Main Climate Risk Concerns, Pakacha Settlement

Exposure to climate risks can have a major impact on the health and well-being of residents of informal settlements. Pervasive extreme heat leads to skin conditions for about half the population and causes respiratory problems and urinary infections among about one in 10 people. Hot weather and concerns about flooding and high winds cause a loss of sleep and stress. Health issues have financial impacts, with about half of residents in the settlements seeking medical assistance for climaterelated illnesses. However, only one in 10 people has access to medical insurance—creating additional burdens on families.

"Children have difficulty sleeping and sometimes they get skin rashes, due to extreme heat. Also, adults with blood pressure are much affected by extreme heat."

- Focus Group Discussion, Pakacha.

Vulnerabilities are not evenly distributed across

communities. Climate risks disproportionately affect women, children, and people with disabilities. Hot and humid conditions can give infants skin irritations and chest infections. Children face difficulties attending school when roads are flooded and during periods of extreme heat overcrowded and hot classrooms make learning difficult. Rising water levels cause drainage channels to overflow, flooding homes and contaminating water leading to stomach complaints. People with chronic illness or mobility issues can be isolated in their homes during storms and floods, unable to access their support networks.



4. Finance for Community-Led Climate Adaptation

While there is a growing global interest in expanding the involvement of communities in the design and delivery of major urban programs, this can be problematic when schemes are managed through national governments and investment is focused on large-scale public infrastructure. Established governance and accountability arrangements for public resources are often poorly suited to the inclusion of communities in decision-making and delivery. Nonetheless, communities have a vital role to play as stakeholders and experts in their contexts, working alongside governments and funders to realize the full local benefits of major investments. This chapter first examines the context of adaptation finance and then evidence from the World Bank's Integrated Urban Development Programs to identify how spaces for communityled action can be created within multi-sector schemes. The flow of global climate finance needs to better reflect the scale and complexity of climate change.

4.1 Landscape for Adaptation Finance

There is a significant gap in overall levels of global finance for climate change. While the value of climate finance has been rising since 2018 to an estimated US\$1.55 trillion in 2023, this is just one-fifth of the annual requirement of US\$7.4 trillion per year needed between 2024 and 2030 under a 1.50C global warming scenario.⁸¹

The flow of global climate finance needs to better reflect the scale and complexity of climate change. While overall levels of investment must rise, this will need to be driven strategically at the national and international level through refocusing funding from multi-lateral development banks, expanding concessional finance, and tackling the high debt levels in developing countries. ⁸² It will also require more inclusive effort at city and local levels to mobilize domestic private finance and incentivize household and community investment in reducing climate risk. ⁸³ These systemic changes are essential to ensure that increased finance commitments are effective in tackling key vulnerabilities to climate change.

Little global climate finance finds its way to informal

settlements. ⁸⁴ Detailed analysis by the Cities Alliance of 22 global climate funds operating between 2003 and 2023 shows that just 2.1 percent of all projects and 3.5 percent of approved budgets targeted informal settlements and the urban poor. While funding may find its way through national and local governments to urban poor people, there is clearly a gap in targeting the groups most vulnerable to climate change and in the reporting systems that track allocations of budgets.



There are significant institutional and procedural barriers to the flow of finance to community-based organizations.

Barriers reflect the processes and requirements of governmental organizations, which, rather than intentionally excluding community-level finance, do not actively consider how arrangements might affect participation. Three connected aspects to the management of development finance can be identified, as limits to community-level financing (Figure 7).



Figure 7: Barriers to Financing Community-Level Adaptation Action⁸⁵

Power and perceptions—unequal levels of authority, decision-making cultures, and pre-conceived ideas about what CBOs can and should do, shape the willingness of governments and donors to direct resources to communities.

Risk and accountability—donor requirements for reporting and finance systems and the use of competitive selection processes are barriers to participation by community-based groups and may inhibit innovation.

Grant values and timescales—large funding packages that have limited scope for capacity building, with delivery over timescales that do not allow for full engagement of communities are barriers to inclusive project delivery.

It is important to overcome these embedded barriers to target adaptation finance to the most vulnerable

communities. Adaptation finance needs to be better integrated in frameworks delivering rapid and resilient development and in countries that are most exposed to climate impacts.⁸⁶ As discussed in Chapter 2 above, lowincome and informal urban settlements face the greatest risks from climate change, and a more purposeful approach is needed to explicitly include climate risk reduction in settlement upgrading programs. Flexible funding, such as RBF, should be deployed to address procedural and administrative barriers to community-level financing, build the capacity for institutional change, and design processes that enable community-led action.

Improving information flow on climate risks and including communities in decision making contributes to more effective use of adaptation finance. The adoption of principles for LLA ⁸⁷ and locally-led climate action ⁸⁸ requires greater subsidiarity of decision making and finance flows, supported by corresponding changes in the finance and governance systems that direct resources. While definitions of 'local' can vary significantly across contexts, ⁸⁹ LLA principles help focus on the key barriers and opportunities to tailor investment and action in ways that are contextually specific, relevant, and impactful. In contexts that are inherently uncertain, development and adaptation funding must be patient and transparent and create a positive institutional legacy of inclusion. ⁹⁰ Locally tailored funding has a major role to play when directed to respond to the complex experience of vulnerability to reduce intersectional inequalities that marginalize communities.

Progressive implementation of community-level funding and decision making will accelerate the pace of reform, as decentralized approaches to finance become normalized. Major schemes including the Adaptation Fund⁹¹ provide funding opportunities for local projects. The long-established Global Environment Facility small grants program ⁹² and initiatives such as the Climate Investment Funds Smart Cities Program ⁹³ demonstrate the potential for reshaping adaptation finance. But there remain significant barriers to local allocation of finance, which include donor accreditation and program management requirements, ⁹⁴ the lack of information and focus on sub-national climate risks, and the high proportion of finance routed as market rate debt or concessional lending. ⁹⁵

4.2 Learning from World Bank Integrated Urban Development Programs

The World Bank is investing US \$5 billion annually in sustainable urban development. Working primarily through national and local governments, the World Bank is focusing on enhanced planning, strengthening financial systems, promoting territorial development, building climate resilience, and investing in inclusivity. ⁹⁶ The World Bank climate action plan prioritizes cities and urban systems, with support for governments to implement solutions that help build city resilience to climate change and to decarbonize.

In the context of fast-paced urbanization, cities are a key focus for World Bank activity to help meet demand for affordable housing, viable infrastructure, basic services, and jobs. The World Bank is helping countries cope with demand for land and services in ways that do not further degrade environments or increase climate risks for future generations. Cities will require massive investment and the capacity and skills to build livable, resilient, and inclusive urban communities. The World Bank takes an inclusive approach to improving the physical fabric of cities, incorporating slum upgrading within integrated development programming alongside building the resilience of infrastructure and communities to climate change.

Inclusion is a corporate commitment and central to the World Bank's methodology for investment and partnerships. Undertaking participatory assessments to identify key development needs and to establishing structures for communication, grievance management, and consultation at settlement level. Involving local leaders and networks in decision-making processes is a key component of program delivery arrangements. ⁹⁷ As the primary form of local engagement is consultative, at various stages during planning and implementation, there are opportunities to enhance community-level data gathering to gain greater insights into the socio-economic conditions within settlements. Devolved funding for community-led research and development actions have been used in some circumstances to complement capital works, however, flexible RBF could be used more extensively to include organized communities in the planning and implementation of projects. The following explores how the World Bank has supported and enabled community involvement and leadership in integrated programs.

4.2.1 Community Engagement in Decision Making

World Bank urban programs create structures to communicate with and involve communities. Often temporary and specific to the projects being delivered, these are intended to inform delivery and remove barriers to project implementation. They can also help address under-representation of women and marginalized groups and create a platform to reset relationships between communities and government. They predominantly are consultative and involve the formation of area committees and grievance redress mechanisms, with some examples (Box 8 above) of devolved decision making about local plans.

World Bank urban programs primarily establish new community engagement structures that reflect delivery requirements, rather than use existing networks (Box

9).⁹⁸ While this may have the benefit of aligning the form of community involvement to project goals, with membership drawn to reflect targets for stakeholder engagement, it may also bypass existing networks or CBOs. Working through established groups can enhance credibility with settlement residents and reinforce the efficacy of grassroots structures. Trust building is important for all marginalized communities, particularly in fragile or conflict-affected contexts.

In the context of fast-paced urbanization, cities are a key focus for World Bank activity to help meet demand for affordable housing, viable infrastructure, basic services, and jobs.

Box 9. Types of Community Engagement

Kenya—Community Upgrading Plans

Within the KISIP program, settlement executive committees (SEC) were a prerequisite to ensure that upgrading plans reflected the priorities of communities. SECs had representatives of youth; the business community; women's groups; groups representing disabled people; religious groups; local professionals, for example, teachers; landlords; tenants; and local members of the county Assembly. As local-level structures, SECs were responsible for mobilizing the community, linking residents to program managers and contractors, facilitating enumerations, and producing settlement upgrading plans.

Republic of Congo—Participatory Data Collection

Residents of informal settlements in Brazzaville were trained in open-source mapping to capture local experience of flood, soil erosion, and other natural disasters affecting the targeted settlements. Being able to collect and digitalize local knowledge and perceptions of climate risk improved the targeting of investment and created an information resource for community-led adaptation actions.

Indonesia—Community Participation

The National Slum Upgrading Project supported strengthening community participation in planning, implementation, and monitoring through training community members to prepare sub-project proposals and provide feedback on financial and project management. The activities were aimed at building the role of community organizations and creating the capacity for groups to undertake the operation and maintenance of community infrastructure, working with local governments. Training and capacity building enabled communities to monitor the performance of improved infrastructure and to undertake small works, under the supervision of local government.



The World Bank works with local committees and consultative groups to undertake or support the collection of local data. The involvement of community leaders is vitally important to gain access to hard-toreach residents. Working with leaders builds trust and gives confidence to residents of informal settlements to share information. When data collection is undertaken with local groups, the analysis can be used beyond the immediate program to inform community-led action and improve evidence on unmet needs. The experience of data collection also builds community awareness of issues and the capacity to undertake similar tasks in the future.

Community participation in decision making enhances a sense of local ownership of improvements. Making space for residents of informal settlements to influence the design and delivery of programs helps ensure that investments are effective and sustainable. When communities can take ownership of new facilities and infrastructure (e.g., through maintenance contracts or transfer of assets) they are more likely to use them and contribute to the ongoing operation. Lessons from World Bank programs in Indonesia and Viet Nam show that early engagement of communities and dividing upgrading contracts into smaller units that can be let to MSMEs, delivers outcomes that are better aligned to need than large-scale 'top-down' contracting.

4.2.2 Enabling Community-led Actions

In addition to major capital expenditure on infrastructure, climate-adaptation programs can create a positive environment for ongoing household, private sector, and social enterprise investment in informal settlements. A key outcome of risk-reducing infrastructure is an improved environment for investment in housing and businesses (Box 10). ⁹⁹ Areas suffering from flooding and poor access to electricity are unlikely to attract private finance. Reducing risks in settlements through new infrastructure can incentivize homeowners to improve dwellings, making them more resilient to changing climate conditions, and giving confidence to businesses to create new enterprise.

Similarly, clarification of land titles and improving tenure security in informal settlements can provide a major boost to household investment. In Kenya,¹⁰⁰ transferring land titles to residents of informal settlements reduced instability and risk of eviction and enabled households to leverage assets to further improve their living conditions. Improved tenure security is a positive incentive for households to make longer-term investments and adaptations that reduce risks from climate events.

Devolved funding for complementary environmental and economic development activity encourages innovation and builds capacity for community leadership. Lessons from World Bank programs in Viet Nam ¹⁰¹ show how small grant budgets allocated to CBOs led to successful initiatives such as tree planting, waste collection, and a reduction in the use of plastics. Small grant budgets for community-led actions enabled settlement-level adaptations that raised awareness of climate issues and protected environments and public spaces. Bank programs in Jamaica ¹⁰² used community-based contracting to provide grants for smallscale neighborhood improvements and procured local suppliers to deliver small-works contracts to economically benefit the community. The parceling of works into smaller lots may increase contract administration, but local procurement generates wider social and economic benefits.

Box 10. Examples of Community-led Action

Viet Nam—Household Investment in Climate Adaptation

The World Bank's Mekong Delta Region Urban Upgrading Project sought to induce household investment through voluntary financial and land contributions to improvements and, indirectly, own-account investment in housing. While seeking voluntary contributions had limited success over the life of the program, the settlement improvements coincided with occupier investment in properties. An end-of-project survey shows that more than four in 10 households surveyed (41.9 percent) had upgraded their houses, and that the proportion of homes built with temporary materials had decreased from 29.2 percent to 4.9 percent.

Djibouti—Community Development Funds

By setting up a community development fund as part of a wider program of infrastructure investment, partners were able to support the delivery of local initiatives that achieved skills and employment outcomes for young people. Focusing on environmental improvements and adaptations, communities could access grant funding to improve water supplies and sanitation facilities and undertake tree planting, and solid waste collection.

Delivery through community-led groups and social enterprises can also provide cost savings. Indonesia,103 has established strong community capacity for delivery of tertiary infrastructure schemes. This included Community-Driven Development programs that allocated block grants for community infrastructure and revolving funds for income-generating activities. In the World Bank funded National Slum Upgrading Project, community-based delivery enhanced local ownership of improvements and was at least 20 percent less expensive than local government contractors, without any reduction in quality on technically simple works. Social enterprises had a key service delivery role throughout the COVID-19 pandemic, demonstrating the added value of community-based and socially oriented businesses to reach informal settlements. Evidence suggests that social enterprises as service deliverers can be highly effective and achieve lower costs by working at a local level. 104

4.2.3 Applying RBF to Community-led Adaptation

While significant improvements can be achieved in cities through major capital investment in infrastructure and adaptation, ensuring that the poorest households benefit remains a key challenge. The World Bank has worked to address this issue by using financial incentives that remove structural and cost barriers to basic service provision (including water, sanitation and energy) and encourage change in the behaviors of governments and communities. The World Bank has developed an in-depth understanding of how to incentivize change in markets and institutions through deploying RBF (Box 11). While RBF has not yet been used for multi-sector urban development, Bank experience in health and education sectors provides some lessons for how to shift toward community-led adaptation.

Box 11: Definition of Results-based Finance

RBF includes a range of financing mechanisms in which funds are linked to, and provided after, the delivery of pre-agreed and verified results. Instruments range from results-based aid for the delivery of strategic development targets by national governments to performance-based contracts to improve the outputs and effectiveness of service providers and impact bonds, in which an investor gets paid when agreed results are achieved. RBF has been used to strengthen institutional capacity, scale evidence-based programs, catalyze the adoption of promising programs, and encourage outcomesoriented interventions. When applied to the specific contexts of urban informal settlements, RBF can support community-led adaptation but is not suitable in all contexts.

RBF is a flexible financing instrument that can be shaped to target specific delivery barriers or vulnerable communities, keeping a clear focus on local solutions and outcomes.¹⁰⁵ This makes RBF suitable for use in complex urban environments, where there is a need to support the development and testing of bespoke delivery models. The focus on outcomes gives local partners and providers the space to respond to the context, rather than follow prescribed delivery pathways. RBF has been used by the World Bank to target underserved or hard-toreach communities in large-scale health and education programs¹⁰⁶ and to address specific sectoral issues as part of wider urban development programs (Box 12). RBF is most effective when complementing other finance instruments. It can be used tactically to build capacity and to incentivize targeting at-risk populations, such as refugees or internally displaced persons in cities.¹⁰⁷

When applied to the specific contexts of urban informal settlements, RBF can support community-led adaptation but is not suitable in all contexts. RBF can help shift expectations and behaviors to support the delivery of community-led adaptation actions, but arrangements need to build capacity to deliver (in both communities and local government), and funding needs to be tailored to reflect the financial position of community-based groups (Table 4). Output and performance targets need to be carefully framed to maintain a clear incentive and not become obstacles to positive outcomes in fragile contexts.

| Benefits of Results-based Approaches | Barriers to Results-Based Approaches | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--|
| Focus on outcomes —enhances accountability of government and service providers to communities. | Requirement for upfront funding — may deter community-led organizations. | |
| Emphasis on blended funding —creates space for inclusion of private sector and community funds (e.g., investment by utility companies and the use of community collective savings). | Need for supportive institutions —RBF may be difficult to implement where settlements lack official recognition. | |
| Closing market and service gaps —removes cost barriers to service provision extended into low-income areas. | RBF can be complex to set up —particularly where there is contested land ownership or where performance targets are hard to achieve. | |
| Verification system —strengthens local-level data collection when combined with community enumerations. | Needs good public administration — capacity to effectively set and manage contracts. | |
| Integrated learning —encourages experimentation and use of local knowledge to design bespoke local adaptation solutions. | Responsive private sector — requires existing market capacity among MSME as providers and specialist contractors. | |

Table 4: Benefits and Barriers—Results-based Approaches for Community-led Adaptation

RBF has been used for institutional strengthening to

improve investment conditions. Communities can be discouraged from investing in their homes because of tenure insecurity and a lack of access to private capital. A World Bank project in the West Bank¹⁰⁸ accelerated the transfer of property rights, with activity focused on supporting and incentivizing government capacity to improve land administration. The project addressed both a fundamental issue of housing insecurity and weaknesses in public capacity to create the foundational conditions for investment. Improved land tenure, as was also found in Kenya, removed barriers to enable households and communities to leverage their assets to adapt to changing climate conditions or make productive investment in property to address climate risks.

Incentives can also be used to encourage communities to behave differently to realize the value of infrastructure

improvements. This is evident in improved drainage systems and solid waste management. Cities face challenges in maintaining the effectiveness of water management infrastructure, where there is often largescale dumping of solid waste. Any consequential flooding from blocked drains is likely to be most severe in informal settlements. RBF has been used to incentivize and reward changes in behaviors that support the efficacy of improved infrastructure. Local ownership and leadership are important in these contexts, as communities are not only the intended beneficiaries of improvements but also need to be positioned as long-term custodians.

Improvements in urban infrastructure, such as sanitation and energy systems, may be inaccessible to low-income

households. Even where trunk infrastructure (e.g., water, sanitation and energy) is improved, covering the 'last yard' to connect low-income households may require targeted interventions that secure rights of access or subsidize connection costs. RBF has been used to address market failure, for example in Ghana, where the benefits of sanitation infrastructure improvements had not been shared in low-income areas (Box 12).¹⁰⁹ While this scheme had some success, a World Bank review of the implementation found that subsidies alone were inadequate to motivate households in low-income areas to seek improved sanitation. Financial incentives need to be accompanied by outreach and activity to adjust behaviors that encourage households to take up service provision. This type of community engagement is most effectively delivered locally by local leaders and community-based groups that have the knowledge and credibility to connect with residents.

Box 12: Incentives for Community-led Action

Jamaica—Improving Solid Waste Collection

As part of major investment in waste management facilities and services, the World Bank engaged CBOs to support behavior changes in informal settlements focusing on increasing recycling and reduced littering in neighborhoods. Alongside investment in collection facilities and recruitment of local wardens to encourage behavior changes, community groups received financial bonuses when they met qualitative cleanliness targets. This approach was effective in changing perceptions and behaviors and reduced waste in the target settlements.

Ghana—Extending Sanitation Networks

The World Bank used RBF to reduce the costs of connecting households to trunk sanitation networks and incentivize service providers to extend their operations to low-income areas. Subsidies were provided to make the sanitation facilities affordable, and communication campaigns were used to educate and create a demand for households to connect to sanitation systems. The project faced several challenges to creating demand, due to a lack of grounded evidence on the hidden costs of microfinance schemes and on the capacity of micro and small enterprises expected to undertake contracting works.

The flexibility of RBF can also create the conditions for blending of finance to support local-level adaptation

actions. For example, conditional payments were used in the World Bank project to incentivize the provision of water and sanitation in low-income areas in Kenya. ¹¹⁰ Subsidies were only available to water service providers where they accessed commercial funding to extend service provision to underserved areas. This approach helped leverage public funding, create a framework to attract private-sector investment, and, importantly, allowed a financial model for services to be priced at a level affordable to people on low and insecure incomes.

Spotlight 3: Dar es Salaam

Adaptive Capacity and Climate Change

The ability of households to strengthen resilience to avoid future risks from climate change is vital to reducing vulnerability.

Housing in Pakacha Settlement



Communities are not passive in coping with climate

change. Individual households and collective groups of residents deal with adverse weather conditions the best they can in contexts of low and insecure incomes. However, evidence from Dar es Salaam indicates that individuals have little knowledge or capacity to adapt and are locked into short-term recovery until the next event. This pattern of behavior has diminishing returns as climate conditions worsen, with each crisis reducing the financial stability and ability of households to recover.

Investments in adaptations to housing and the environment inevitably compete with meeting everyday

needs. A lack of technical knowledge on methods of adaptation and limited access to banking services mean that people make decisions based on immediate affordability, rather than on measures to reduce risks over the medium- or long-term. With limited improved infrastructure in informal settlements and public policy prioritizing disaster risk reduction over settlement upgrading, coping is the primary option open to residents of Pakacha and Kombo, which may include temporary relocation for some (Figure 9).

Adaptations vary according to climate risk, with actions to reduce flooding being the most substantial and costly.

The construction of barriers to prevent floodwater from entering housing, alongside raising foundations or door levels, can reduce risks. Structural modifications contrast with lower-cost adaptations to high winds, which are limited to nailing or weighing down tin roofing to reduce impact from storm conditions. People in informal settlements typically cope with extreme heat by changing behaviors, such as using fans, staying in the shade where possible, and drinking extra water.

The cost of adaptations and coping measures vary, from additional construction works to reduce flooding being the most expensive to lower additional energy costs

for the use of fans. However, coping and recovering from climate events is a constant pressure as residents manage overlapping weather conditions. In the two settlements, households indicate that they can spend up to one third of their earnings on repairs, maintenance, and property replacements, related to climate conditions.

There is limited preparation for adverse weather

conditions. This is confirmed by data on when people take action on climate risks. As shown in Figure 8, people act early primarily to manage rainfall and the risks of floods, with the majority of action for heat taken during heatwaves and during and after high winds.

In extreme cases, residents temporarily move out of their homes until the climate risk has passed. But because of the high costs and disruption of relocation, just one in five people across the two settlements take this option. Decisions to relocate depend on the severity of the risk. As can be seen on the map (figure 9), people at high risk of flooding near the Msimbazi River are much more likely to take this option than people in less affected parts of the settlement.

Figure 8: Responding to Climate Events



Figure 9: Temporary Relocation Due to Climate Risks, Kombo



Collective and community-based action to reduce climate risks are also evident in Pakacha and Kombo. Communities take collective action to plant trees, clear drainage channels, and reduce the erosion of land during floods. However, limited capacity and information on adaptation constrain the effectiveness of these actions. Communities in the two settlements look to partnerships with the local government to deliver upgrading and adaptation measures to reduce climate risks.

There is community interest in working with the city government to support the extension and operation of drainage systems to reduce flooding, building on the recent investment in Pakacha through the Dar es Salaam Metropolitan Development Project. The community is also interested in planting trees and creating more green spaces to help manage heat and increase the absorptive capacity of land. City government has a key role to play in incorporating upgrading action in planning policy. The community also needs more information on how to manage climate risks and to adapt housing and environments. "The government should help us to plant trees [...] and encourage at least every individual to plant a single tree to reduce extreme heat."

- Focus group discussion, Kombo.

Adaptation to Reduce Erosion, Pakacha



5. Putting Community-Led Adaptation into Practice

There are clear advantages to community-led climate adaptation in informal settlements, but implementation can be challenging. Established methods of project design and delivery by public- and private-sector organizations often leave little space for communities to play a meaningful role. The inherent limitations of scale and capacity in community-led activity restrict potential impact, particularly when adaptation requires major investment in infrastructure, environments or housing. However, bringing together the different skillsets and capacities of governments and communities increases the effectiveness of adaptation actions. Facilitating community leadership by devolving decision-making and using RBF to build incentives and capacity for local delivery can improve targeting of the most vulnerable places and people, inform the design of bespoke solutions for local problems, and have a lasting impact on the resilience of settlements. This chapter focuses on putting community-led adaptation into practice, building on the examples presented earlier in this report.

Community involvement, data collection, and local leadership in informal settlements can fill gaps in information and create capacity for action.

5.1 Understanding the Context

A detailed understanding of the environmental and socio-economic conditions of informal settlements is vital to designing effective adaptation measures. Citylevel context analysis of climate risks may overlook how informal settlements work and the trade-offs that people in poverty make to cope with everyday conditions. A nuanced understanding of how individuals respond to risks can help improve the effectiveness of investment. As illustrated in the Spotlight sections, households in poverty focus on coping and recovery, which can undermine their longerterm adaptive capacity. In the Dar es Salaam settlements, a lack of affordable solid waste collection leads to dumping of waste, which blocks the flow of drainage channels and increases the risk of flooding. The Spotlight case studies underline that understanding the intersection of climate risk (rainfall), socio-economic conditions (poverty), and the lack of service provision (solid waste management) is vital to designing effective urban adaptation measures.

Community involvement, data collection, and local leadership in informal settlements can fill gaps in information and create capacity for action. When designed into project and management arrangements, communityled action can use participatory methods to engage residents of informal settlements and reach individuals typically under-represented in data because of language or literacy barriers.¹¹¹ Such approaches can fill information gaps and mobilize communities, ¹¹² bringing individuals together through research tasks to reinforce the social bonds needed for collective action. Gathering and analyzing data is a reflective task that can help strengthen agency ¹¹³ and efficacy ¹¹⁴ among community members to act and hold public agencies accountable for settlement improvements. Creating and sustaining these links are vital to enabling community-led adaptation.



Box 13. Viet Nam—Tailoring Infrastructure Delivery to Reflect Local Needs

The World Bank Mekong Delta Region Urban Upgrading Project tailored construction schemes to address localized flooding risks in low-lying deltas and connect with household-led improvements. Local knowledge, captured in Community Upgrading Plans and flood modeling, was used to vary specifications of works to allow follow-on improvements by households. These included lowering the elevation of drainage/sewage pipes, adjusting designs of sewage systems along alleys to connect residents' septic tanks, and creating temporary water retention areas in gardens. Designing-in these features made it more likely that private investment would follow and extend the benefits of public works. Integrating local knowledge of contexts into project design can help connect infrastructure and household investment in ways that directly deliver adaptive and quality-of-life improvements. Understanding the specific conditions and needs of informal settlements creates opportunities to tailor delivery to enable households and collective groups of residents to maximize the benefits of city-level investment. Varying design specifications can both address specific local risks and incentivize complementary investment in housing and environmental improvements (Box 13). When scaled, connecting trunk infrastructure to settlement-level improvements, led by organized communities, can multiply the value and wider benefits of public investment. Similarly, off-grid local solutions, such as involving social enterprises to deliver 'last-yard' services, where communities and the private sector work in partnership with utilities (or government entities) on design, implementation, and operations and maintenance can also provide contextually relevant adaptation.

Table 5: Using RBF to Understand the Context

| Objective | Results-Based Finance | |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Understand the context and interdependences of climate, socio-economic, and institutional factors. | Grant funding for community-led data collection, targeting and engaging the most vulnerable groups. | |
| Build capacity of grassroots networks to co-ordinate community engagement and lead adaptation delivery. | Performance-based funding to develop the capacity and technical skills of local stakeholders, including local governments and grassroots and NGO groups. | |
| Shift the use of short-term household expenditure on recovery into investments that increase resilience to climate conditions. | Incentivizing household investment in housing improvements or extending and using improved infrastructure. | |



Implementing community-led data collection and engagement requires flexible funding to complement main delivery budgets. RBF can be used to build communitylevel capacity to make the connections between major capital programs and activity at the settlement level. RBF can take the form of grants or performance and incentive payments to support collaborative and exploratory actions to tackle complex issues and maximize the value of investment (Table 5).

5.2 Creating Receptive Institutional Environments

Institutional context is vital for community-led climate

adaptation. Organized communities in informal settlements will primarily engage with local governments on housing and infrastructure upgrading and on climate adaptation issues. This relationship and how it is framed in policy and regulation, will determine the scope for community-led action. Adversarial relationships with local governments may undermine community leadership and the opportunity to scale effective interventions. As communities in informal settlements need to be viewed as part of the solution to urban climate adaptation, improving institutional capacity and relationships are key.

The relationships between local governments and organized communities of informal settlements can be challenging, particularly when there is a history of evictions and site clearance. Ingrained negative perceptions, on both sides, and a lack of experience of working together are disincentives to collaborating on climate adaptation. Even when there is a will to look at more inclusive approaches to urban development, a lack of capacity to engage, politicized institutional processes, and insufficient data on informal settlements are barriers to strengthening relationships.

Community-led adaptation requires strong foundations in policy and practice. Along with the political will and organizational capacity to look beyond 'business-as-usual' operations, governments need supportive institutional frameworks, for example, land-use and planning policies that recognize the existence of informal settlements and permit community-led upgrading of informal settlements. Communities need security of tenure to encourage individual investment in homes and infrastructure.¹¹⁵ Local governments should be willing to engage in dialogue and set up governance structures that include residents of informal settlements. These structures, for example, in Mukuru, located in Nairobi, Kenya, create the basis for inclusive development of informal settlements (Box 14). ¹¹⁶

Institutional arrangements need to be shaped to enable contracting and partnerships between local governments and community-based groups. The contracting and reporting arrangements often used by governments and donors can be ill-suited to the limited capacity and working arrangements of grassroots organizations. High contract values, strict financial management procedures, and lengthy reporting requirements create barriers to engagement and joint working. In addition, a focus on

Box 14. Kenya -- Mukuru Special Planning Area

The Mukuru Special Planning Area (SPA) in Nairobi, Kenya is a well-documented example of communityled settlement upgrading within a supportive institutional framework. Mukuru is one of the largest informal settlements in Nairobi, with an estimated population of over 100,000 people living in a densely packed 689 acres with little access to basic services. The Nairobi City County designated Mukuru a SPA, as a first step to producing a statutory integrated development plan.

The SPA was championed by an alliance of community partners (Muungano wa Wanavijiji, a women-led savings groups based in informal settlements; SDI-Kenya, a technical assistance NGO; and the Akiba Mashinani Trust, a community-led finance facility) with the aim of creating an inclusive planning process. Community groups mobilized residents and involved them in thematic discussions on improvements to infrastructure, housing, services, the environment, climate adaptation, and commerce.

The SPA has provided a structure to resolve longstanding conflicts over occupation of urban land to focus on settlement upgrading and reducing climate risks. Mukuru shows how relationships between governments and organized communities can be transformed to support participatory local actions and create institutional space in government and capacity within communities to deliver adaptation.

outputs rather than outcomes deters innovation and the use of social mechanisms to deliver adaptation and development. Procedures and contract terms can be varied to enable community groups to access and deliver funded project activities, with grassroots organizations playing a key role in providing access to hard-to-reach urban communities (Table 6). Arrangements that favor partnerships over tight contract management have the potential to stimulate more creative and inclusive approaches to problem-solving and achieving key outcomes. Additionally, partnerships are more likely to build the capacity of community groups than short-term contract arrangements.



Table 6: Contract Arrangements to Enable Community Leadership¹¹⁷

| Barriers to Community-level Finance High Low | | | | |
|-------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------|--|--|
| Tightly Controlled Contracts | Flexible Management Arrangements | Partnership Agreements | | |
| Prescribed contract conditions | Core requirements with variable elements related to context | Priorities set, but contract outputs and process open to negotiation | | |
| Preferred suppliers list | Limit bidding opportunities to include community-based lead organizations | Simplified bidding open/accessible to domestic partner organizations | | |
| Fixed deliverables and timescales | Core outputs linked to overall priorities for donors | Headline outcomes, with outputs open to negotiation | | |
| Low risk/low innovation model | Management control systems allow for piloting and learning | Formalize joint partnership manage- ment agreements | | |
| Large value funding calls | Large budgets that can be sub-divided or sub-contracted to smaller CSOs | Variable values to allow smaller groups to engage. | | |
| Fixed measures of success | Core measures of success variable by level | Mix of output and outcome measures to determine return on investment. | | |

Shifting institutional behaviors requires targeted resources and incentives to build capacity and motivate

change. RBF is a particularly useful tool to encourage shifts in institutionalized perceptions and practices, using performance and incentive payments to link funding to changes in policy and procedures. RBF's focus on achievement of outcomes, creates space to tailor delivery arrangements to the local context and, where new arrangements are being trialed, to support or de-risk new practices (Table 7). With the commitment of organized communities in Pakacha and Kombo and the support of local government and donors, there is significant potential to deliver a long-term program of adaptation to reduce climate risks. This recognizes the essential role of community members as full partners in processes of change. The complexity of urban contexts, the scale of need, and the urgency created by climate change make it essential that all actors use their capacity creatively to build inclusive and sustainable cities.

Table 7: Using RBF to Improve the Institutional Environment

| Objective | Results-Based Finance |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Institutional strengthening of local governments, for example, in land administration | Capacity building and performance payments, for example, completed transfers of land rights. |
| Build governance structures that enable local governments and organized communities to collectively prioritize investment. | Incentivize the creation of project boards with equal representation from local government and communities. |
| Establish contracting arrangements that give delivery responsibility to communities. | De-risk local government contracting arrangements to encourage devolved community-led delivery. |

5.3 Enabling Community-led Delivery

Delivery of community-led climate adaptation in informal settlements relies on effective collaboration between government and residents. Inclusive community-led climate action is a co-production, whether it is initiated by communities that want to scale settlement-level activity or by local governments making spaces for community leadership. As a co-production, partners should maximize the benefits of shared knowledge and capacity, with inputs to governance and implementation negotiated at the outset and recorded in a delivery plan. The respective roles of governments and communities are determined based on the context. However, in general, governments and specialist contractors can best deliver large-scale improvements, with organized communities undertaking complementary local actions, which ensure that lowincome households can share benefits.

Delivery can also be structured to disperse adaptation actions at a city level. Improvement and adaptation programs need not be undertaken as single large schemes when the elements can be broken down and parceled out for local level delivery. The ACCA¹¹⁸ program in Asian cities shows how overall impact can be achieved through the delivery of multiple community-led improvements at a settlement level (Box 5 above). With each community identifying priority needs, actions are targeted at the issues and areas requiring investment. Despite each ACCA adaptation being small-scale, the aggregate value and impact can be significant. While this process may require more project management for the funder, the focus on prioritizing local improvements and leveraging household investment makes this model of delivery highly effective.

Designing-in collaboration and local delivery can deliver major climate adaptation improvements. Evidence from Freetown, Sierra Leone shows the effectiveness of incorporating community-led action into large-scale adaptation programs (Box 15).¹¹⁹ In this example, the project has included community leadership from the outset, with manageable roles for grassroots groups delivering tangible adaptation benefits over time. The community and city government have co-designed and co-managed the project, with community groups taking responsibility for the planting and care of trees, providing a long-term role for residents as environmental custodians.

Box 15. Sierra Leone – Freetown the Tree Town Program

Reforestation of Freetown is a pillar of the city climate strategy and has been supported by the World Bank Freetown Emergency Recovery Project to remediate and stabilize steep slopes and reduce the risk of future landslides. Freetown City Council and CBOs jointly designed and manage the Tree Town program. Community members work with the city to identify where trees should be planted to achieve maximum adaptation benefits and have contracts to plant and maintain trees in designated plots across the city. Micro-payments are made, via mobile money, to community growers when trees are planted, and then every two months over three to five years if the trees survive into maturity.

The propagation of trees and mangrove takes place in local nurseries, keeping the economic value in the city and creating employment and training opportunities. Around 80 percent of the total resources leveraged for the project have been injected into local communities, with the remaining 20 percent meeting project costs.

The project employs a digital tracking app system that logs each tree planted, providing a basis for verification and payment for ongoing maintenance. The system incentivizes and rewards community members for planting and caring for trees. The digital record on each tree planted enables trees to be counted together and 'bundled' to attract Corporate Social Responsibility investment by private companies.


RBF can be an important tool to enable community-led delivery of climate adaptations. When there is limited experience within national and local governments with devolved adaptation projects, RBF can help structure delivery around the achievement of progress and output measures. RBF can be used to encourage and reward attainment of targets, meet additional costs created by parceling of contracts, and incentivize governments and the private sector to design more inclusive and contextually relevant climate adaptations (Table 8). When combined with larger capital programs, RBF can enable locally led leadership and community delivery of climate adaptation.

Community-led research has helped highlight the experiences of climate change and its impacts on lowincome communities in Dar es Salaam. Communities are increasingly vulnerable to worsening climate conditions and are locked into short term patterns of coping and recovery, which undermine their longer-term adaptive capacity.

| Objective | Results-Based Finance |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Climate adaptations meet identified local needs | Performance payments and rewards for adaptation to climate risks. |
| Adaptation is at a scale that can be managed by communities, without reducing overall impact. | Incentivize or subsidize community-led small delivery contracts. |
| Community-led action is sustainable over the long-term. | Performance-based contracting, linked to operation and maintenance, ensures the involvement of organized communities. |

Table 8: Using RBF to Enable Community-led Delivery

Spotlight 4: Dar es Salaam

Collaborative and Community Actions

Community-led data collection in Dar es Salaam identified priority actions and strengthening partnerships between residents and the local government to deliver climate adaptation.

Community-led Research, Kombo Settlement



While communities are not passive in their responses to climate change, they cannot fundamentally reduce their vulnerability without support from government. As part of the study, communities identified a series of actions, including improving infrastructure and services; reducing exposure to erosion and flooding; enhancing the resilience of housing and the built environment to climate conditions; and, to reinstate the natural environment, adopting naturebased solutions to deliver sustainable adaptation (Figure 10). These priority actions are connected by closing gaps in data on the experiences and needs of residents of informal settlements, investing in knowledge sharing, and building the capacity of governments and communities to deliver joint adaptation activity. Delivering collaborative climate adaptation will require a shift in how urban development is planned and delivered to make space for community-led action. More inclusive approaches to decision making and more diverse resources and delivery capacity are essential to address the scale and complexity of climate risk. This can partly be achieved through better use of existing government and donor funds, but performance-based finance is also needed to incentivize institutional change and create capacity for problem solving.

Figure 10: Integrated Adaptation Actions, Dar es Salaam





Community Discussions, Kombo

The use of RBF could strengthen collaborative working in Dar es Salaam. Where aligned with the DMDP phase 2 program, it could be used to test and deliver innovative partnership actions that complement and extend major works planned for the city.

When applied to the recommendations made for Pakacha and Kombo, RBF can have a significant role in incentivizing the shifts needed to deliver meaningful change. When aligned with government and donor grant funding, it could unleash community resources and capacity, to make a major impact in Dar es Salaam (Table 9). With the commitment of organized communities in Pakacha and Kombo and the support of local government and donors, there is significant potential to deliver a long-term program of adaptation to reduce climate risks. This recognizes the essential role of community members as full partners in processes of change. The complexity of urban contexts, the scale of need, and the urgency created by climate change make it essential that all actors use their capacity creatively to build inclusive and sustainable cities.

| Adaptation Theme | Example Actions | RBF Funding |
|------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Nature-based solutions | - Settlement greening - Tree planting training | Community contracting with performance payments for planting and maintaining trees |
| Infrastructure and services | - Extend drainage - Improve solid waste management | Subsidy payments to fund sanitation and drainage service extension to settlements |
| Resilient built Environment | - Housing upgrading - Heat-resistant roofs | Incentivize household investment in sustainable housing improvements |
| Closing data and knowledge gaps | - Knowledge hub - Craft skills training - Partnership structu | Funding for grassroots and NGO to develop skills and undertake community research |

Table 9: The Potential for RBF funding in Dar es Salaam

Community-led Environmental Improvements



6. Conclusion

Climate change is severely impacting cities and informal settlements. Evidence clearly shows that overlapping conditions of poverty and exposure to risk are increasing the vulnerability of urban informal settlements to worsening climate conditions. There is an urgent need to focus climate adaptation on the local level to target investment at the people and places that are most affected by adverse weather patterns.

With informal settlements forming the bulk of residential development across the Global South, governments must see communities as part of the solution to climate challenges. They need to upgrade, integrate, and adapt environments and housing and extend the provision of services to include informal settlements as part of the 'formal' city. Increasing pressure from population growth and vulnerability of settlements in at-risk areas means that urban resilience can only be achieved through partnerships championed by governments that create the institutional and finance frameworks to enable local leadership. Community-led climate action can complement national and sub-national climate plans, releasing the local knowledge and resources needed for sustainable change.

A key to meeting the vast cost of urban adaptation is diversifying sources of funding and action that contribute to more sustainable and resilient cities. National climate strategy and infrastructure investment can be enhanced to enable communities to use their local knowledge of risk and link household and collective action into wider programs of settlement upgrading and adaptation. Drawing on community capacity opens huge potential for additional action, currently excluded by top-down 'business-as-usual' approaches to urban development.

Enabling community-led climate action at scale requires a shift in thinking and resources to position communities

as full delivery partners. RBF has a key role to complement public finance and more effectively target underserved and at-risk urban populations, closing knowledge and resource gaps to enable community-led action. Changing ingrained patterns of institutional behavior will require both incentives and investment to create space for more inclusive planning and delivery processes. RBF offers the flexibility to target blockages and de-risk new solutions for the most difficult urban and climate challenges.

Cities and informal settlements face an uncertain future.

Rapid urbanization, worsening climate conditions, and rigid finance and governance systems make it difficult to deliver a transformative urban change. However, the risks to billions of people across the globe make action essential. Using the combined strength of the public, business, and community sectors working together can create the momentum to build resilient and inclusive cities for all.



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