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Financing Climate Resilience in African Cities

A Reference Guide



FEBRUARY 2019

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Chemonics contact:
Chris Perine, Chief of Party (cperine@chemonics.com)
Chemonics International Inc.
1717 H Street NW
Washington, DC 20006

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Cover Photo: Nairobi, Kenya. Photo by Waceke Kamau, May 2012.

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Prepared for:

United States Agency for International Development

Climate Change Adaptation Thought Leadership and Assessments (ATLAS)

Prepared by:

Owen Scott and Basil Mahayni, Chemonics International Inc.

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ACRONYMS

ADB	Asian Development Bank
AfDB	African Development Bank
ARC	African Risk Capacity
ATLAS	Adaptation Thought Leadership and Assessment
DCA	Development Credit Authority
GCF	Green Climate Fund
PPP	Public–Private Partnership
UNDP	United Nations Development Programme
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

BACKGROUND AND PURPOSE

The urban population in sub-Saharan Africa is expected to more than triple between 2010 and 2050, from 298 million to 1.07 billion (UN-Habitat 2014). That translates to more than 770 million individuals taking up residence in sub-Saharan African cities over a 40-year period. Given the enormous strain that will put on already scarce resources, urban management and financing are more important than ever. However, a sizeable funding gap currently exists. The World Bank's Africa Infrastructure Country Diagnostic estimated that sub-Saharan Africa's annual financing needs for infrastructure investments alone total \$93 billion. Of this, only \$51 billion is covered by domestic revenue sources and approximately \$8 billion is covered by international financial institutions, leaving a financing gap of \$34 billion (Gutman, Sy, and Chattopadhyay 2015). Furthermore, World Bank research suggests the additional annual capital costs required globally for urban infrastructure adaptation are \$11 billion to \$20 billion (Hughes, Chinowsky, and Strzepek 2010).

While international donors and multilateral climate funds have a role to play to help bridge the finance gap, cities have a much wider set of tools available to them to finance climate resilience initiatives, many of which are already in use. This document provides an overview of the wide range of finance mechanisms available to governments to fund climate resilience initiatives at both the national and local level. This document then outlines the opportunities and challenges for select finance mechanisms in the context of municipal governments in sub-Saharan Africa and provides illustrative interventions to increase the chance of each mechanism's success.



SHORT TERM (1-5 years)

In the short-term, standard donor-funded project lifecycle of 1–5 years, interventions can focus on strengthening existing mechanisms in the following ways:

- **Municipal revenue generation:** Expanding the tax base, improving tax administration, and tapping underutilized sources of revenue such as environmental taxes, user fees, and service delivery charges.
- **Intergovernmental transfers:** Making the case that a portion of national government grants to municipalities should be earmarked for resilience initiatives through budget tagging.
- **Public–private partnerships (PPPs):** Increasing the number and quality of PPPs that accomplish resilience goals by tapping into one of the many PPP support mechanisms in Africa.

MEDIUM TERM (5-10 years)

In the medium term, over the course of 5–10 years and multiple projects, interventions can focus on building on the successes of short-term interventions aimed at strengthening municipal finance and planning by developing dedicated sources of resilience funding through the following mechanisms:

- **Multilateral or bilateral climate funds:** Assisting municipalities with project design and proposal preparation, and helping them improve their project management, financial management, monitoring and evaluation, and reporting capabilities.
- **Trust or revolving funds:** Helping municipalities create and capitalize a climate change trust fund, water revolving fund, municipal development fund, local infrastructure fund or similar, along with the management, financial, regulatory, and safeguard systems necessary to transparently sustain the fund.

LONG TERM (10+ years)

For most sub-Saharan African countries, developing a functioning domestic capital market in which cities have credit ratings and can issue debt is a long-term goal, requiring sustained effort over 10 or more years. Nevertheless, being able to expand beyond the limitations of an annual operating budget or donor-funded projects and finance major infrastructure initiatives through bonds, loans, and lines of credit should be the eventual goal for major African cities.

RECOMMENDATION

City leaders, international donors, philanthropic organizations, private companies, city residents, and other stakeholders need to shift their thinking on climate resilience from one-off projects driven from the outside to viewing building resilience as an ongoing, recurring expense.

Current infrastructure will need to be climate-proofed, and new infrastructure will need to take climate change into account, often requiring additional measures be taken to ensure the lifetime of infrastructure is maximized. To operationalize this shift in thinking, city officials and other stakeholders will need to include climate change in their policies and regulations, incorporate climate change considerations in their planning and design, and account for the costs of increasing resilience in their budgets. Much like standard infrastructure development or municipal service delivery, funds for building resilience must come from a mix of regular funding sources, including municipal revenue generation, intergovernmental transfers, risk-sharing partnerships, local resilience funds, and eventually issuance of debt on a domestic capital market.

INTRODUCTION

Increasing urban climate resilience requires municipal governments to focus on a number of areas, including updating legal and regulatory frameworks to incorporate climate risk considerations; mainstreaming climate change into policy, planning, and budgeting across departments; and increasing capacity to plan, design, and implement climate-resilient initiatives. Financing these initiatives is often seen as an additional expense to consider within an already insufficient budget. In some cases, climate resilience initiatives will likely require municipalities to seek funding from national budgets, international donors, or the private sector – particularly when capital expenditure for infrastructure is involved. In other cases, cities may find opportunities to self-finance climate resilience programs through improved governance of services and budget management, or through innovative public finance options.

Local context plays a large role in determining the viable options for municipal financing of climate resilience initiatives. Improving resilience and funding needs can vary significantly in cities throughout sub-Saharan Africa for a number of reasons, including physical geography and size, population and demographic characteristics, extent and condition of infrastructure, public service provisions, and relationship with the provincial or national government, among others. These contextual factors should be factored into the design of technical assistance programs for climate resilience projects and in financing the interventions themselves.

This document provides an overview of the wide range of finance mechanisms available to governments to fund climate resilience initiatives at both the national and local level. It then outlines the opportunities and challenges for select finance

mechanisms in the context of municipal governments in sub-Saharan Africa and provides illustrative interventions to increase the chance of each mechanism's success.

REVIEW OF URBAN FINANCE MECHANISMS

Many municipalities in sub-Saharan Africa struggle to effectively manage public services, maintain infrastructure, and plan and implement capital investment projects. The effects of climate change threaten to further erode services and infrastructure, which may lead to increased social vulnerabilities and impede economic development. Awareness about the effects of climate change on cities has grown, and potential financing options for climate resilience interventions have increased. Nevertheless, cities in developing countries face a number of barriers that impede access to funding.

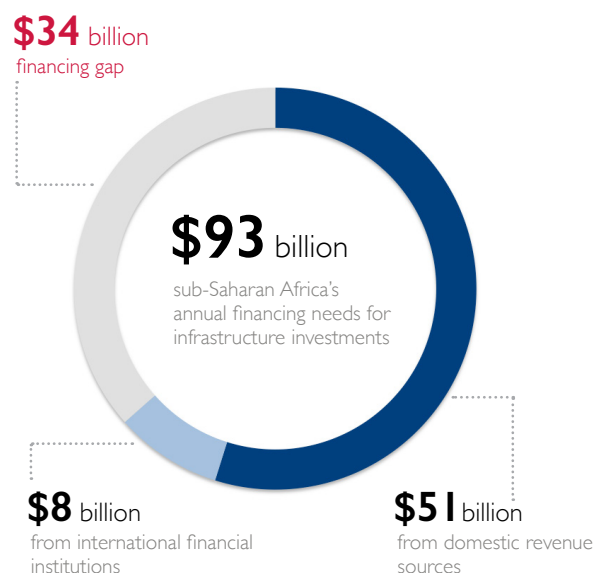
First, many cities have limited capacity for budgeting and collecting domestic revenues. This can create a cyclical effect in which constrained municipal budgets lead to poorer services and limited maintenance of infrastructure. Second, intergovernmental transfers, which can be a key source of municipal funding, can be unpredictable or subject to provincial and national political preferences. Third, while donor institutions are an important source of funding, reliance on donors is unsustainable in the medium and long term. Further, while designated international funds have been established to support climate change resilience interventions, cities often do not have the capacity, systems, or regulations to facilitate successful access to and management of these

funds. Fourth, the private sector, including the banking sector, can play a prominent role in closing the financing gap for urban climate resilience, but many cities in sub-Saharan Africa do not have the capacity or skills to design and prepare bankable projects. They also lack credit ratings, and therefore cannot issue bonds or borrow to finance resilience interventions, while weak regulatory and investment frameworks limit or deter private sector investment.

As analysis of climate change risk continues to gain momentum, attention is increasingly turning to how to finance actions that can respond to identified risks. A large and growing array of financial tools are being applied to fund climate resilience, with new mechanisms also being developed to meet the challenge. To effectively align funding with resilience projects, cities need to be able to plan for climate resilience, design clear interventions, and integrate these initiatives into regular planning, budgeting, and implementation processes. For cities, this means increasing capacity to understand, monitor, and analyze climate change risks and to act to address them. This includes capacity to conduct market assessments of viable financing options, in addition to utilizing municipal planning tools (e.g., zoning, permitting, and enforcement action), and improving revenue collection, public financial management, and project preparation, design, and implementation. Technical assistance programs should therefore focus on improving municipal capacity to provide services, manage infrastructure, and conduct capital investment planning in cost-effective ways. Doing so will translate into greater interest from donors and the private sector. Further, by building capacity for project design, preparation, and implementation, technical assistance providers will enhance the municipal ability to access various types of funds and financing.

URBAN CLIMATE RESILIENCE FINANCE MECHANISMS IN THE AFRICAN CONTEXT

The urban population in sub-Saharan Africa is expected to more than triple between 2010 and 2050, from 298 million to 1.07 billion (UN-Habitat 2014). That translates to more than 770 million individuals taking up residence in sub-Saharan African cities over a 40-year period. Given the enormous strain that will put on already scarce resources, urban management and financing are more important than ever. However, a sizeable funding gap currently exists. The World Bank's Africa Infrastructure Country Diagnostic estimated that sub-Saharan Africa's annual financing needs for infrastructure investments total \$93 billion. Of this, only \$51 billion is covered by domestic revenue sources and approximately \$8 billion is covered by international financial institutions, leaving a financing gap of \$34 billion (Gutman, Sy, and Chattopadhyay 2015).

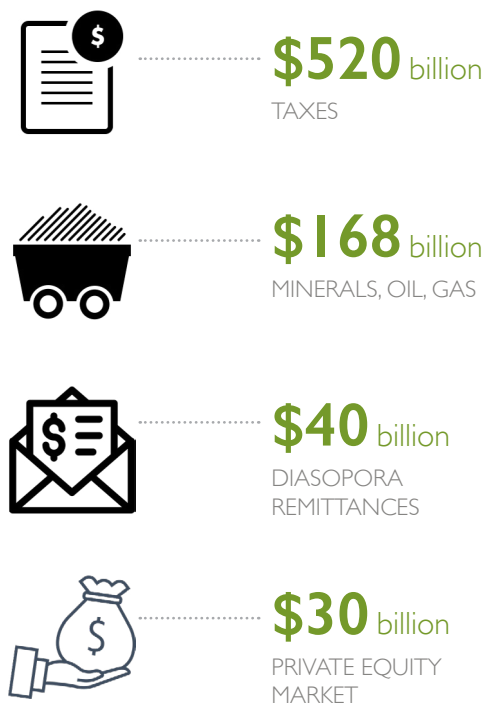


Many African countries are also extremely vulnerable to climate change: of the top 40 countries ranked as most vulnerable by the ND-GAIN (Notre Dame Global Adaptation Initiative) Index, 33 are located in Africa. Increasing climate risks such as sea level rise, floods, droughts, and other extreme events are adding an additional financial burden on cities to both respond to and prepare for such risks. For example, World Bank research suggests the additional annual capital costs required globally for urban infrastructure adaptation are \$11 billion to \$20 billion (Hughes, Chinowsky, and Strzepek 2010). While multilateral climate funds are often seen as the primary solution to closing that financing gap, since 2010, only five projects that specifically target urban resilience have been approved by dedicated climate funds, for a total amount of \$77 million. This equates to less than 5 percent of the \$1.83 billion approved for adaptation

projects by climate funds during the same period (Barnard 2015).

While that percentage is likely to increase in the coming years as urban areas are more frequently targeted by climate funds and donors, the amount of funding available is small in comparison with overall infrastructure investment needs and cannot take the place of long-term investment by governments; cities in developing countries must pursue a variety of sources to fund resilient infrastructure projects. In sub-Saharan Africa, a large disparity in capital markets and financial sophistication exists between two more advanced countries with developed markets (South Africa and Nigeria), a small number of countries that have made strides in improving their regulatory frameworks (e.g., Botswana, Rwanda, Mauritius, Kenya), and the rest of the countries.

Top Domestic Resources in African Countries



Despite the challenges noted above, domestic resources in African countries have grown over the past 20 years, which presents new opportunities for domestically funded projects and initiatives. African countries generate more than \$520 billion annually from domestic taxes and earn more than \$168 billion annually from minerals, oil, and gas – 13 African countries have capitalized on this by establishing sovereign wealth funds. Their central banks hold more than \$400 billion in international reserves and private banking revenues exceed \$60 billion annually. Diaspora remittances to African countries increased to \$40 billion in 2012 and diaspora (i.e., remittance-backed) bonds have the potential to raise an estimated \$5–10 billion annually. Stock market capitalization in Africa rose from \$300 billion in 1996 to \$1.2 trillion in 2007, and the continent's private equity market is worth approximately \$30 billion (NEPAD 2014).

SUMMARY OF FINANCE MECHANISMS

Many of the finance options available to cities are not specific to building climate resilience; rather, they are tested and widely used mechanisms that have been used by cities for decades to finance large infrastructure projects and other initiatives. More recently, cities have been experimenting with using these mechanisms to address climate change, most commonly for mitigation actions. Tables 1-3 provide a summary of many of the options available to cities, grouped by the amount of time a municipality might need to improve access to mechanisms to fund climate-proofing projects and activities.

Table 1. Summary of finance mechanisms: Short term priorities (1-5 years)

TYPE OF MECHANISM	DEFINITION
MUNICIPAL REVENUE GENERATION	Municipalities can generate revenues through levying taxes and imposing service fees. This revenue then funds activities and services provided by a municipality (e.g., trash collection, road maintenance, and safety and security services).
Taxes	Taxes are levied on residents and businesses, and can come in a variety of different forms, including: property tax, personal income tax, corporate income tax or business profit tax, general consumption taxes (e.g., value added tax, goods and services tax, sales tax), payroll tax, excise tax (e.g., vehicle tax and hotel occupancy tax), and fuel tax.
Other revenue sources	<ul style="list-style-type: none"> • User fee: A fee paid by a user who chooses to use a service provided by a government owner, operator, or licensor. Common examples include tolls, license fees, building permits, water or sewerage service fees, national and state park entry fees, and system fees for education and healthcare. • Service delivery surcharge: A fee imposed on a ratepayer's utility or service bill in addition to the base rate charge for the service (and separate from any taxes). Service delivery providers can use surcharges to cover operations and maintenance costs, infrastructure improvements, new builds, conservation efforts, and energy efficiency upgrades, and to cover the cost of natural disaster damage.
DIRECT FINANCING	Direct outside funding that can increase the overall amount of available financing and could make the investment environment more attractive for private investors. Financing can be provided by the public sector, development agencies, impact investors, or the private sector.
Intergovernmental transfers	Funding provided by the central/national government for provinces, states, cities, or municipalities. Funds can be earmarked for specific purposes (e.g., education, health, project-specific) or can flow into the general operations account.
Public-private partnerships	PPPs are partnerships between a government body and a private sector party whereby the private sector provides infrastructure or services that have traditionally been delivered by the public sector. PPPs can take many forms, including: operate; lease/purchase and operate; lease/purchase, build, and operate; build; build and operate; or build, operate, and transfer.
Grants	Nonreimbursable funding usually provided by the public or not-for-profit sectors, or by international and bilateral donors to support a specific activity, project, or institution. Grants can either fully fund a specific activity or project, or can help supplement public sector funds to reduce risk. Grants typically support activities that have social or environmental benefits or support research and development.

Table 2. Summary of finance mechanisms: Medium term priorities (5-10 years)

TYPE OF MECHANISM	DEFINITION
DIRECT FINANCING	Direct outside funding that can increase the overall amount of available financing and could make the investment environment more attractive for private investors. Financing can be provided by the public sector, development agencies, impact investors, or the private sector.
Bilateral and multilateral climate change resilience or adaptation funds	Funds set up by individual countries (e.g., International Climate Fund [UK], International Climate Initiative [Germany]) or using pooled resources from a number of countries (e.g., Green Climate Fund, Global Environment Facility, Global Climate Change Alliance, Least Developed Countries Fund). The funds are used to finance specific projects or initiatives in response to a proposal submitted by a country, usually through a designated entity.
Climate change trust, revolving, and municipal development funds	A fund established at the national or subnational level to fund specific activities (e.g., infrastructure development, priority climate change activities) and administered by the government, international organization, or development bank. Trust funds are typically funded by general government revenues or by dedicated sources of funding such as carbon taxes, environmental user fees, private financing, or donor/multidonor pooled funding. Trust funds can be established as 1) endowment funds with initial capital that is invested to generate the annual income for operations and investments; 2) revolving funds that receive revenue on a sustained basis to cover operations and projects; or 3) sinking funds with an initial capitalization for a limited time until the funds are exhausted and support ends.
Public investment capital	Investment capital from bilateral donors, multilateral or national development banks, or international agencies or funds can reduce requirements for private financing, decrease financing costs, and make financing terms more attractive. Public investments may be particularly effective when used for seed capital (a relatively small, early investment) or a cornerstone stake (a relatively large, early investment) to help leverage additional private capital (OECD 2015).

Table 3. Summary of finance mechanisms: Long term priorities (10+ years)

TYPE OF MECHANISM	DEFINITION
BONDS	A bond is a debt investment in which an investor loans money to an entity (typically corporate or government) that borrows the funds for a defined period of time at a variable or fixed interest rate.
Government (sovereign) bonds	Bonds issued by a national government, typically to support national government spending.
Municipal bonds	Bonds issued by a state, city, or municipality, typically to support infrastructure projects and repairs. Two types include: <ul style="list-style-type: none"> • General obligation bonds: Secured by credit and tax revenue • Revenue bonds: Secured by revenue generated by the project (e.g., tolls, rents, user fees)
Other bonds	<ul style="list-style-type: none"> • Green bonds: Bonds issued to raise capital specifically to support climate-related or environmental projects. Green bonds can be certified as such using existing international standards such as the Green Bond Principles or Climate Bond Standards • Infrastructure bonds: Municipal bonds issued specifically to fund public infrastructure projects, or bonds issued by the private sector with the purpose of financing infrastructure projects of public interest • Diaspora bonds: Bonds issued by a country to its own diaspora. These bonds leverage the savings of a country's overseas population and offer an investment opportunity that contributes to the development of their home country, in lieu of sending remittances. • Social impact bonds: Also known as a pay-for-success contract. This type of bond does not require a credit rating and can be implemented by a municipality through an external institution that manages the issuance of the bond and pays all parties if and when the social policy is achieved. • Catastrophe bonds: Bonds that are usually insurance-linked and meant to raise money in case of a catastrophe such as a hurricane or earthquake.

Table 3. Summary of finance mechanisms: Long term priorities (10+ years) cont'd

TYPE OF MECHANISM	DEFINITION
OTHER DEBT INSTRUMENTS	Debts in which a borrower is given or provided access to funds (typically by a bank) for a defined period of time at a variable or fixed interest rate.
Lines of credit	<p>A bank and a borrower (e.g., city) agree on the maximum amount that will be available under the line of credit, typically backed by the credit of the borrower. The borrower then draws down against the line of credit up to the agreed-upon limit.</p> <ul style="list-style-type: none"> • Green line of credit: Similar to a line of credit, but specifically earmarked for lending to projects that have significant environmental benefits (e.g., renewable energy, energy efficiency, resiliency upgrades) and might otherwise not be able to access financing on reasonable terms.
Loans	Loans provide borrowers an agreed amount of capital up front. In return, borrowers agree to repay principal plus interest and fees on a specific schedule.
RISK MITIGANTS	Risk mitigants increase investment opportunities by minimizing or sharing the potential risks to both the borrower and investor. Risks include natural disaster or other catastrophic events, project delays, exchange rate fluctuations, economic changes or market fluctuations, etc.
Insurance	Insurance is a contract with an insurer, represented by a policy, in which an entity receives financial protection or reimbursement against financial losses in return for the payment of a premium. Many types exist, including micro-insurance, parametric insurance, catastrophe insurance, general liability insurance, building insurance, project insurance, weather index-based insurance, and political risk insurance.
Loan guaranty	A guaranty provided by a third party in the event the borrower defaults (can be for prespecified causes or any cause). The agreement protects the lender and allows access to loans for entities that typically would not qualify for a loan based on their credit rating. USAID's Development Credit Authority (DCA) is an example, as are regional development banks.
Reinsurance	Reinsurance is insurance purchased by an insurance company from one or more insurance companies directly or through a broker to transfer risk, mitigate tax risk, or pool risk.
National municipal corporation	An umbrella department housed in a national ministry set up to support municipalities with technical cooperation and consulting expertise. It can also be set up to offer loans or guarantees that encourage pooled investments schemes. For example, development banks can offer credit directly to the municipal corporation, which would act as a guarantor for all municipalities.
Securitization	Securitization is the process of taking a group of assets (usually undiversified or high-risk) and turning them into a security that is backed by the assets through financial engineering. Examples include mortgage-backed securities, receivables or future flow receivables securities, and remittance securities.

FINANCE OPTIONS FOR SUB-SAHARAN AFRICAN COUNTRIES

Although many countries in sub-Saharan Africa have made strides to improve their regulatory environment for investments, improve their capital markets, and increase their domestic revenue generation, those improvements frequently do not translate to the municipal level. For example, only South Africa has cities with credit ratings and a municipal bond market, and those mechanisms are constrained to the largest and most developed cities (e.g., Johannesburg, Cape Town). Climate resilience therefore needs to be integrated with technical assistance programs to improve funding for municipal services. This can be accomplished by mainstreaming climate resilience considerations into budgeting and planning, identifying and costing out infrastructure climate-proofing needs, and working with the national government, donors, and the private sector to close funding gaps.

In the short term, the vast majority of municipalities in sub-Saharan Africa need support to focus on increasing local revenue generation through more efficient services and management of infrastructure. This can be accomplished through building capacity for budgeting, accounting, planning, and project management to improve financial management systems and processes, develop realistic capital investment and improvement plans, and increase the overall efficiency and cost-recovery of services. Building this capacity is also crucial for incorporating climate change resilience considerations into the financial and technical elements of municipal planning and delivery of public services. In the

medium and long term, planning, financial, and project management skillsets will also help cities throughout the continent to achieve resilience by supplementing domestic revenues with external funding for climate resilience projects. To access these grants, loans, and investments, municipalities need support to strengthen partnerships and better understand the processes, rules, and regulations that guide donor institutions, climate resilience fund managers, and private investors.

Overall, the skills and expertise required by municipalities to improve funding for climate resilience in the short term will also facilitate increased capacity for preparing project proposals for climate funds, donors, and private investors. Municipal climate resilience programs in sub-Saharan Africa should be locally contextualized in that the deficits in technical capacity and appropriate funding sources will vary from city to city due to local and national regulatory frameworks, prior experiences with municipal planning and project management, and the risks posed by climate change. Below is a summary of prioritized finance options grouped by the amount of time and type of support a municipality might need to improve access to mechanisms to fund climate-proofing projects and activities. Also presented for each mechanism is a selection of illustrative activities a donor could support to improve the capacity of a municipality to effectively use that mechanism to increase climate resilience.



1-5 YEARS

Short-Term Finance Options

SUMMARY OF OPTIONS

SHORT-TERM

MEDIUM-TERM

LONG-TERM

FINANCE MECHANISMS TO PRIORITIZE IN THE SHORT-TERM

1. **Municipal revenue generation** (taxes, user fees and service delivery charges)
2. **Intergovernmental transfers**
3. **Public-private partnerships**

All cities in sub-Saharan Africa would benefit from improving their own source revenue and their management of local revenue and grants provided by the national government, and from developing and strengthening partnerships with the private sector. For most donors, interventions aimed at addressing deficiencies in these areas and tying these finance mechanisms to climate resilience goals could be accomplished in a standard project lifecycle of 1–5 years. To the left is a list of mechanisms covered in this section, followed by detailed summaries of the mechanisms, available support programs/initiatives and illustrative interventions to improve their effectiveness in funding climate resilience initiatives

I. MUNICIPAL REVENUE GENERATION

For rapidly developing countries in sub-Saharan Africa, municipal revenue is important for maintaining the quality and financial sustainability of services and infrastructure. With the effects of climate change increasingly clear, the importance of municipal revenue will increase as funding resilience projects (or covering the additional costs of adding climate-resilience elements to previously planned projects) becomes more of a priority. Many municipalities, however, fail to adequately collect sufficient revenues from taxes and user fees to cover operations and maintenance costs, let alone fund climate resilience programs. For example, many sub-Saharan African countries have low tax-to-GDP (gross domestic product) ratios, indicating that room remains to increase domestic revenue generation. The average tax-to-GDP ratio for high-income countries is 15.0 percent, whereas the average for low-income countries is 11.1 percent (Brixiova et al. 2011). Six countries in sub-Saharan Africa (Central African Republic, Democratic Republic of the Congo, Ethiopia, Liberia, Nigeria, and the Sudan) have ratios that are less than 10 percent (UNECA 2014).

Domestic revenues, however, are an important source of sustainable funding for municipalities that, when effectively collected, can yield multiplier effects in the form of improved services, increased confidence in local service providers, funding for infrastructure and climate resilience programs, and greater investment interest from donors and the private sector. In some cases, funding climate resilience projects can be achieved through improved collection of domestic revenues. In other cases, additional dedicated revenues will be required to fund climate resilience projects, such as climate-proofing grey infrastructure, or green infrastructure projects.

INCREASING MUNICIPAL REVENUE: A PRIMER

Three areas in particular can help increase national and municipal revenue: expanding the tax base, improving tax administration, and tapping underutilized sources of revenue such as environmental taxes, user fees, and service delivery charges. Expanding the tax base can be a sustainable source of funding for municipal climate resilience projects when effectively managed and administered. An effective tax system requires strong and effective local administration, transparent application of the taxes, and mechanisms to respond to taxpayer questions, confusion, and resistance. Property taxes in particular tend to offer a number of advantages as a basis for increasing revenues to meet local needs. For example, real property has a fixed location, which can make it easier to assess value. Property taxes also tend to be more progressive as ownership of real property is more concentrated in upper-income groups, and they tend to have less of a dampening effect on economic activities.

The ability to expand the tax base, however, may be affected by national, state/provincial, and local tax policies, regulations, and laws that may stipulate the types of taxes that can be collected and the distribution of tax revenues. In many Francophone countries in sub-Saharan Africa, for example, taxes collected at the municipal level are transferred to the central government before being dispersed back to municipalities. The tax base in many cities in sub-Saharan Africa may also be constrained by the degree or extent of informality in land tenure and economic activity, as this can impede a municipality's ability to assess value, levy, and collect taxes – especially when reporting mechanisms and incentives to report income, sales, and property are inadequate or nonexistent.

Technical assistance programs can help municipalities in sub-Saharan Africa overcome these challenges by supporting them in assessing tax options, structuring and levying taxes, collecting tax revenues, and budgeting revenues to fund climate resilience projects. In the case of property taxes, for example, technical assistance activities can help municipalities develop a reliable property registration system and transparent methodology for assessing property values. Cities can harness low-cost Geographic Information System technologies to develop up-to-date cadasters featuring relevant data, including descriptions of property and infrastructure, ownership records, and the assessed value of land and improvements. A complete inventory of all parcels with assigned tax identification numbers allows for accurate tracking of tax assessments, levying, and collecting land- and property-based taxes in a consistent and fair manner (e.g., property taxes, recurring land value or estimated land value taxes, betterment levies) from private owners, businesses, and developers.

Because many municipalities in sub-Saharan Africa will not have well-developed land cadasters, technical assistance providers should identify opportunities for achieving “quick wins” to facilitate the design and building of a cadaster. For example, cities may focus first on documenting and assessing the value of commercial and industrial properties, along with raising public awareness about the distributed benefits that can be derived from taxes. Awareness campaigns are particularly important, as land-based finance instruments must consider cultural norms and legal protections regarding land rights and ownership.

Fees, permits, and licenses are a valuable domestic revenue resource. Municipalities use these instruments to recover the costs of public services for urban residents, visitors, and commercial enterprises in addition to funding infrastructure rehabilitation and expansion projects. Environmental user fees, for example, can help offset the environmental impact from tourism activities. As a user-based fee, they may be imposed

through airport entry/exit fees or as a hotel occupancy surcharge. Transportation fees are another example of user-based charges municipalities can collect to help regulate or reduce emissions and fund climate-resilience public transportation projects. Such fees include peak fares on public transportation, such as rail or bus, in addition to automobile emissions fees, toll ways, and ferry fees. Municipalities can also apply environmental fees for water, wastewater, and sanitation services to fund climate-proofing of relevant infrastructure and environmentally friendly services.

Other user fees include marriage and birth registration, automobile registration, business or professional license fees, and permits for construction or use of public spaces. These revenue streams may not be specifically dedicated to funding climate resilience, but improving revenue collection overall will help free domestic resources for climate-resilient projects. Excessive fees, however, may encourage nonpayment or use of unregulated services, or disproportionately affect low-income households. Technical assistance providers can help municipalities in sub-Saharan Africa evaluate the types of fees, and appropriate rates, along with streamlining permitting systems and approval processes, and utilizing online or mobile phone technologies for registration and fee payment purposes.

A third source of domestic revenues is service delivery charges levied on urban residents for use of various municipal services like water, power, and sanitation. The cost of services should account for operating costs and capital investment needs for infrastructure maintenance and expansion, while levied rates for municipal, commercial, and industrial customers should factor seasonal consumption patterns, rates or volumes of consumption or usage, and customer profile. Municipal water prices, for example, should be set differently for urban residents and commercial entities. Pricing can also help regulate usage, particularly when there is peak demand for services, in addition to encouraging conservation when resources, such as water, are scarce. Additionally, utilities surcharges are not widely used in developing countries, but in many countries where the utilities are parastatal, utilities could impose an environmental services surcharge on all customers or on certain customers (e.g., large and/or multinational businesses) to fund infrastructure climate-proofing initiatives.

In many countries, municipalities do not have the authority to set prices for public services. Rather, prices are set by regulators, provincial institutions, or national ministries. Regulators can be an important institution for evaluating and determining fair and accurate prices, in addition to holding service providers accountable, but the degree of independence held by a regulator can vary from country to country. Provincial or national institutions may hold political influence over rate setting or may include political considerations in rate-setting decisions. In cases when municipalities have authority over rates, they may not have the capacity or understanding to set accurate, yet fair, prices for services. Technical assistance providers, however, can help municipalities and rate-setting institutions with rate evaluation and reform programs.

Additionally, development programs can help municipalities improve revenue generation by reducing losses through more efficient service delivery and strengthened public financial management systems. For example, building capacity in budgeting, accounting, reporting, and auditing processes can yield improved public financial management, and, in turn, increase the efficiency and cost-effectiveness of municipal service delivery and other core functions. Such technical assistance can be paired with capacity building in capital improvement planning, and project management, so that municipalities can better forecast and implement capital investment programs for increasing climate resilience. In the short term, this will assist with both more effectively managing domestic revenues and attracting additional investment from outside sources.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Cities Alliance

A partnership of bi-lateral and multi-lateral development agencies, governments, NGOs and other organizations that provides technical support and grants to local and national actors to strengthen local governance. Since 2000, Cities Alliance has awarded more than 400 grants totaling \$110 million in more than 80 countries, addressing a range of themes including local governance and climate change (Cities Alliance 2018).

Global Observatory on Local Finance

Hosted by United Cities and Local Governments (UCLG) the observatory aims to share information on local and regional governments finance and structure, based on a broad statistical study on the state of local finance in 101 countries, and provide local and regional governments with tools to improve financial means and capacities (UCLG 2018). UCLG Africa has completed the analysis of 30 African countries, and aims to complete the other 24 by the end of 2018.


Urban & Municipal Development Fund for Africa

Managed by the African Development Bank and funded by the Nordic Development Fund, the UMDFA was created in 2018 to support African cities and municipalities to better manage urban growth and climate-resilient development by improving governance and quality of basic services. The fund will primarily finance project preparatory consultancies and connect projects with funding sources (NDF 2018).

World Bank

The World Bank has been the most active donor globally in municipal development; during the period of 1998-2009, the bank committed \$14.5 billion to 190 municipal development projects, 27 percent of which were in sub-Saharan Africa. More than half off the total projects focused on municipal finance (WB 2009). The WB also hosts trainings, including Municipal Finances - A Learning Program for Local Governments. Examples of relevant projects include the \$200 million Lagos Metropolitan Development and Governance Project, the \$98 million Tanzania Local Government Support Project, and the \$20 million Municipal Financial Management Technical Assistance Project in South Africa.

ILLUSTRATIVE INTERVENTIONS

 **Property taxes:** Organize workshops explaining the basics of property taxes. Deliver technical assistance to design and build cadaster maps beginning with registered properties, such as commercial or industrial locations, using mixed-methodology surveys to collect geospatial coordinates to define boundaries, catalog property improvements and registration information, and geo-tag photographs. Develop transparent methodology for assessing land and property values and tax assessments. Train municipal staff to assess tax revenue allocation options and create tax budgeting and payment systems. Organize community engagement activities to solicit feedback and raise awareness. Pilot application and gradual expansion of property tax application.

➡ **Public transportation rates:** Provide technical assistance to complete budget analysis of revenues against operating and capital investment costs, including climate resilient cost analysis. Assess utilization of public transportation at peak and non-peak hours. Assess rate options for peak and non-peak fares using financial forecasts and demand sensitivity analysis. Organize community engagement activities to solicit feedback and raise awareness. Pilot application of peak fares and assess impacts on ridership.

➡ **Improved revenues for municipal sanitation:** Assess service coverage and budget analysis for operations, capital investment, and climate resilience projects. Evaluate cost recovery and losses through an analysis of customer data and bill payment. Strengthen public financial management by integrating IT systems and improving budgeting, accounting, reporting, and auditing skills. Create more efficient systems with institutional strengthening of human resources through clear lines of reporting and clarified roles and responsibilities to reduce inefficiencies and redundancies. Strengthen customer engagement through regularized bills, customer service centers, and bill payment through mobile money or electronic payment platforms.

2. INTERGOVERNMENTAL TRANSFERS

Intergovernmental transfers are a crucial source of funding that allow municipalities in developing countries to cover the cost of local services and infrastructure. Intergovernmental transfers can be general purpose or earmarked. General purpose, or unconditional, transfers allow municipalities to spend in line with locally determined priorities. Earmarked, or conditional, transfers are intended for a specific purpose as determined by the central government. Both earmarked and non-earmarked transfers can be either mandatory or discretionary. In some cases, legal frameworks, often related to decentralization programs, require the central government to obligate funds for municipalities. Discretionary grants, on the other hand, are not legal obligations and can vary widely in their size and conditions. Transfers help cover budget deficits at the subnational level and facilitate greater equity between municipalities through a reallocation of resources between wealthier and poorer municipalities. In some countries, however, intergovernmental transfers are influenced by politics and electoral trends at the local and national level. As a result, intergovernmental transfers are not always regular or predictable sources of local funding.

Because of the limited capacity to generate revenues and attract financing, municipalities in developing countries are generally more reliant on intergovernmental transfers than municipalities in developed countries. On average, 70–72 percent of local government funding flows from higher to lower tiers of government in developing countries, as compared to 38–39 percent in developed countries (Alam 2014 cited in UNCDF 2016). Transfers from the national government in sub-Saharan African countries are often a crucial, if not the primary, source of funding for municipalities (Fjeldstad and Heggstad 2012). Intergovernmental transfers in sub-Saharan Africa can differ by region. Research shows that intergovernmental transfers cover a significant portion of municipal income in Anglophone countries in sub-Saharan Africa.

Francophone countries, on the other hand, tend to have much lower transfer rates (IMF 2015 cited in UNCDF 2016). In fact, local laws limit tax levying and fee collection by municipalities in some West African countries. Rather, local taxes are set by, and paid to, the national government, which significantly constrains the ability of municipal government to deliver services and invest in climate resilience projects (UNCDF 2016). Both Anglophone and Francophone countries in sub-Saharan Africa face significant challenges in meeting their local expenditure as transfers are often inadequate and unreliable. For example, in Senegal, revenues at the local level increased in recent years but remain a mere 6 percent of the central tax revenues. Yet intergovernmental transfers can also help yield improved revenue collection at the municipal level. In Tanzania, research has shown that a 1.0 percent increase in intergovernmental transfers leads to an extra 0.3-0.6 percent increase in own source revenue generation for local government authorities (Masaki 2016 cited in UNCDF 2016).

In light of these disparities and challenges with intergovernmental transfers, technical assistance programs should carefully consider the country context and the linkages between municipal budgeting systems with national budgeting processes. This is particularly important for funding climate resilience projects in cities throughout sub-Saharan Africa. Planning for climate resilience should be coordinated between municipal, provincial, and national governments to strengthen stakeholder engagement, clearly delineate functional responsibilities, and determine financing options. Technical assistance can help municipalities align the estimated costs of increasing climate resilience with potential sources of funding, such as local revenues, governmental transfers, private investors, and donors.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Climate budget tagging

A number of innovative approaches for aligning mitigation and resilience funding with local and national needs are currently being implemented by the United Nations Development Programme (UNDP) in a number of Asian countries. Experience in these countries has shown that budget tagging enabled them to make the case for new public, private, or donor investments. By tagging these expenditures, ministries and municipalities have been able to link local planning with sector-based national planning, which has proven effective in increasing financial flows from national budgets specifically for climate-resilience activities (Le and Baboyan 2015).

- **In the Philippines**, the Department of Budget Management (DBM) and the Climate Change Commission (CCC) jointly developed the Climate Change Expenditure Tagging (CCET) framework, which is required at the national level. The CCET was flowed down to local government units to facilitate climate budget tagging in their Annual Investment Plans. The government also created a comprehensive guidebook on CCET for local governments.
- **In Indonesia**, mitigation budget tagging is mandated by ministerial decree at the national level using the Low Emission Budget Tagging and Scoring System (LESS). After rolling out the national-level system, LESS was piloted in three provinces.

- In **Nepal**, the National Planning Commission (NPC) developed a climate budget tagging procedure at the programmatic level in 2012, and in 2014, the Ministry of Finance incorporated the climate tag in its budget system.
- **Bangladesh** developed a Climate Fiscal Framework (CFF) to improve the management of climate-related activities and better link them to the national budget process. The government subsequently rolled out a Climate Expenditure Tracking Framework (CETF) for line ministry budget submissions as well as ODA (Official Development Assistance) budgets.

ILLUSTRATIVE INTERVENTIONS

- ➡ **Earmarking for climate resilience:** Organize workshops to raise awareness about urban climate resilience needs among national ministries involved in budgeting and distributing intergovernmental transfers. Provide technical assistance to standardize fiscal allocations from central governments to subnational units to fund climate resilience projects. Create standardized criteria for assessing and allocating climate resilience funding through intergovernmental fiscal transfers.
- ➡ **Strengthening legal, regulatory, and policy frameworks:** Assess strengths and deficiencies in legal, regulatory, and policy frameworks for intergovernmental transfers to subnational units. Organize workshops to facilitate buy-in to recommended reform processes to create more transparent and efficient allocation processes to subnational governments. Identify champions of intergovernmental transfer reforms, with particular focus on climate resilience. Create facilitated reform process with stakeholder representation from key national ministries and local stakeholders to strengthen linkages between national and subnational units of government.
- ➡ **Strengthen advocacy capacity of municipal governments:** Organize workshops to strengthen understanding of intergovernmental transfer policies and systems at the municipal level. Identify opportunities for raising awareness about municipal climate resilience needs at the national level. Deliver capacity building and technical assistance to create clear communication plans featuring climate resilient financial and infrastructure requirements, in addition to presentations of cost/benefit analysis. Through technical assistance, align climate resilient infrastructure plans with funding opportunities through intergovernmental transfers.

3. PUBLIC-PRIVATE PARTNERSHIPS

Public–private partnerships (PPPs) have long been an option for governments to mobilize capital to design, build, and operate public infrastructure facilities by partnering with the private sector; with the added benefit of receiving revenue through fees charged to users or payment from the public sector. The private sector brings capital and knowledge, in addition to access to technology and management practices that can result in greater efficiency. With PPPs, financial and legal risk, responsibility, and reward are shared among partnering institutions, helping facilitate projects that otherwise might not be realized. PPPs can also

allow cities to designate scarce resources to cover public projects, such as climate-proofing or resilience programs, that may not attract private investors in the short term.

PPPs in sub-Saharan Africa have grown quite prominent in the last 30 years. Throughout the continent, growth in the level of total financing for infrastructure PPPs increased from \$40 million in 1990 to \$174.5 billion in 2017 (World Bank 2018a), with South Africa and Nigeria leading in the number and value of deals, followed by Kenya, Uganda, Rwanda, and Tanzania. PPPs are particularly well suited for municipalities and can be broadly used for public services, such as public transport or water supply, or infrastructure management, such as highways. PPP arrangements can take many different forms (World Bank PPPIRC 2016), including:

- **Utility restructuring, corporatization and decentralization**
- **Civil works and service contracts**
- **Management and operating agreements**
- **Leases / affermage**
- **Concessions, Build-Operate-Transfer (BOT) or Design-Build-Operate (DBO) agreements**
- **Joint ventures and partial divestiture of public assets**
- **Full divestiture**
- **Contract plans and performance contracts**

Due to the requirement for the private sector partner to receive a financial return on investment, PPPs in the climate space have primarily been for low-emissions projects that satisfy mitigation objectives (e.g., solar photovoltaic arrays, wind farms). Partnerships that focus on resilience and adaptation have been more difficult to foster and tend to focus on integrating climate resilience and risk sharing into infrastructure projects.

PPPs can significantly strengthen a municipality's ability to implement climate resilience projects as long as the risks are carefully considered. First, for a PPP to succeed, a careful balance is required between the interests of the municipality, the interests of local residents or customers, and the private partner(s). Second, a strong regulatory environment and institutional frameworks are needed to minimize risks of corruption and ensure a transparent procurement process, accountability for performance, and contractual and financial compliance. Third, PPPs need to be designed to address local climate resilience needs, attract investor interest, and align with governmental capacity to design, tender, and manage the contract. This requires careful project planning, design, cost analysis and forecasts, and coordination between sectors and stakeholders to ensure that projects minimize risk to the public and private sector partners and achieve best value and bankability.

Regardless of the scope, PPPs need to be responsive to the local context, and PPP designs should carefully assess the transfer of assets and liabilities in addition to potential transformations or engagements with civil service employment rules. For example, tension may arise when staff employed under the PPP benefit from higher salaries while their public sector counterparts are subject to civil service employment and compensation regulations. Lack of clarity around a PPP's contract management, regulation, performance requirements, and enforcement systems can also lead to implementation failures.

In some countries, PPPs are best managed through a dedicated PPP unit or department. PPP units often sit within a centralized institution to: oversee the policy, legal, and regulatory frameworks for PPPs; ensure that PPPs are integrated with overall planning and financial systems; align PPPs with local interests; and promote PPPs domestically, regionally, and internationally. One successful example is the South Africa PPP Unit, endorsed by the South African Cabinet in 1999. With technical assistance from USAID and other donors, the PPP Unit was established within the Budget Office in the National Treasury and oversees a project development facility that helps fund local PPPs.

Technical assistance programs should aim to build capacity in all phases of the PPP project lifecycle, which includes the inception, feasibility study, procurement, development, delivery, and project closeout. Agencies implementing donor-funded projects in support of developing PPP capacity at the municipal level should complete an institutional, legal, regulatory, policy, and stakeholder analysis to identify opportunities, quick wins, and champions of the PPP process. This will help clarify the frameworks through which PPPs can be designed, prepared, tendered, and implemented. Technical assistance programs should also work with local stakeholders to identify bankable projects that can be realistically implemented with minimal risk.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Numerous programs are available to support the development of PPPs, including:

USAID's Global Development Alliance (GDA) program

As USAID's primary PPP program, GDA engages corporations, local businesses, financial institutions, investment firms, private foundations, and others to leverage local funds to increase the impact of USAID programs. In sub-Saharan Africa, major GDA programs in the climate space (both mitigation and resilience/adaptation) include Power Africa, Grow Africa, and the Water & Development Alliance (in partnership with Coca-Cola). Since 2001, GDA has established more than 1,500 private sector alliances, leveraging more than \$20 billion (USAID 2015).

USAID's Office of Private Capital and Micro-Enterprise (PCM)

PCM engages investors to reduce risk, primarily by supporting direct transactions and facilitating investment partnerships. In the climate space, PCM supports the Sustainable Development Investment Partnership (SDIP), a collaborative initiative comprising public, private, and philanthropic institutions that is seeking to mobilize \$100 billion in finance for sustainable and climate-resilient infrastructure. SDIP uses development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets, reducing the risk for investors and increasing the pipeline of bankable projects (USAID 2016b).

World Bank's Global Infrastructure Facility (GIF)

The GIF provides design, preparation, structuring, and transaction implementation support to governments to help them bring well-structured and bankable infrastructure projects to market that can attract a wide range of private investors. The GIF specifically focuses on climate-smart projects in the energy, water, and transport sectors and provides support worldwide. Thus far the GIF has approved eight projects in sub-Saharan Africa.

World Bank's Public-Private Infrastructure Advisory Facility (PPIAF)

Instead of focusing on developing PPPs, the PPIAF is dedicated to strengthening the policy, regulatory, and institutional underpinnings of private sector investment in infrastructure in emerging markets and developing countries to make private investment easier and more attractive. Thus far the PPIAF has primarily focused on water and transport infrastructure but does have two relevant subnational technical assistance programs that focus on developing creditworthiness and increasing access to infrastructure financing. Since 1999, the PPIAF has had 120 activities in 39 sub-Saharan African countries (World Bank 2018c).

Africa50 Infrastructure Fund

Financed by 25 African governments, two central banks, and the African Development Bank (AfDB), Africa50 focuses on medium- to large-scale power and transport infrastructure projects that have a significant development impact while offering an appropriate return to investors. The fund invests in project development as well as financing for fully developed projects. Thus far it is only involved in three power projects, but is looking to expand into transport, water, sanitation, and other infrastructure subsectors (Africa50 2018).

Emerging African Infrastructure Fund (EAIF)

An initiative of the Private Infrastructure Development Group and funded by seven European governments and two private banks, the EAIF provides flexible loan products to sub-Saharan African countries for infrastructure projects in eight sectors, including transport, water and waste water, and energy. The EAIF has completed more than 64 projects since 2002, attracting more than \$10 billion in private investment (EAIF 2016).

African Water Facility (AWF)

Hosted and managed by the AfDB, the AWF provides grants and technical assistance to mobilize investment in water projects in sub-Saharan Africa. The AWF has supported more than 100 projects since 2004, with about 75 percent of its projects having a climate resilience component. Many of the projects are focused on urban water and sanitation services, in cities such as Windhoek (Namibia), Freetown (Liberia), and Kinshasa (Democratic Republic of the Congo) (AWF 2018).

South African National Treasury PPP Unit

While South Africa's PPP Unit only provides support for projects in South Africa, it serves as a valuable model that could be replicated in other countries. The PPP Unit provides in-house support across the project lifecycle, including identifying project opportunities, providing technical assistance to public institutions through project feasibility, procurement, and management support, developing the regulatory framework, and providing best practice guidance and training.

Project Preparation Facilities Network (PPFN)

Hosted by the Infrastructure Consortium for Africa, the PPFN serves as a coordinating body of funding facilities and institutions dedicated to developing sustainable infrastructure in Africa through improving project preparation and increasing the number of viable investment-ready infrastructure projects.

ILLUSTRATIVE INTERVENTIONS

-  **PPP technical assistance:** Deliver direct technical assistance to train municipal staff in PPP project lifecycle, including project inception, feasibility studies, procurement, project development, delivery, and project closeout. Facilitate trainings for municipal staff in PPPs and organize workshops with key stakeholders addressing topics such as the basics of PPPs, procurement and tendering systems, contract management, and sector-specific PPP opportunities.
-  **Strengthening the PPP Unit:** Design an organization and implementation plan for the PPP unit, with clear mandate, mission, goals, and objectives. Define roles and responsibilities of PPP unit staff, with clear compensation and performance guidelines. Draft strategic plan and methodology for evaluation and updates. Clarify legal, regulatory, and policy frameworks to ensure the PPP unit can fulfill its mandate.
-  **PPP awareness:** Develop and launch communication strategy that explains PPPs to the general public. Develop PPP marketing strategy for local, regional, national, and international markets. Create centralized hub of PPP information, including procurement opportunities, rules and regulations, procurement processes, and contact information.



5-10 YEARS

Medium-Term Finance Options

FINANCE MECHANISMS TO PRIORITIZE IN THE MEDIUM-TERM

1. Bilateral and multilateral climate change resilience or adaptation funds
2. Climate change trust, revolving, and municipal development funds

In addition to improving the management of local revenue, cities in sub-Saharan Africa should begin looking at mechanisms to access outside funding specifically for climate resilience initiatives. In general, accessing bilateral or multilateral resilience or adaptation funds would be a medium-term goal for cities in sub-Saharan Africa, as most do not have in-house capability to prepare and submit project proposals, effectively manage project implementation, or provide the transparent financial management and reporting required. Interventions aimed at addressing deficiencies in these areas which then lead to a city successfully accessing resilience or adaptation funds or establishing a fund would likely take a prolonged level of support over the course of a couple project lifecycles. To the left is a list of mechanisms

covered in this section, followed by detailed summaries of the mechanisms, available support programs/initiatives and illustrative interventions to improve their effectiveness in funding climate resilience initiatives.

I. BILATERAL AND MULTILATERAL CLIMATE CHANGE RESILIENCE OR ADAPTATION FUNDS AND PROJECTS

Climate change resilience or adaptation funds are a small but promising finance option that can support municipalities in sub-Saharan Africa to achieve their climate resilience goals. According to the [Climate Funds Update](#) dashboard, a total of 24 funds have been established, with national governments around the world pledging approximately \$30 billion to these funds, though to date, only \$22 billion has been transferred in the form of grants. In 2017, multilateral climate funds approved \$2 billion for 152 projects in 70 countries, with the Green Climate Fund (GCF) approving over \$1 billion of these projects (Watson, Bird, and Schalteck 2017). Between 2003 and 2017, 558 projects worth approximately \$3.7 billion were funded in sub-Saharan Africa, representing nearly 23 percent of all approved projects (Watson, Bird, and Schalteck 2017). A vast majority of these funds, however, continue to focus at the national level and on mitigation, concentrating on energy efficiency, renewable energy, and sustainable transport (Buchner et al. 2017). With growing recognition of the importance of municipal climate resilience needs in sub-Saharan Africa, technical assistance programs have the opportunity to get ahead of these funding gaps by building on existing capacity and strengthening local institutions so that cities throughout the continent can be ready to successfully access these funds and implement climate resilience projects. Technical assistance programs should focus on three issues in particular:

SUMMARY OF OPTIONS

SHORT-TERM

MEDIUM-TERM

LONG-TERM

First, climate change resilience or adaptation funds require municipalities to prepare clear climate-proofing and resilience project proposals. For most developing countries, the highly specialized technical expertise and knowledge of donor organization business practices needed to design projects and submit proposals to climate funds are limited at the national level, and are typically well beyond the capacity of municipalities. Bilateral and multilateral donors are addressing this challenge by providing assistance for project preparation. This includes support for preparation of prefeasibility and feasibility studies; environmental, social, and gender impact assessments; risk assessments; monitoring and evaluation; and precontract services and financial structuring. Project preparation assistance is crucial if municipalities in sub-Saharan Africa are going to successfully access project funding for increasing climate resilience of services and infrastructure. This assistance can also yield long-term benefits in that built capacity for project preparation, design, and funding applications can help municipalities catalyze additional sources of funding from other donors and the private sector.

Second, the viability and accessibility of these funds for municipalities in sub-Saharan Africa should be assessed on a country by country basis, with specific assistance provided to improve access to funding where viable funding opportunities exist. For example, in South Africa, a small number of major metropolitan areas have the financial acumen and technical expertise to prepare proposals. These cities could serve as a local resource that can be leveraged through twinning programs to train municipal staff in smaller cities and towns that have limited experience with project preparation and proposal development. Joint applications between cities and independent peri-urban areas should be considered, particularly when infrastructure such as public transportation systems is shared, or a common-interest or benefit can be generated.

Similarly, national government ministries or national development agencies should be considered an additional resource to leverage to supplement municipal capacity and to build a centralized institutional hub of knowledge and expertise that can, in the long term, serve as a resource for other municipalities. This will also help ensure compliance with national policies and regulations with regard to donor financing for climate resilience programs.

Third, building municipal capacity to effectively manage these grants is required. For most municipalities in sub-Saharan Africa, particularly those in Least Developed Countries, technical assistance should focus on building project and financial management, auditing, and reporting capabilities. Climate change resilience or adaptation funds will support projects that are effectively designed and can be effectively managed. While capacity for project and financial management for grant funding is inherently similar to the skills and systems required for improving own source revenues, intergovernmental transfers, and PPPs, municipalities in sub-Saharan Africa will also need to understand donors' regulations, compliance systems, and reporting frameworks.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Currently, a number of projects and initiatives couple funding and technical assistance for urban resilience. Some of these are accessible to municipalities in sub-Saharan Africa, while others can serve as examples for future funds that can be dedicated to supporting climate resilience projects throughout the continent. These are described below:

Green Climate Fund (GCF)

The GCF is currently the largest multilateral climate fund, with more than \$10 billion in funding. Nine accredited entities in sub-Saharan Africa can assist with applying for funds: three multilateral organizations (Africa Finance Corporation, AfDB, West African Development Bank) and six national ministries or organizations based in Senegal, South Africa, Namibia, Ethiopia, Rwanda, and Kenya. Thus far, the GCF has funded 28 projects in Africa addressing a mix of mitigation and adaptation efforts. Two established programs assist with proposal preparation: the GCF Readiness Programme and GCF readiness grants. The GCF Readiness Programme is a joint UNDP/United Nations Environment Programme/World Resources Institute initiative that is working to improve countries' capacity to access and manage GCF funding, including support in sub-Saharan Africa for Kenya, Ghana, and Benin. The GCF readiness grant program was established under the GCF to provide small grants to countries to assist with proposal preparation. To date, 17 sub-Saharan African countries have received grant funding¹. While the GCF is not exclusively focused on urban resilience, the fund has noted this as a priority area and already has a number of projects running, including the \$87 million Senegal Integrated Urban Flood Management Project, the \$405 million Fiji Urban Water Supply and Waste Management Project, and the \$80 million Climate-Resilient Infrastructure Mainstreaming in Bangladesh project (GCF 2018).

Rockefeller Foundation's 100 Resilient Cities

The 100 Resilient Cities initiative provides technical support to develop and implement a resilience strategy and serves as a peer-learning network. To date, the initiative has leveraged more than \$655 million from national, philanthropic, and private sources to implement resilience projects. At this point, the city selection process is closed to new entries, however 100 Resilient Cities currently works with nine sub-Saharan African cities, including Accra, Addis Ababa, Cape Town, Dakar, Durban, Kigali, Lagos, Nairobi, and Paynesville (100 Resilient Cities 2018).

C40 Cities Finance Facility

The Finance Facility is a program under C40 that provides support to cities to develop and implement climate change projects, particularly those involving infrastructure. The facility provides proposal preparation support and capacity building to city administrators, and serves as a peer support network. At the moment it has only funded two pilot projects in Bogota and Mexico City, but 10 sub-Saharan African cities are part of the C40 network: Accra, Addis Ababa, Cape Town, Dakar, Dar es Salaam, Durban, Johannesburg, Lagos, Nairobi, and Tshwane (C40 2018).

ICLEI's Transformative Actions Program (TAP)

TAP is an initiative focused on catalyzing and improving capital flows to cities, towns, and regions and strengthening municipal capacity to access climate finance and attract investment. This is primarily achieved through proposal preparation support and capacity building at the municipal level. It currently has seven projects in cities in four sub-Saharan African countries (Cameroon, Nigeria, Senegal, and South Africa).

¹Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Djibouti, Ethiopia, Gabon, The Gambia, Mali, Mauritania, Mauritius, Namibia, Rwanda, Senegal, South Africa, Togo, Zambia.




The Asian Development Bank's (ADB) Urban Financing Partnership Facility

While the facility only provides support for ADB member countries, it serves as a promising model for donors to replicate in other regions. The facility consists of two trust funds: the Urban Environmental Infrastructure Fund and the Urban Climate Change Resilience Trust Fund for Asian countries. Through these funds, the ADB: provides capacity building for city officials in conducting prefeasibility assessments, project structuring, and project implementation; provides early-stage investment or viability gap financing; and serves as a guarantor to help cities borrow from domestic markets and stimulate long-term investment.

USAID's Resilient Cities Asia (RCA) project

Similar to ADB's initiative, RCA could serve as a model for future projects in sub-Saharan Africa. RCA is seeking to support secondary cities in Asia to become more resilient to a wide range of climatic impacts by providing technical assistance to increase cities' access to financing, leverage private sector investment, and develop better resilience projects that attract investors.

ILLUSTRATIVE INTERVENTIONS

-  **Planning for climate resilience funded projects:** Train municipal stakeholders to assess climate resilience needs and define infrastructure projects with clear cost considerations. Facilitate municipal planning processes with strategic advisory services and organized workshops to strengthen planning systems and align municipal plans with climate resilience project needs.
-  **Preparing competitive proposals:** Train municipal stakeholders to assess climate funding options, proposal requirements, and project selection criteria. Organize workshops and provide direct technical assistance in the proposal preparation process. Ensure beneficiaries understand how to link climate resilience project goals and objectives to selected interventions, implementation and management plans, monitoring and evaluation systems, and contractual compliance and reporting frameworks and systems.
-  **Project management:** Strengthen municipal capacity in project management lifecycle. Provide advisory services to assess organizational and human resource structures and create clear lines of reporting and defined roles and responsibilities of project management staff. Strengthen financial management capabilities and integrate project financial management systems into municipal public financial management accordingly.

2. CLIMATE CHANGE TRUST, REVOLVING, AND MUNICIPAL DEVELOPMENT FUNDS

Trust funds are defined by their legal, governance, and financial structures, their resource mobilization strategy, and their chosen method for issuing grants (UNDP 2016). Trust funds in developing countries typically are initially capitalized by development banks or international donors, and often require a number

of years to establish to ensure proper financial management and safeguard procedures are in place. To date, no municipalities in developing countries have established a climate change trust fund. However, a number of countries – including South Africa, Indonesia, Bangladesh, and Tonga – have established green funds or climate change trust funds at the national level. The Green Fund in South Africa is a particularly relevant example, due both to its location in the region and its support to municipalities. It has provided funding to eThekweni Municipality (Durban) and the City of Tshwane to implement carbon sequestration and energy efficiency projects, respectively, as well as to a number of private companies and local nongovernmental organizations (Green Fund 2018).

Outside of climate change trust funds, a small number of developing countries are addressing climate resilience needs through revolving funds, particularly focused on the water sector. While common in cities in the United States and Europe, water revolving funds have been difficult to establish in developing countries due to challenges such as large percentages of nonrevenue water (losses through illegal connections, leaks, or failures in billing), lack of financial management and transparency, and lack of in-house technical expertise to establish the funds.

Sovereign wealth funds, although not explicitly climate funds, are an option for financing climate resilience programs in cities throughout sub-Saharan Africa. Thirteen African countries – including Angola, Botswana, Gabon, Ghana, Mauritania, and Nigeria in sub-Saharan Africa – have sovereign wealth funds that could be used to fund municipal infrastructure and resilience projects. Established under Nigeria's Sovereign Wealth Fund, the Nigeria Infrastructure Fund serves as an example, and focuses entirely on domestic investment in infrastructure, with an in-house team that identifies investments, conducts project preparation, and recommends projects to the board.

Municipal development funds operated by national or state government entities are another resource that can be used to support municipal financing needs for climate resilience projects. Capital for municipal development funds is often provided by private lenders, the central government, and donor agencies. Operationally, agencies managing the municipal development funds issue loans to subnational governments to finance capital investment programs; the terms of the loan can depend on a municipality's capacity to repay the loan. As a result, concessional lending is an important mechanism for ensuring the funds are accessible to municipalities with limited capacity in public financial management and revenue collection.

Several challenges may impede the successful development of the funds and the ability of municipalities in sub-Saharan Africa to leverage these resources for climate resilience projects. First, launching trust, revolving, and municipal development funds requires significant upfront capital. Mobilizing this capital can be a lengthy and challenging process, particularly as donors and the private sector face competing interests. Related, municipalities may lack the capacity and legal, policy, and regulatory frameworks to successfully create, institutionalize, and transparently manage municipal development funds. Second, municipalities will require capacity to prepare clear project proposals with accurate costs, risk analysis, and sound designs. This capacity is important for both developing projects for municipal development funds and proposals for revolving or trust funds. Third, municipalities may require training to manage leveraged funds and project implementation within the regulations, procurement, and reporting requirements of the funding institution.

Financial management of the project is especially important if the municipality is expected to repay a loan. When relevant, municipalities could consider repayment of loans through direct interest payments, partial or full transfer of revenues, or cross-subsidization of the loan through municipal or national taxes. As a result, technical assistance programs should focus on supporting municipalities to understand the proposal development process, project lifecycle, and regulations of the funding agency. Fourth, and perhaps most important, technical assistance programs should support municipalities to design projects that can be sustained beyond the life of the funded project.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Other than the Water Finance Facility detailed below, no development organizations or banks are currently running trust fund development and support programs in sub-Saharan Africa. However, there are a number of relevant examples globally. Below are examples of revolving funds from Kenya, the Philippines, Peru, and India, and examples of municipal development funds from Colombia and Bangladesh.

Water Finance Facility (WFF)

The WFF was established to mobilize private investment from domestic investors (e.g., pension funds, insurance companies) by issuing local currency bonds in the capital market to support water and sanitation service delivery. These bonds provide long-term loans to public or private water utilities that have little or no access to commercial finance or that have access at unfavorable terms. The first fund initiated by the WFF is the Kenya Pooled Water Fund (KPWF), with support of the Netherlands Embassy in Nairobi, the Kenyan National Treasury, the Ministry of Water and Irrigation, the Water Sector Trust Fund, USAID, Sida (Swedish International Development and Cooperation Agency), and SNV (Netherlands Development Organisation). The Kenyan National Water Finance Facility expects the first pooled bond (approximately KSh 3.5 billion or \$35 million for six water services providers) to be issued by the second quarter of 2018, which will allow services to be extended to an additional 700,000 people (WFF 2017).

Philippines Water Revolving Fund (PWRF)

Launched in 2008 with the support of USAID, Japan International Cooperation Agency, the Development Bank of the Philippines, and other partners, the PWRF used USAID's Development Credit Authority (DCA) to provide partial loan and bond guarantees to encourage private investment in the water sector. In 2010 for example, a DCA-backed, \$2.6 million private loan leveraged \$10 million in public financing under the PWRF for water rehabilitation in the Puerto Princesa City Water District, which improved water delivery for more than 165,000 people. As of 2014, the PWRF has channeled more than \$234 million in loans for water and sanitation projects to finance 21 water and sanitation projects, of which approximately 60 percent came from private banks (World Bank 2016).

Servicio de Agua Potable y Alcantarillado de Lima (SEDAPAL)

SEDEPAL (Lima Drinking Water and Sewerage Service in English) developed a water revolving fund using approximately 5 percent of the water fees it collects from users. The fund supports two activity streams: one percent of the total water tariff (approximately PEN 70 million or \$23 million annually) to fund

green infrastructure initiatives; and 3.8 percent (approximately PEN 266 million or \$89 million annually) to fund climate resilience and disaster risk reduction activities. Examples of projects funded include improved livestock management for farmers on the periphery of the city, rainwater infiltration projects, and restoration of amunas, or traditional water storage systems (Zwick 2015).

Tamil Nadu Water and Sanitation Pooled Fund (WSPF)

The WSPF was created by the Tamil Nadu state government in India to address the decreasing number of state government guarantees available for infrastructure project financing. The fund focused on water and sanitation projects in small- to medium-sized towns and combined a pooled bond with a DCA-backed credit guarantee, which allowed the fund to leverage a \$1.1 million reserve and a \$500,000 credit guarantee to finance \$5 million in water projects (World Bank 2015).


Findeter Fund

In Colombia, the Findeter Fund used external borrowing to rediscount loans made by private commercial banks to public local authorities and local private entities for investing in urban services and utilities. The success of a model like Findeter depends on the depth of the local financial markets and the availability of capable financial institutions that can take on credit risk related to municipal and urban services loans on a substantial scale (UNCDF 2016).

Bangladesh Municipal Development Fund

In 2004, the Government of Bangladesh received technical and financial assistance from multilateral institutions to set up the Bangladesh Municipal Development Fund. The fund is financed by loans from development partners to the Government of Bangladesh. The fund, in turn, issues loans to municipalities based on project proposals. Over the course of a decade, 154 municipalities received funding for infrastructure projects, driven by demand from municipalities. The fund attaches conditions to the loans, including increased revenues through municipal taxes, which has resulted in increased tax revenues of 17.5 percent (UNCDF 2016).

ILLUSTRATIVE INTERVENTIONS

 **Proposal development:** Train municipal stakeholders to research, identify, and select appropriate climate fund options. Organize workshops to train key stakeholders in the proposal development process, including understanding proposal requirements, project selection criteria, and submission processes. Organize workshops and provide direct technical assistance in drafting the proposal, completing proposal reviews, and ensuring beneficiaries understand how to link climate resilience project goals and objectives to selected interventions, implementation and management plans, monitoring and evaluation systems, and contractual compliance and reporting frameworks and systems.

➡ **Project management:** Strengthen municipal capacity in project management lifecycle. Provide advisory services to assess organizational and human resource structures and create clear lines of reporting and defined roles and responsibilities of project management staff. Strengthen financial management capabilities and integrate project financial management systems into municipal public financial management accordingly.

➡ **Organizing municipal development funds:** Organize study tours to cities with successful municipal development funds. Deliver trainings, capacity building, and institutional strengthening for municipal development fund management. Create clear guidelines for municipal development fund proposals, including submission process, evaluation methodology, award criteria, contract management, and financial oversight. Build institutional autonomy to protect municipal development fund management from political interference. Assess legal, policy, and regulatory frameworks and facilitate reform processes as required. Organize awareness campaigns to secure sustainable sources of capital financing for the fund startup and create plan for continued financing. Pilot municipal development fund proposal process.



10+ YEARS

Long-Term Finance Options

FINANCE MECHANISMS TO PRIORITIZE IN THE LONG-TERM

1. **Bonds** (sovereign, municipal, green, infrastructure, diaspora, social impact and/or catastrophe)
2. **Loans and lines of credit**
3. **Insurance**

Developing a robust functioning capital market is a long-term goal for most sub-Saharan African cities, but one that could be accomplished by building on work done on short- and medium-term interventions to improve revenue collection, strengthen financial management, and increase transparency. Establishing a capital market that allows a municipality to issue bonds or take on debt to finance its own projects rather than relying solely on national or international funding is key to the functioning of cities in developed countries. Interventions aimed at addressing deficiencies in these areas (or in many cases the lack of a domestic capital market) would likely take extensive investment in one municipality, with multiple projects focused on several technical areas.

To the left is a list of mechanisms covered in this section, followed by detailed summaries of the mechanisms, available support programs/initiatives and illustrative interventions to improve their effectiveness in funding climate resilience initiatives.

1. BONDS

Successful issuance of municipal bonds requires development, packaging, and marketing of a product that is attractive to potential investors in terms of balancing financial risk with financial return. Investors seek assurance that they will be repaid in full and according to the terms of the bond. They want to see one or more revenue streams that will allow the municipality to repay the debt. Municipal bonds are nearly always issued to fund capital investment in infrastructure; either that infrastructure must itself generate revenue sufficient to repay the bond debt or other revenue sources like municipal taxes must be designated as a bond repayment revenue source.

In developed countries, bonds are one of the primary means used by cities to finance large capital investments such as climate-proofing infrastructure. Currently, limited capacity exists to issue municipal bonds in sub-Saharan Africa. In fact, only South Africa, Nigeria, and Cameroon have floated subnational bonds at the state, provincial, or municipal level. This is in line with the developing world more generally, in which only 15 developing countries out of 134 worldwide have experience in issuing bonds subnationally (UNCDF 2016). In sub-Saharan Africa, the only country with a Standard and Poor's (S&P) credit rating over BBB (considered 'investment grade') is Botswana, and the only country with a rating higher than BB is South Africa. The rest of the countries either have credit ratings that are low speculative grade or are unrated. At the municipal level, the only cities with credit ratings (through Moody's) are in South Africa, and only

the cities of Johannesburg, Cape Town, Tshwane, and Ekurhuleni have successfully issued municipal bonds. In 2016, Dakar attempted to issue a municipal bond after three years of preparation, but the municipality was ultimately unsuccessful. In fact, only four percent of the 500 largest cities in developing countries are deemed creditworthy in international debt markets, and 20 percent in local markets (World Bank 2013).

The viability of municipal bonds in sub-Saharan Africa should be carefully analyzed before being considered an option for financing climate resilience for services and infrastructure. One benchmark that can help assess whether a municipal bond is a viable option is the national government's prior experience issuing bonds, as this can be a good indicator about where sufficient interest and capacity in domestic capital markets exist. Issuing municipal bonds can be a complicated process. To successfully issue a bond, a municipality will require a capital improvement plan, feasibility studies, and involvement of key stakeholders, such as an underwriter and legal and financial advisors. Municipal bonds also require clear transaction terms, financial information, clearly delineated rights and obligations of investors and issuers, credit ratings, and sale or placement of the bond.

While Least Developed Countries have limited experience issuing subnational bonds, they do have demonstrated experience issuing government bonds in local currency on domestic capital markets. Within sub-Saharan Africa, these include, among others, Angola, Benin, Burundi, Chad, Guinea, Guinea-Bissau, Madagascar, Mozambique, Niger, Rwanda, Senegal, Tanzania, Togo, and Zambia (UNCDF 2016). Technical assistance programs supporting the preparation and issuance of municipal bonds in sub-Saharan Africa should account for local context and build upon existing capacity and experience where possible.

In addition to traditional municipal bonds, resilience projects and sub-Saharan African countries are tapping into innovative bonds to either specifically fund resilience work or to secure bonds with funds other than tax receipts or revenue.

Green bonds

These use the same financial mechanisms as traditional municipal bonds, and therefore municipalities in sub-Saharan Africa will face the same constraints when trying to issue a green bond. However, green bonds remain promising because they allow municipalities to raise finance specifically for low-carbon, climate-resilience, or adaptation-related infrastructure projects. Green bonds are also growing in prominence, with two certification efforts (Climate Bonds Standard [Climate Bonds Initiative], Green Bond Principles [Capital Markets Association]) underway, and more than \$155 billion in green bonds issued in 2017 (Climate Bonds Initiative 2018). While the majority of green bonds are issued in the United States and Europe, other countries in the developing world such as India and Mexico have entered the market, and countries such as Fiji and Nigeria have issued sovereign green bonds. Sub-sovereign green bonds also accounted for approximately 20 percent of the total green bonds market in 2017, and while that again was largely in the United States and other developed countries, the City of Cape Town issued the first sub-sovereign green bond in sub-Saharan Africa in 2017, for a value of \$76 million.

Infrastructure bonds

These can either be tax-exempt and used to fund public infrastructure projects (a municipal bond) or issued by the private sector with the purpose of financing infrastructure projects in the public's interest.

Kenya provides a relevant model for both types of infrastructure bonds: Since 2009, Kenya has issued three infrastructure bonds with a total value of more than \$1 billion, and private or state-owned companies such as the electricity utility KenGen and mobile phone company Safaricom have issued private infrastructure bonds. According to the AfDB, Kenya's success with infrastructure bonds can be partially attributed to three factors: holders can use the bonds as collateral to acquire bank loans; interest on the bonds was made tax-exempt; and a portion of the bonds was made Sharia-compliant to allow investors that adhere to Islamic banking rules to participate (Brixiova et al. 2011).

Diaspora bonds

These bonds leverage the savings of a country's overseas population and offer an investment opportunity that contributes to the development of their home country, in lieu of sending remittances. It is estimated that sub-Saharan African countries could leverage up to \$5–10 billion per year through diaspora bonds (NEPAD 2014). Ethiopia pioneered the use of diaspora bonds in Africa, specifically focusing on financing infrastructure projects. Its first effort, the Millennium Corporate Bond, aimed at raising capital for the state-owned Ethiopian Electric Power Corporation, met with mixed results. The Renaissance Dam Bond corrected issues from the Millennium Bond and has thus far raised more than \$56 million in capital for a multibillion dollar dam project (Brixiova et al. 2011; Xinhuanet 2018).

Social impact bonds

Also known as a Development Impact Bond in developing countries, social impact bonds are used to pay for better social outcomes in certain areas (e.g. improved employment, better health outcomes), and then pass on the savings achieved to investors. Repayment and return on investment are contingent on achieving the specified social outcome. Social impact bonds are a relatively new concept, and as of 2018, there were a total of 108 contracted bonds, with only six of those in low- or middle-income countries. However, of those six, five are in sub-Saharan Africa (DRC, Kenya, Nigeria, Mali, Uganda) and numerous foundations and donors are supporting efforts, including the Conrad N. Hilton Foundation, the Children's Investment Fund Foundation, USAID, the World Bank Group, and DFID (Gustafsson-Wright and Boggild-Jones 2018).

Catastrophe bonds

These bonds are typically issued by a government or insurer through a special purpose vehicle to facilitate the transaction. Investors receive interest payments during the term of the bond, and if no disaster occurs, repayment of the principal is made. The purpose of the bond for governments is to act as a hedge against climate risks and to provide a large injection of cash in the event a disaster does occur (e.g., flooding, wind damage, storm surge). There is a multi-billion dollar catastrophe bond market in developed countries, and numerous donors are working in developing countries (most notably the World Bank). In sub-Saharan Africa, the African Risk Capacity has launched the Extreme Climate Facility, which is a \$1 billion multi-year private capital funding mechanism that will issue climate change catastrophe bonds to participating countries beginning in 2018 (ARC 2018a).

Technical assistance programs can help municipalities in sub-Saharan Africa prepare and issue bonds in several ways. First, municipalities can reduce the debt risk associated with a bond by issuing bonds in local currency. This is particularly important if local currencies experience rapid fluctuations against more stable

currencies such as the U.S. dollar. Second, technical assistance providers should build local capacity for preparing and issuing municipal bonds to ensure a smooth and a transparent process. Capacity in public financial management over the project implementation is equally important if the municipality is going to repay debt obligations to municipal bond holders. Third, technical assistance providers can support the viability of municipal bonds for climate resilience projects in sub-Saharan Africa by raising the profile of the municipal bond. Specifically, donors can support the development of a robust local credit rating market and finance credit rating evaluations on behalf of the municipality to obtain an independent assessment of their financial marketability. This will help facilitate greater awareness about municipal bonds within domestic markets.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

At the moment, municipal bonds remain a stretch goal, although a number of initiatives exist to provide support for sovereign and sub-sovereign bonds.

City Creditworthiness Academy

A joint World Bank/C40 Cities Climate Leadership Group/Private Public Investment Advisory Facility (PPIAF) initiative, the academy aims to improve the capacity of city authorities to work toward achieving the investment-grade credit ratings that would allow them to borrow on domestic financial markets or potentially issue municipal bonds.

Green Cornerstone Bond Fund

IFC, together with the asset management company Amundi, launched this \$2 billion green bond fund dedicated to emerging markets in 2017. The fund buys green bonds from local institutions, with the aim to encourage more local financial institutions to issue green bonds, thereby increasing global demand and building local markets. The fund also provides green bond capacity strengthening by providing training and sharing international best practices (IFC 2017).




Africa Financial Sector Deepening Fund

Launched in 2018 by the AfDB, this fund aims to stimulate the local bond market by supporting local financial institutions, supporting local bond issuances as anchor investors, and improving the climate for local investment. The fund aims to raise \$200 million and invest over ten years in the following priority countries: Botswana, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Mauritius, Namibia, Rwanda, Tanzania, Uganda, and Zambia (AfDB 2018a).

African Local Currency Bond Fund

Founded in 2012 by KfW, the German Development Bank, this fund seeks to support non-sovereign entities in the issuance of bonds and other debt instruments in local markets. The fund both serves as an anchor investor and runs a technical assistance facility that provides technical assistance to local issuers, credit rating support, SMART certification and deal specific support (ALCBF 2017).

ILLUSTRATIVE INTERVENTIONS

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Understanding green bonds: Organize trainings and workshops for municipal stakeholders in the basics and types of municipal bonds, including green bonds. Supplement financial risk analysis trainings with capacity building and institutional strengthening for public financial management.
- 
Preparing for municipal bonds: Organize workshops with municipal stakeholders to plan for municipal bonds. Embed technical advisors within municipal departments to provide advisory services over the project design, strategic plan, implementation plan, and financial risk and cost analysis.
- 
Marketing bonds: Create wholesale marketing strategy by engaging local media, organizing awareness campaigns, and launching online presence. Subsidize credit rating assessments on behalf of the municipality to increase bond credibility and investor interest.

2. LOANS AND LINES OF CREDIT

Similar to bond issuance, the vast majority of cities in sub-Saharan Africa lack the creditworthiness to access loans and other debt instruments from private lenders, and loans require a stable and functioning financial market. Otherwise, they are typically both expensive and difficult to access. In addition to the financial requirements, sound project design and feasibility assessments are needed to satisfy a bank's rigorous due diligence process aimed at assessing the risks and returns of a loan (UNEP 2016). Loan guaranties and loans from development banks could help address this issue. At the moment, the AfDB does not loan directly to municipalities; however, it does use its private sector instruments (loans, guarantees, and equity) to support private investments in power supply, water supply, sanitation, and other urban services. Other loan guarantors such as the World Bank or USAID's DCA work primarily at the national level; however, they have done work at the subnational and municipal level, on both public and private investment projects. More innovative products (e.g., green credit lines) are slowly becoming available, but are currently primarily focused on mitigation efforts, and typically involve lending to commercial banks. For example, the Climate Investment Fund and AfDB provided a line of credit to seven commercial banks in Nigeria to fund private renewable energy and energy efficiency projects, and the AfDB provided a line of credit to three commercial banks in South Africa to encourage private sector involvement in renewable energy and energy efficiency initiatives.

Local credit markets are highly dependent on a municipality's credit history. Technical assistance programs can support municipalities to access loans by strengthening local regulatory and financial systems and leveraging donor financial support to guarantee the loans. Prior to preparing the project for the loan application, technical assistance providers should build the capacity of municipalities to prepare creditworthy projects with clear costs and revenue forecasts. Municipalities will require assistance to improve fiscal discipline, monitoring systems, and macroeconomic stability to cover operating and capital expenditures and to ensure repayment of debts. Municipalities will need to demonstrate strong capacity to manage the project and repay the loan within agreed-upon time periods. A partial or full donor guarantee

of the principal and interest will help instill confidence in local credit providers if concerns arise that the borrowing municipality might default on repayment of the loan.

Technical assistance providers should also consider pairing technical assistance to municipalities with support to the local or national banking sector. By delivering training to local credit providers, technical assistance providers can strengthen a financial institution's long-term involvement in local credit markets. Creditors, however, may be deterred from issuing loans and lines of credit to municipalities if legal frameworks deter or prevent municipalities from incurring debt through loan-based financing or if municipalities are forced to operate within budget constraints set by the central government. As a result, technical assistance providers should involve the national government, such as finance ministries, to clarify and, where possible, reform frameworks to allow for greater flexibility and autonomy at the municipal level. Stakeholder engagement dialogues and a reform process predicated on clear benchmarks can help facilitate this process and yield a vibrant local credit market in which municipalities can access financing for climate resilience of infrastructure and credit providers can benefit from the opening of new market opportunities.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Three primary local guarantors in sub-Saharan Africa are:

USAID's Development Credit Authority (DCA)

DCA primarily works to mobilize finance for small- and medium-sized enterprises (SMEs). Since 1999, it has guaranteed nearly 250,000 loans worth \$1.8 billion. While the focus is on SMEs, in Africa DCA has a particular focus on strengthening the flow of private capital for infrastructure and renewable energy production. For example, in 2016 DCA partnered with Power Africa to issue a \$60 million guarantee to Standard Chartered Bank to cover lending to ZESCO, an electric utility in Zambia, to fund improvements and increased access to the electrical grid (USAID 2016a).




World Bank's Guarantees Program

The program provides project- and policy-based guarantees. Project-based guarantees are particularly relevant in that they assist governments in attracting private investment for specific projects, often related to power or gas development. Despite that focus, guarantees have been provided to renewable energy projects (in Argentina and Zambia) and for a mass transit project between Kenya and Uganda. As of 2015, 34 guarantees have mobilized \$12.6 billion in commercial financing and \$18.6 billion in public financing (World Bank 2018b).

African Development Bank Guarantees

The AfDB provides two guarantees through the African Development Fund to help borrowers obtain financing from third-party lenders: a partial credit guarantee and a partial risk guarantee. The credit guarantee assists countries and state-owned enterprises access commercial financing, and the risk guarantee insulates private lenders against political risks related to the failure of a government or a government-related entity to honor specific commitments (AfDB 2018).

ILLUSTRATIVE INTERVENTIONS

-  **Engage the banking sector:** Organize workshops between municipal stakeholders and representatives from local and national banks in municipal credit and lending. Conduct a perception survey of municipal and financial institution representatives and evaluate opportunities for small-scale, low-risk pilot lending opportunities.
-  **Policy, institutional, legal, and regulatory strengthening:** Assess policy, institutional, legal, and regulatory environments vis-à-vis municipal borrowing and lines of credit. Assess opportunities and barriers to reform, organize workshops to address the assessment findings, and prepare strategic plans for reform. Provide ongoing capacity building to strengthen institutional environments to create more effective and efficient services, improve public financial management, and reduce financial risks with municipal lending.
-  **Project planning:** Provide technical assistance for municipal planning to assess climate resilience project requirements in grey and green infrastructure. Define potential projects with cost analysis and financial risk analysis. Assess borrowing opportunities in local, regional, or national markets. Provide technical assistance to organize project presentations and proposals to lending institutions.

3. INSURANCE

The insurance markets in many of the rapidly developing countries in sub-Saharan Africa are developing and provide a number of options for municipalities and individuals, although those options tend to be limited to more basic insurance products such as property, health, and liability insurance, and penetration rates tend to be very low. South Africa has the largest market, and accounts for almost 80 percent of all premiums in sub-Saharan Africa (Aglionby 2016). The more innovative approaches to providing insurance in developing countries – including micro-insurance, parametric insurance, catastrophe insurance, project insurance, and weather index-based insurance – tend to be donor-funded or donor-guaranteed, and focused on pilot projects or pilot countries. To date, virtually all work in this area has been at the country level, and focused on the agriculture sector, or on providing insurance for natural disasters.

Insurance is a tool that can support lending and municipal bonds for climate resilience through whole or partial protection against default by insuring the debt. In exchange for insurance on the debt, the borrower (municipality) will make regular premium payments to the insurer. Often, the insurance will be limited to specific instances, such as a natural disaster that prevents payment on the debt. Insurance can protect lenders based on underwriting and potentially incurred losses. One risk with insurance programs, however, is that providers or policyholders can cancel policies with notice.

SUPPORT PROGRAMS AND RELEVANT EXAMPLES

Below is a summary of work done in this area in sub-Saharan Africa, as well as an example of a national catastrophic insurance program from Mexico and two examples of regional pooled insurance in the Pacific and the Caribbean.

USAID Index Insurance Pilots

USAID has done work with Senegalese farmers through the World Food Programme's R4 Rural Resilience Initiative and in southern Ethiopia on the research, design, and outreach of an index insurance product to make it possible for nomadic herders to protect themselves against the loss of livestock from severe droughts.

World Bank's Global Index Insurance Facility (GIIF)

The GIIF is a multidonor trust fund supporting the development and growth of local markets for weather and disaster index-based insurance. The facility has covered more than 600,000 farmers, pastoralists, and micro-entrepreneurs worldwide, with \$119 million in property insured. In sub-Saharan Africa, it covers farmers in eight countries (Benin, Burkina Faso, Kenya, Mali, Mozambique, Rwanda, Senegal, and Tanzania) by funding intermediary private sector "brokers" who develop index insurance products with local and regional insurance companies who then sell the products. The facility also provides legal and regulatory assistance to countries to improve the enabling environment for insurance markets (World Bank 2014).

ACRE Africa

ACRE is the largest example of a private company working in the development space; it covers more than one million farmers in Kenya, Rwanda, and Tanzania with crop, livestock, and index insurance products. ACRE is also one of the brokers funded by the GIIF. ACRE is not an insurance company, however; it acts as an insurance agent to link farmers with local insurers and other stakeholders in the agricultural insurance value chain, and is involved in risk assessment, product development, and risk monitoring (ACRE 2017).

African Risk Capacity (ARC)

ARC was established by the African Union (AU) with donor support to help AU member states improve their capacities to plan and prepare for and respond to extreme weather events and natural disasters, with a specific focus on food security for vulnerable populations. ARC is composed of two parts: the Specialized Agency, which provides oversight, capacity building, and monitoring and evaluation; and ARC Insurance Company Ltd., which carries out commercial insurance functions of risk pooling and risk transfer for its parametric weather insurance product. ARC currently provides coverage in Burkina Faso, Mali, Mauritania, Niger, Senegal, and The Gambia (ARC 2018).

Blue Marble Microinsurance

Started in 2016, Blue Marble is a microinsurance venture incubator funded by 10 major private insurance companies². It is currently in the pilot phase of an agricultural index insurance product in Zimbabwe, but will be seeking to expand support of entrepreneurs through idea generation, and pilot and scale-up funding.

Mexican Natural Disasters Fund (FONDEN)

FONDEN (through the FONDEN Program for Reconstruction) is a national-level fund that combines a catastrophe bond that provides a fast payout for relief and recovery with indemnity insurance that

² American International Group Inc., Aspen Insurance Holdings Ltd., Guy Carpenter & Co. LLC, Marsh & McLennan Cos. Inc., Hamilton Insurance Group Ltd., Old Mutual plc, Transatlantic Reinsurance Co., XL Catlin, and Zurich Insurance Group.

secures funding for reconstruction of public assets. The fund provides protection against earthquakes and hurricanes, and prioritizes the protection of local and national infrastructure, low-income housing, and certain natural environment assets. FONDEN is funded through the federal expenditure budget, and has been historically allocated an average of \$800 million per year (World Bank 2012).




Caribbean Catastrophe Risk Insurance Facility (CCRIF)

Formed in 2007, CCRIF was the first multi-country risk pool in the world. It serves as a regional catastrophe fund for Caribbean governments. The parametric insurance mechanism helps limit the financial impact of hurricanes and earthquakes by providing rapid cash payouts to mitigate the short-term cash flow problems small developing economies often face. CCRIF was developed by the World Bank and the Government of Japan, and was capitalized through contributions by a number of donors, as well as through membership fees paid by participating governments. Since its inception, the facility has made 36 payouts to 13 member governments on their policies, totaling more than \$130 million (CCRIF 2017).

Pacific Catastrophe Risk Insurance Company (PCRIC)

Similar to CCRIF, PCRIC was established in June 2016 after the termination of a pilot insurance program from 2013 to 2015 under the World Bank-funded Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). PCRIC is managed by Willis New Zealand, and offers member countries parametric insurance designed to pay out within 10 days after a triggering event, providing a quick injection of cash after a natural disaster. PCRIC currently offers \$45 million in protection for five countries in the Pacific: the Cook Islands, Republic of the Marshall Islands, Samoa, Tonga, and Vanuatu (Gallin 2017).

ILLUSTRATIVE INTERVENTIONS

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Climate change insurance indices: Deliver technical assistance to assess risks of climate change on municipal infrastructure in the short, medium, and long term. Identify data gaps and improve methodologies, data management, and analysis systems to improve assessment of climate change risks. Work with government agencies, municipal governments, and insurance companies to create data-driven index-based insurance policies for climate risk to municipal infrastructure.
- 
Strengthen literacy of climate resilience insurance: Organize workshops with municipal stakeholders to raise awareness about climate resilience insurance. Deliver trainings to municipal staff to strengthen literacy and understanding of local, regional, national, and international insurance markets. Create opportunities for facilitated presentations by insurance agencies about climate resilience insurance, including requirements, responsibilities, and processes for securing insurance plans.
- 
Market analysis for insurance companies: Organize workshops with local insurance companies to raise awareness about climate resilience risks and market opportunities for insurance companies. Complete analysis of climate resilience risks to municipalities and present market-based pathways for involvement of insurance companies. Deliver technical assistance to create reference guides and best practices tailored to local contexts.

CONCLUSION

While specific funds exist for climate change mitigation, resilience and adaptation projects, city leaders, international donors, philanthropic organizations, private companies, city residents, and other stakeholders need to shift their thinking on climate resilience from one-off projects driven from the outside to viewing resilience as an ongoing, recurring expense. Current infrastructure will need to be climate-proofed, and new infrastructure will need to take climate change into account, often requiring additional measures to be taken to ensure that the lifetime of infrastructure is maximized.

To operationalize this shift in thinking, city officials and other stakeholders will need to include climate change in their policies and regulations, incorporate climate change considerations in their planning and design, and account for the costs of building climate resilience in their budgets. Much like standard infrastructure development or municipal service delivery, funds for resilience must come from a mix of regular funding sources, including municipal revenue generation, intergovernmental transfers, risk-sharing partnerships, local resilience or adaptation funds, and eventually issuance of debt on a domestic capital market.

Ultimately, a city with sound management, proper planning, and adequate revenue is more resilient to climate change than a city with poor leadership and inadequate planning and resources. Thus, the goal of any resilience initiative should be to improve the overall functioning of a city, in addition to any resilience objectives.

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U.S. Agency for International Development

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

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