



# Financing Low Carbon and Resilient Cities in Africa

AfDB Sustainable Urban Development  
Action Plan (SUDAP)



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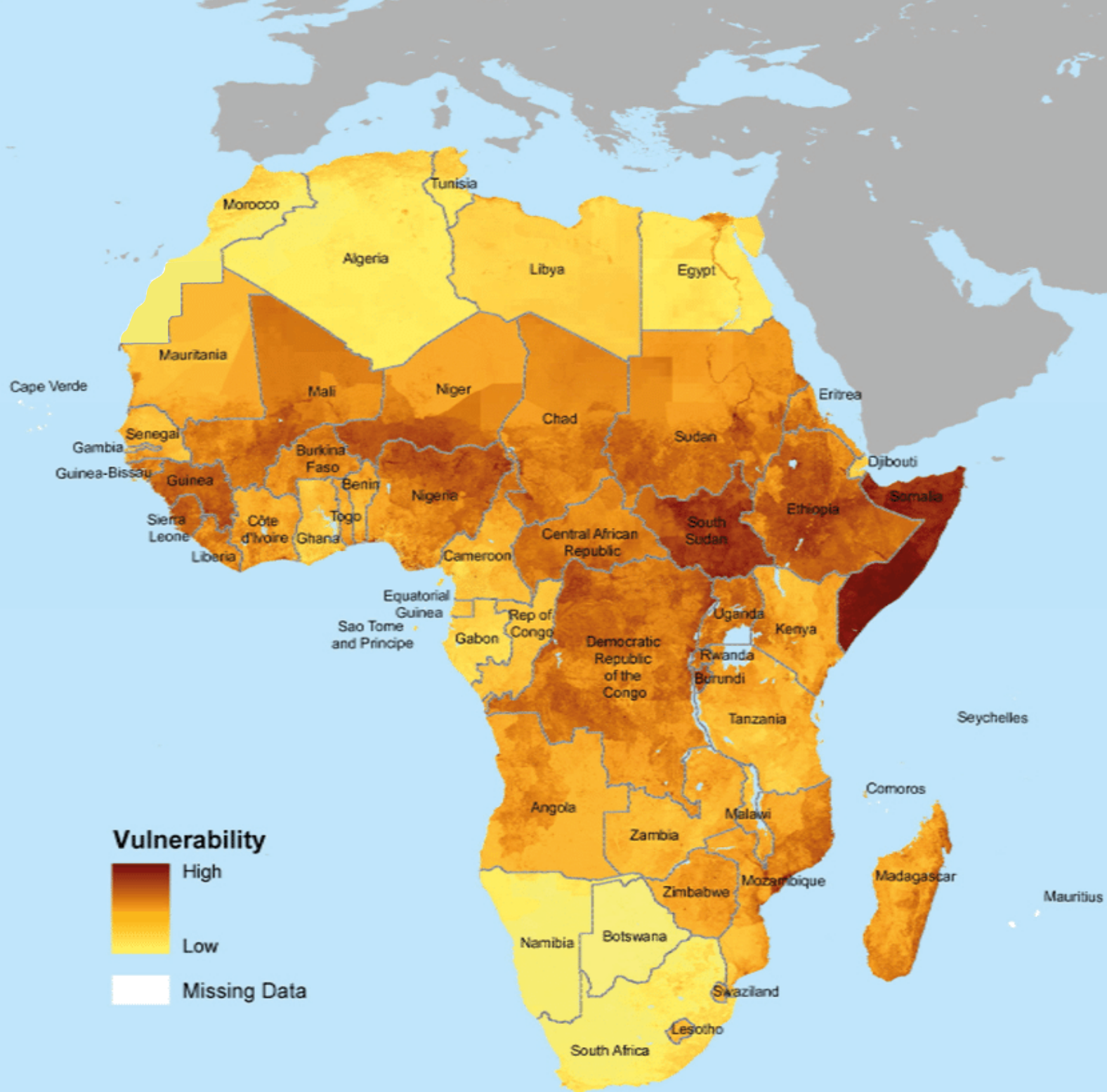
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Climate Change Vulnerability Index 2017 - © Verisk Maplecroft 2016

Source: Climate and Conflict in Africa. Oxford Research Encyclopedia of Climate Science 2019  
[https://www.researchgate.net/figure/Map-of-Composite-Climate-Vulnerability-in-Africa-Combining-Indicators-of-Physical\\_fig2\\_333005004](https://www.researchgate.net/figure/Map-of-Composite-Climate-Vulnerability-in-Africa-Combining-Indicators-of-Physical_fig2_333005004)





Dar es salaam floods aftermath aerial drone images Photo Moiz Husein Storyteller  
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# 1. INTRODUCTION

This paper examines ways of building urban resilience in African cities, particularly in response to natural disasters and the need to adapt to accelerating climate change. The paper describes how African cities are building urban resilience as part of their evolving urban governance and management efforts and investigates whether the resilience philosophy provides a pathway for achieving sustainable development in African cities. The paper concludes with an outline of actions that the African Development Bank (AfDB) can take to strengthen efforts that can be taken by cities to build urban resilience in the face of the on-going climate emergency.

This paper is organized into three sections:

1. Section 1 provides the background and context of urban resilience in Africa's urban governance.
2. Section 2 analyzes the challenges and opportunities for effective intervention.
3. Section 3 discusses the way forward in Africa focusing on recommendation, policy, programme and policy initiatives to be considered by the African Development Bank.

Africa's population is expected to reach 2 billion by 2050 and more than 60% will live in urban areas (United Nations, 2018). While the growth in urban population provides economic opportunities (e.g., an increase in the labour force), it also intensifies the risk of climate related disasters, as vulnerable informal settlements and activities dominate the urban space with growth encroaching unplanned and risky areas. Cities

contribute to and affect global development. Presently, 80 percent of global Gross Domestic Product (GDP)<sup>1</sup> is produced in cities, but cities also produce 75% of energy-related emissions. In Africa, cities already contribute half the GDP, but the trend is towards the global average and thus, given the enormous future sizes of African cities, there is an urgent need to foster their low carbon development – from both the perspective of energy self-sufficiency and from that of the planet.

However, despite this increasing wealth, 70% of city dwellers lack reliable access to at least one core service, like housing, water or electricity (World Resources Institute, 2020). Currently, the frequency and intensity of climate risks are increasing across all regions of Africa. For example, more than 2 000 climate related disasters were recorded in Africa between the 1970s and 2018, with close to half of such disasters happening in the past 10 years (see Statistics by the GFDRR and World Bank 2018: 5). Undeniably, climate change is foundational to these rising climate related disasters. Whereas urban areas in parts of Africa are confronted with severe drought conditions (e.g., East Africa), others are faced with persistent and perennial floods (e.g., West Africa), loss of lives and properties (UN-Habitat, 2014). It is important to underlie that these climate-related events are considerably influenced by human activities such as GHG Emissions, pollution, resource extraction, infrastructure construction and land reclamation altering ecological processes and systems (United Nations International Strategy for Disaster Reduction [UNISDR] 2012).

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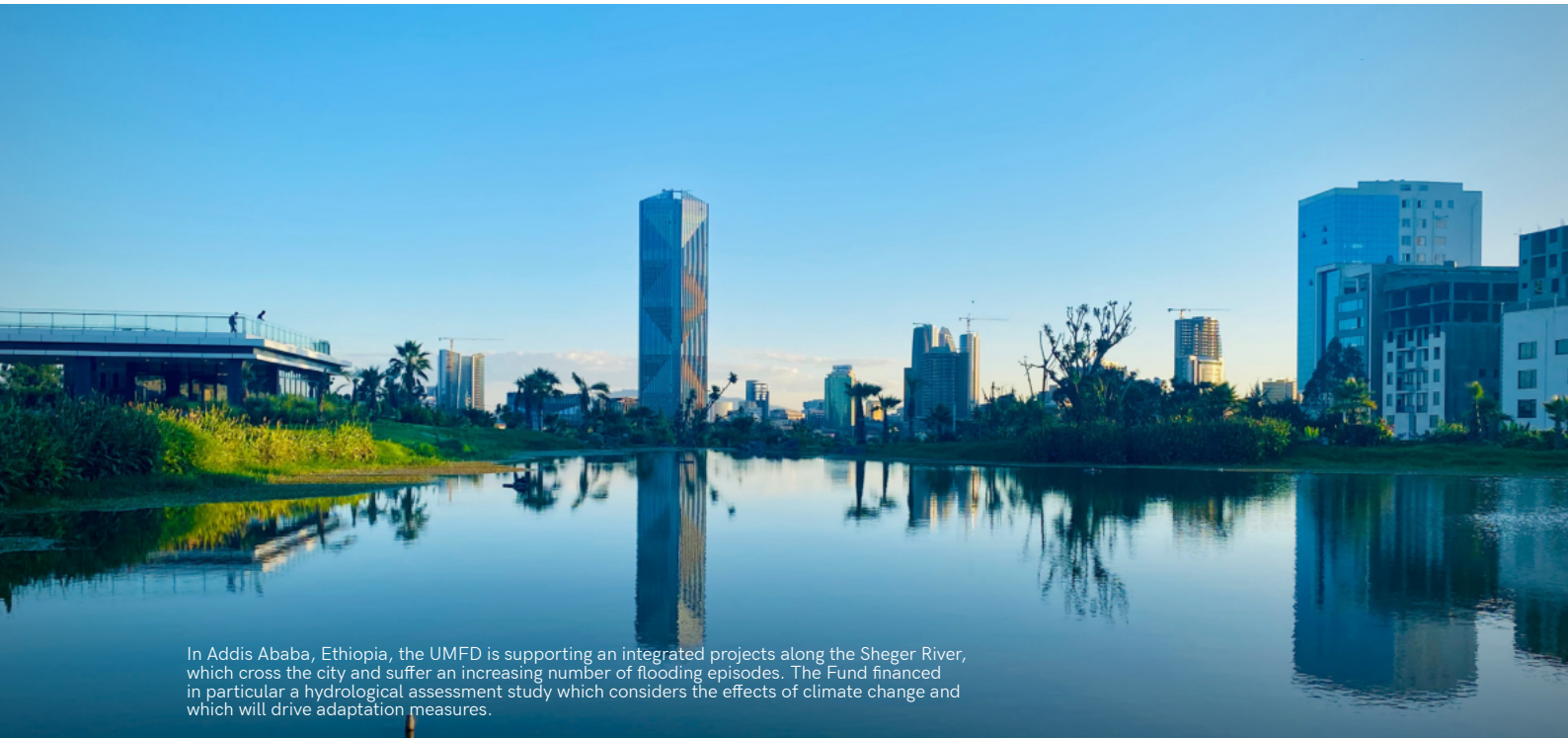
<sup>1</sup> See Saghir, J and Santoro, J. 2018 Urbanization in Sub-Saharan Africa: Meeting Challenges by Bridging Stakeholders 2018. SSA's 143 cities generate a combined \$0.5 trillion, totaling 50 percent of the region's gross domestic product (GDP).

Lacking urgent and appropriate actions, rapid urban growth and climate change will continue to threaten African cities' sustainable development and resilient futures. For example, recent research shows that urban ecological resilience of African cities is under intense stress from climate change and unplanned rapid urban growth (Cobbinah, 2021). Reduction of urban biodiversity, exploitation and depletion of natural resources, pollution, and widespread land use transformations are contributing to increasing regime shifts in ecosystems, often to less desirable and degraded conditions.

In the setting of the Sustainable Development Goals (SDGs), the New Urban Agenda (NUA), the Africa Urban Agenda 2063 (AU agenda 2063), and the Sendai Framework for Disaster Risk Reduction, African countries are acknowledging the urgency and need to build resilient futures, including Ghana, Senegal, South Africa, Zimbabwe, Uganda and Kenya (Cobbinah & Addaney, 2019). For example:

- Countries such as Angola and Mozambique are focusing on designing policies and restructuring urban and local governance institutional capacities to address issues of climate related disaster risk and resilience (Cobbinah, 2021a; Okpala, 2009).
- Similarly, others including Ghana are drawing on the support of different planning instruments and technical and financial strategies from both international and local organizations (e.g., Cities Alliance) to chart a resilient future pathway.

Despite these attempts, building community resilience transcends the act of developing planning initiatives to include trade-offs linked to the cost and benefits of implementing such planning initiatives. As reported by Schipper and Pelling (2006), there are cases of planning initiatives directed towards disaster risk mitigation that have worsened urban vulnerability and risks. This is most often the case with relocation schemes, where livelihoods and social networks are disrupted. For example, in Ethiopia and southern Africa, the distinction between development and humanitarian aid has become blurred, and millions of people face chronic food insecurity even in years of good rainfall (Schipper & Pelling, 2006). Within this context, the quest of urban resilience via planning and development actions, if not properly managed, can generate greater risk accumulation for the vulnerable urban population (Cobbinah, 2021a). Much more practically and locally engaged interventions are needed to minimize risk. This should be part of continuing attempts to deliver resilient futures in a continent highly susceptible to the consequences of climate change and rapid urbanization.



In Addis Ababa, Ethiopia, the UMFDF is supporting an integrated projects along the Sheger River, which cross the city and suffer an increasing number of flooding episodes. The Fund financed in particular a hydrological assessment study which considers the effects of climate change and which will drive adaptation measures.

# 2. THE CHALLENGES AND OPPORTUNITIES FOR EFFECTIVE INTERVENTION

## 2.1. ECOSYSTEMS AND ENVIRONMENTAL PROTECTION IN AFRICAN CITIES

Ecosystems provide as defensive safeguards against natural hazards and augment the resilience of cities through the availability and quality of drinking water, and other places of recreation. Through the process of urban expansion and climate change, African cities have transformed their natural environment producing new risks (White et al., 2017). The urbanization of watersheds coupled with the impacts of climate change continues to modify hydrological processes in many African cities, and destabilizing slopes, and increasing hazards including floods and landslides. Similarly, transformation of urban ecosystems in Africa is impacting on the natural asset base of the cities, including decline in the amount and quality of freshwater available. The combined impacts of climate change and rapid urbanization are affecting the ecosystems of African cities and the volume and value of the services these systems generate. For example, the conversion of wetlands to agriculture or hard surfaces diminishes the value of the water cleansing services that wetlands often provide; and affects the biodiversity of the cities contributing to extinction of some species (White et al., 2017).

The Nakivubo wetland, one of several large wetland systems located in the city of Kampala, is considerably degraded. Polluted water from the city passes through the wetland before entering Inner Murchison Bay (Turpie et al., 2016a). In South Africa, Durban is also confronted with poor environmental management due to two parallel structures that govern land within the eThekweni municipality's boundaries. About 36% of the municipality is managed by the eThekweni Municipal Authority, with 37% under traditional authority administered by the Ingonyama Trust Board, which is under the national-level administration by the Minister for Rural Development and Land Reform (White et al., 2017). While the eThekweni government has developed an ecosystem management and protection programme for green open spaces throughout the city, a large part of this land lies within traditional authority areas, limiting the eThekweni government's authority to administer green open spaces.

There is limited green open space in African cities. The amount of all public parks, recreation areas, greenways, water ways and other protected areas accessible to the public is estimated to be below 1 m<sup>2</sup> per inhabitant in many African cities, such as Luanda (Angola), Cairo and Alexandria (Egypt) (African Green City Index 2010). This is below the 9 and 30 m<sup>2</sup> per capita recommended by the World Health Organization and United Nations, respectively (White et al., 2017). In Addis Ababa (Ethiopia), most of the urban trees



have been cleared for housing purposes and it is estimated that vegetation coverage, including trees in private yards, cover 7,900 ha or just less than 15% of the total city land area (Dubbale et al., 2010). Climate change and rapid urbanization have also been identified as the major cause of the depletion of green space in Kumasi (Ghana), once known as the “Garden City of West Africa” (Mensah 2014). Many of the parks and garden spaces within the city that were once in a good condition have been degraded or encroached, and green open space now covers only 10% of the total land area (Mensah 2014). In South Africa, the Durban Bay estuary has been reduced by about 57% and only 14% of the original tidal flats, 3% of the mangrove forest and 4% of the natural shoreline habitat remain (Environmental Resources Management (ERM) & Marine and Estuarine Research, 2011). Other estuaries in Durban have lost more than 70% of their original fish habitat (Forbes & Demetriades, 2008). Similarly, in Dar es Salaam, thousands of informal dwellings are situated along riverbanks and floodplains of the Msimbazi River system, with densities increasing downstream towards the city centre (Turpie et al., 2016b). While there is provision for a 60m protected River Reserve on either side of all rivers in the city (as outlined in the Environmental Management Act of 2004), this post-dates much of the settlement and has been difficult to enforce. As a result, there are frequent episodes of flooding and loss of human life.

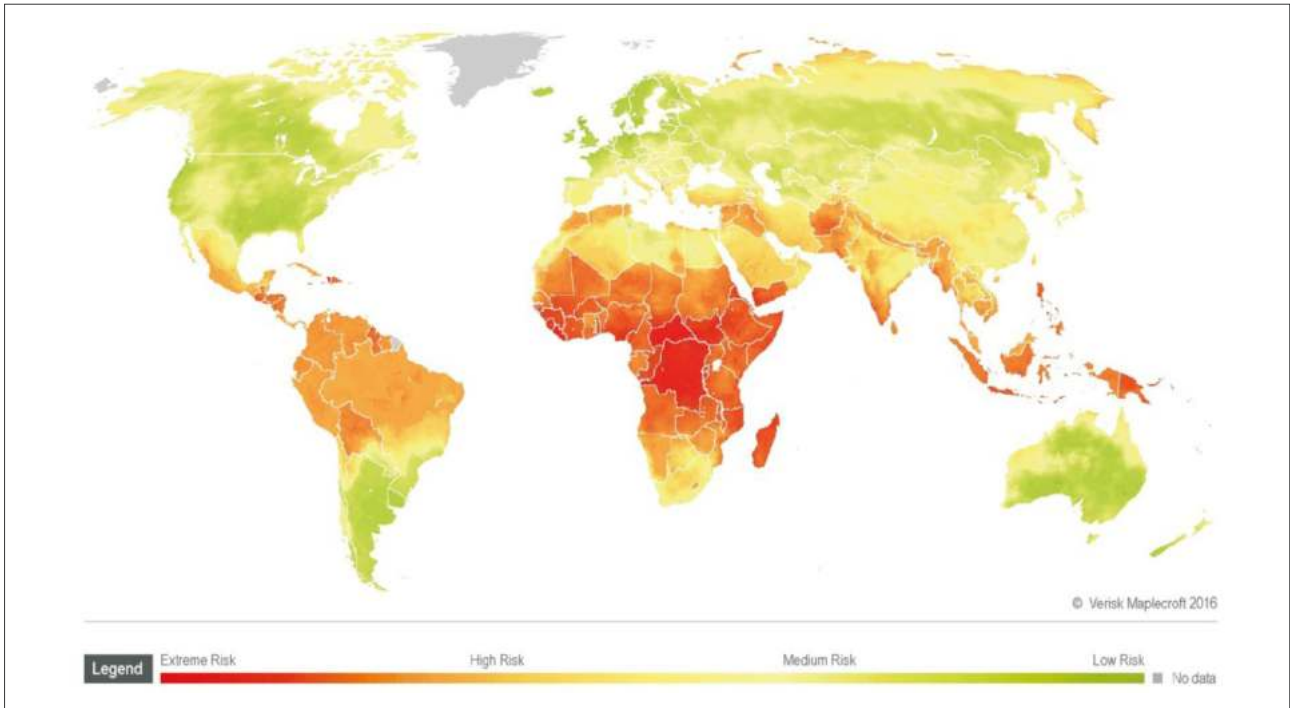
Maintaining a balance between human actions and ecosystems is an excellent strategy for reducing risk and contributing to resilience and sustainability in African cities. However, in the context of lack of an adequate understanding of the natural environment and the extent of urban environmental degradation in Africa, the value of ecosystem services provision is becoming increasingly problematic (White et al., 2017).

National and city governments are unable to make well-informed, land-use, budgetary and investment decisions regarding the development of urban areas and lack the tools to mitigate negative environmental externalities. Moreover, there is a significant risk that African cities may become locked into a “grow dirty now, clean up later” development path which is potentially costly, inefficient and welfare-reducing (World Bank 2012).

## 2.2. CLIMATE CHANGE IMPACTS ON AFRICAN CITIES AND POTENTIAL RESPONSES

According to the Intergovernmental Panel on Climate Change (IPCC), African countries remain the most vulnerable to climate change, yet most poorly prepared to deal with its impacts globally (Niang et al, 2014). More worryingly, Africa’s rapidly growing cities are the most vulnerable worldwide (Dahir, 2018). Africa hosts the majority of the 100 fastest growing global cities characterized as ‘extreme risk’ in the index on climate change vulnerability. Unfortunately, these cities are also experiencing unprecedented urban population growth, comprising 15 capital cities and several key commercial hubs, such as Kampala (Uganda), where the urban population is projected to increase by an average of 5.1% between 2018 and 2035; Dar-es-Salaam (Tanzania) population will increase by 4.8%, Abuja and Lagos (Nigeria) population will rise by 4.5% and 3.5% correspondingly. Addis Ababa (Ethiopia) is experiencing 4.3% increase in population, while Luanda (Angola) is projected to record population growth of 3.7% (Hewston, 2018).

## 2. THE CHALLENGES AND OPPORTUNITIES FOR EFFECTIVE INTERVENTION



Source: <https://earthbound.report/2018/06/28/two-maps-climate-responsibility-and-climate-vulnerability/>



A worker watches as construction machines clear a landslide caused by storms and flooding in the coastal city - Durban, South Africa, 22 May 2022. - Photo Gareth\_Bargate © shutterstocks



# 3. AFRICA'S CITIES AND CLIMATE

## 3.1. GEOSPATIAL DISTRIBUTION BY POPULATION BAND

Although populations are growing so rapidly that information rapidly becomes outdated, current research for AfDB indicates roughly 560 cities of various sizes in Africa, shown below by population band (Greater than 3 million, greater than 1 million, between 500k and 1 million, between 250k and 500k, and 100k to 250k population)<sup>2</sup> :

There are 11 cities with more than 3m population



51 cities with more than 1M population



58 Cities with 500k-1M population



<sup>2</sup>Source: Jexium Ltd. research for AfDB



117 Cities with 250k-500k population

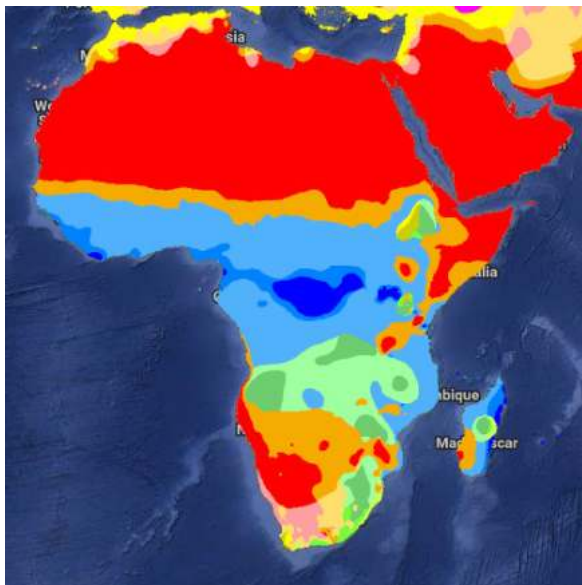


And 350 cities with 100k-250k population



### 3.2. DISTRIBUTION BY CLIMATE ZONES

Africa's climate zones are shown in the following maps based on the color-coded Köppen-Geiger climate zone classification system<sup>3</sup>, explained for each region of Africa below:



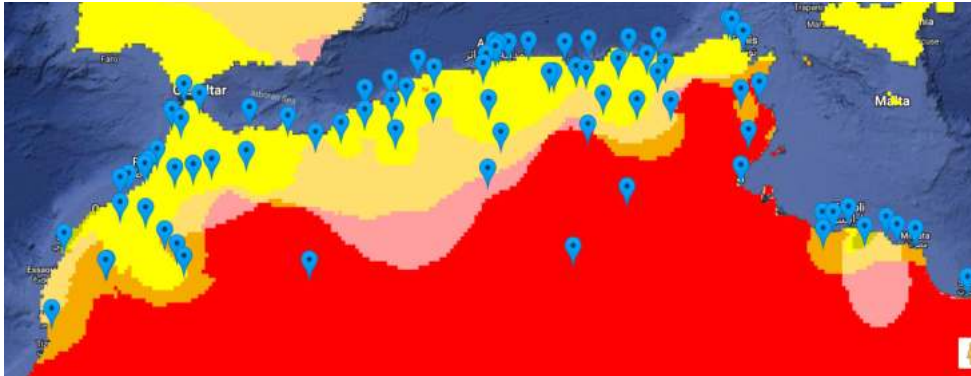
Africa's cities are found in all of the continent's major climate zones, but are clustered in a few key ones,

- “Arid Steppe Hot” (orange) and “Arid Desert Hot” (red) for most cities in North Africa, the Horn of Africa and Southwest Africa;
- “Equatorial savannah with dry winter” (light blue), “Equatorial Monsoon” (medium blue) and “Equatorial rain forest” (dark blue) for most cities in East and Central Africa;
- “Warm temperate, fully humid with warm summers” (bright green) and “Arid steppe cold winter” (yellow) for most cities in Southern Africa;
- “Equatorial savannah with dry winter” for most cities in East Africa; and
- “Warm temperate with dry winter and warm summer” (medium green) for some inland cities in the Nile Valley and Horn of Africa.

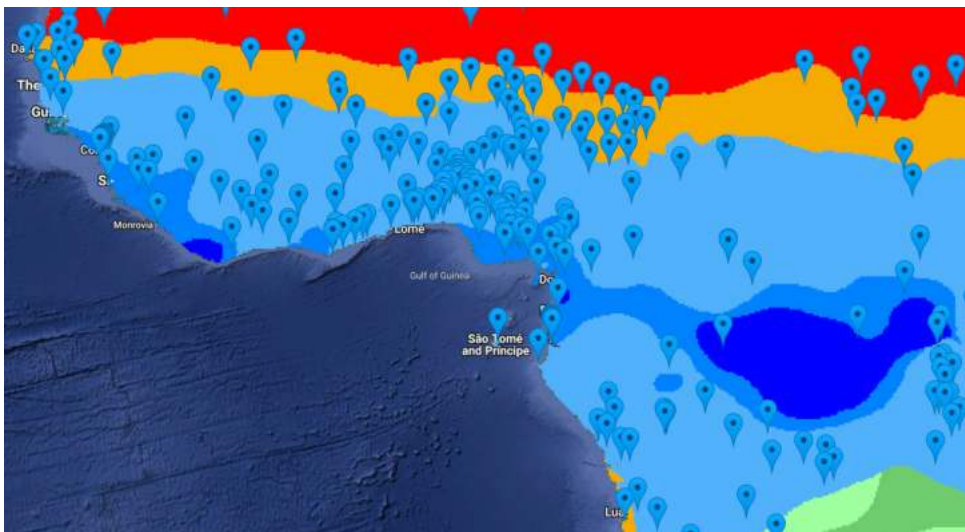
<sup>3</sup> Köppen-Geiger map layer from <https://people.eng.unimelb.edu.au/mpeel/koppen.html> merged with African city data compiled by Jexium Ltd. for AfDB

The following maps show each region in more detail.

North African cities, shown in the below, are largely in the “Arid Steppe Hot” zone (yellow); some cities further inland are in the “Arid Desert Hot” zone (red).



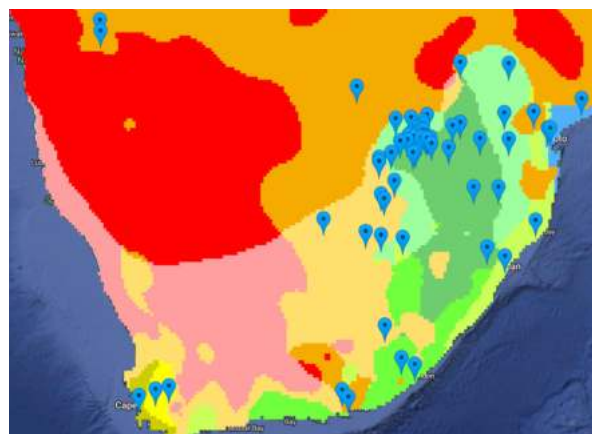
West African cities, below, are largely in the “Equatorial savannah with dry winter” (light blue) and “Equatorial Monsoon” (medium blue) zones; some cities further inland are in the “Equatorial rainforest, fully humid” zone (dark blue).



Central African cities, below, are largely in the “Equatorial savannah with dry winter” zone (light blue); a few cities are in the “Equatorial rainforest, fully humid” zone (dark blue).



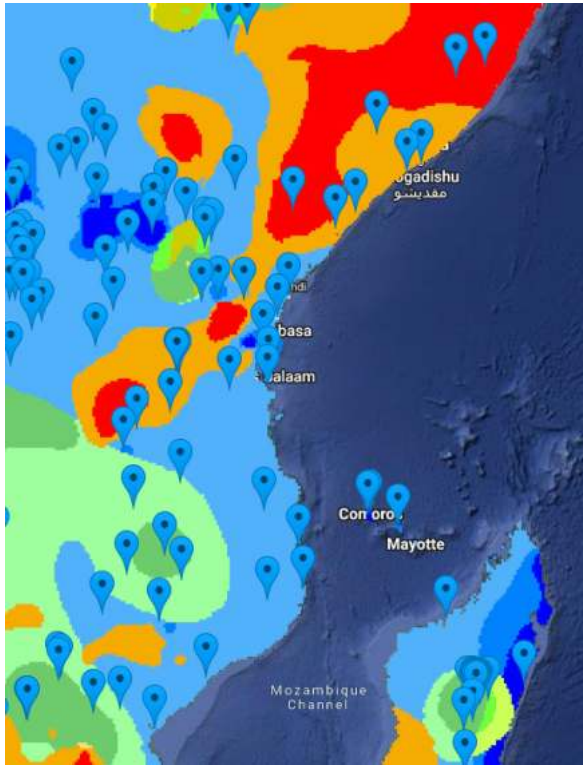
Southern African cities are largely in the “Warm temperate, fully humid with warm summer” zone (bright green), and in the “Arid steppe cold” zone (yellow).



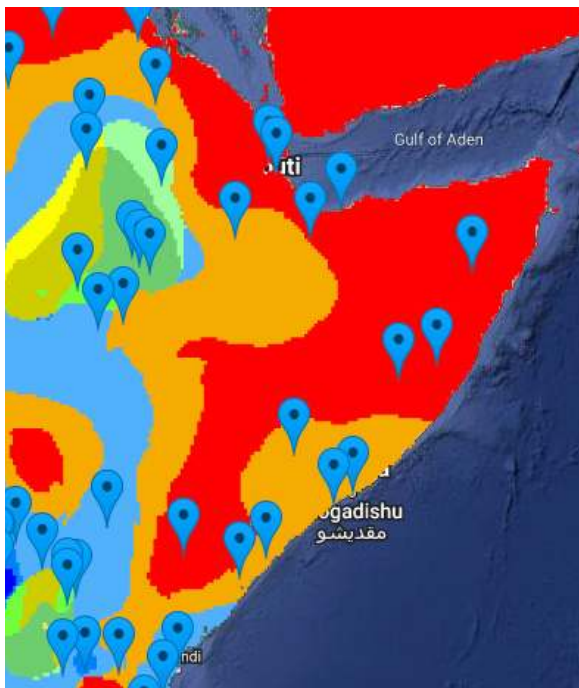


### 3. AFRICA'S CITIES AND CLIMATE

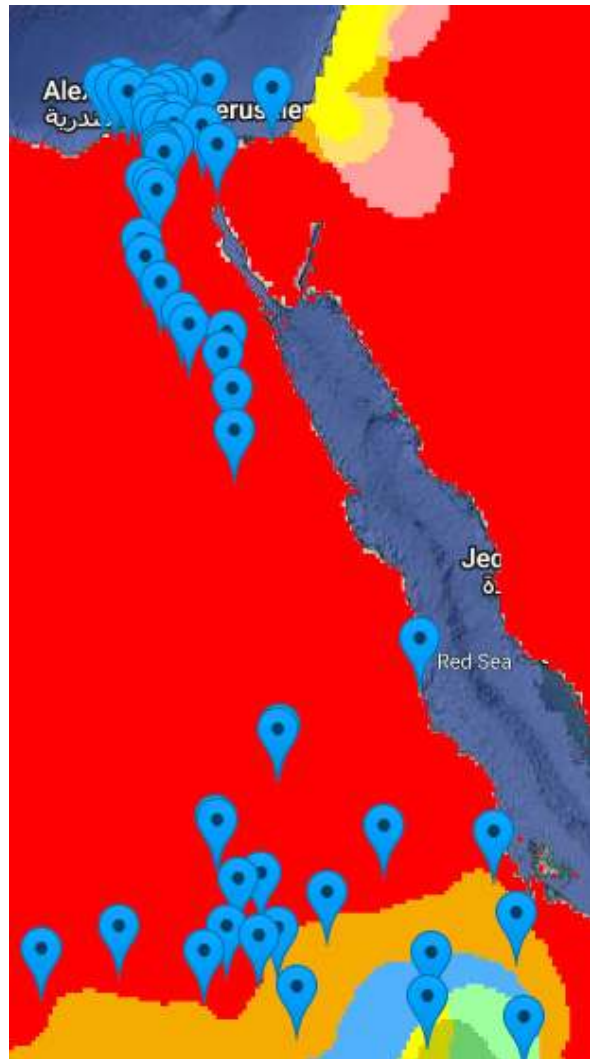
East African cities are largely in the “Equatorial savannah with dry winter” zone (light blue), with some in the “Arid Steppe Hot” zone (orange); some inland cities and Madagascar are in the “Warm temperature with dry winter and hot summer” zone (light green).



Horn of Africa ...



...and Cities in the Nile Valley...



...are largely in the “Arid desert hot” zone (red), with some in the “Arid steppe hot” zone (orange) and a few in the “Warm temperate with dry winter and warm summer” zone (medium green).



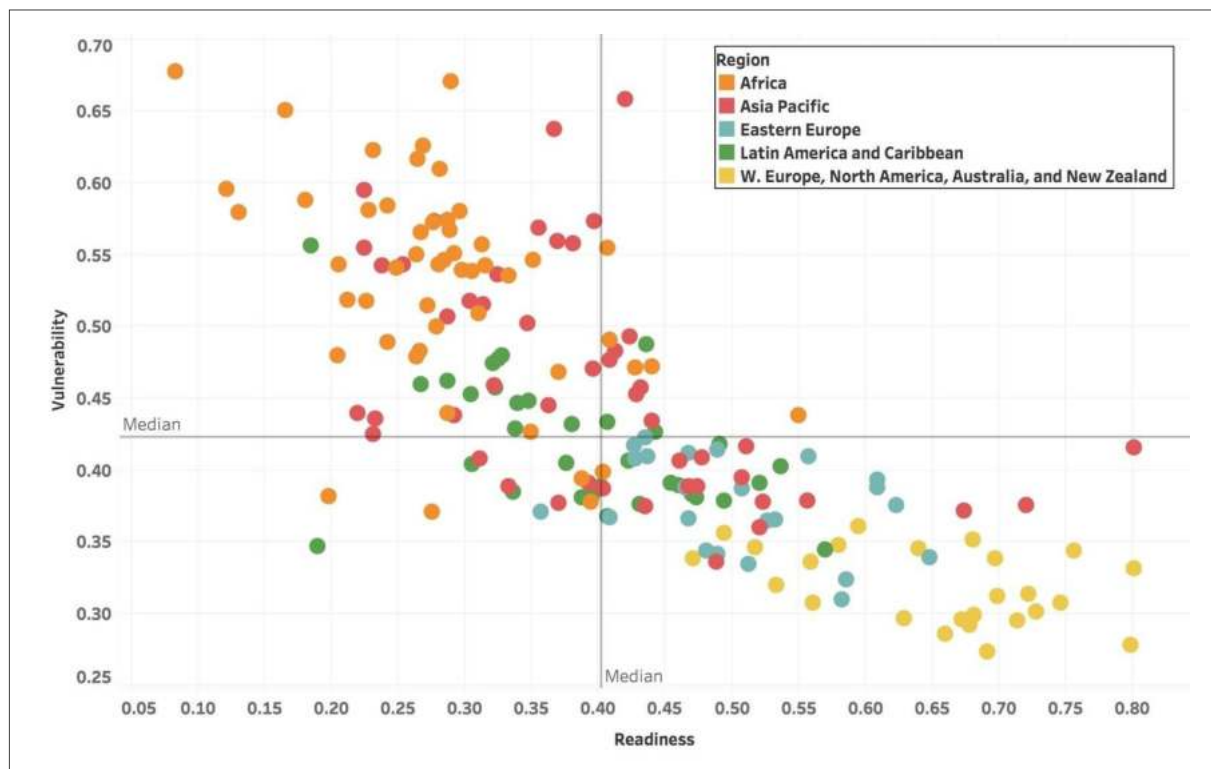
### 3.3. EXPECTED IMPACT OF CLIMATE CHANGE

The climate of each zone is moderated or exacerbated (a) by each city's specific topography – temperatures are lower at higher elevations in each zone, humidity higher for cities on a river or on the coast, and (b) by local variations in temperature and precipitation. In general, however, climate change is forecast to make each zone more extreme in its various dimensions: hot zones will become hotter, arid zones more arid, monsoon zones stormier and wetter, and so on. Urban development must plan for cities to adapt to climate change, and to be more sustainable and resilient.

### 3.4. URBAN GHG EMISSIONS AND MITIGATION

Although Africa is not seen as a large GHG emitter, what emissions there are, are generated to a large part in cities by busses and jeepneys, by factories, by power plants and by buildings.

Since the 1990s, cities in Africa have experienced severe consequences of climate change (Cobbinah & Addaney, 2019), and presently 79 out of the 86 African rapidly expanding cities are confronted with extreme climate change risk (Hewston, 2018). These high-risk cities already encounter everyday struggles to realize their basic infrastructure needs including social amenities and disaster management facilities, with highly vulnerable residents (Simon, 2014). The graph below sets out the assessment prepared by UNHabitat which shows African cities clustering in the quadrant which combines most vulnerability with least readiness. With the present and predicted population and climate change risks, the weight on important services in these cities will only increase. As a consequence of increasing climate and population threats, the call for appropriate intervention to protect this climate-fragile urban space is growing. Given that the sea level rise, warming temperatures, erratic precipitation patterns causing catastrophic flooding and protracted droughts, and threatening rapidly growing populations and investment prospects, building resilience is necessary for Africa's survival.



Source: GCF & UN-Habitat (2019b), based on ND-GAIN data (2019).

Yet, national governments' commitments to implementing urban resilience strategies have not been inspiring despite being signatories to all transnational climate treaties (e.g., the 2016 Paris climate accord, 1995 Kyoto Protocol). Regardless of the widespread climate change impacts and growing vulnerability, urban Africa struggles to build resilience. Capacity constraints of African cities in relation to resources (both logistics and personnel) to ensure the implementation of resilience approaches in order to adequately address and adjust to the emerging challenges remains a major limitation. Consequently, flood events have become more frequent and catastrophic, urban poverty is on the rise (UN-Habitat, 2010), vulnerable population occupation in the urban space (Cobbinah et al., 2015), and unrelenting economic hardship is increasing, creating a difficult and uncertain future. For example, in Dar es Salaam (Tanzania), research indicates that approximately 70% of the residents reside in slums and/or unplanned communities lacking essential services (Jenkins et al., 2014), located in zones (e.g., wetlands) serving as nature reserve and defenses against natural occurrences including flooding.

Notwithstanding Africa's negligible contribution to global climate change (about 4% of the global total in 2017), the continent is faced with increased threat as global emissions are increasing (Dahir, 2018). In 2019, over 3,000 African leaders, the business community and civil-society representatives congregated for Africa Climate Week 2019 to discuss strategies for consolidating multi- and trans-sector approach to addressing climate change. There was consensus among participants on the urgency to bring into line climate change strategies with city level development plans and to guarantee local and global financial support to execute action plans on climate change (Cobbinah, 2021). More investment is needed into resilience building infrastructure, and to achieve this, climate risks need to be more systematically analyzed and considered in city development. This can be supported through an integrated plan financed from the municipal urban development fund. The Africa Climate Week 2019 summit is one of several summits and agreements to which African governments are signatories. Meanwhile, the present state of African cities does not suggest any positives from these public showcasing. At this point, there

is no guarantee that with the needed external funding support, African cities will be able to build climate resilience, without considerable political will and resources, in addition to popular support recognizing the need for climate action prioritization.

To enable this global response particularly in Africa, focused investment in urban resilience strategies will not only enhance urban living but also improve adaptation, minimize climate change related impacts, and support other infrastructure development across growing African conurbations (Cobbinah, 2021b). In fact, investment in city resilience remains an approach for operative and well-organized strategy to managing risks and impacts associated with climate change. The scale of impacts associated with climate change in Africa, and the opportunities presented by climate resilient cities – i.e., developing a capacity for an urban system to contain shocks and stresses generated by climate change while maintaining its functionality by adapting, reorganizing and evolving into an aspired and improved state (Folke, 2006) – require attention.

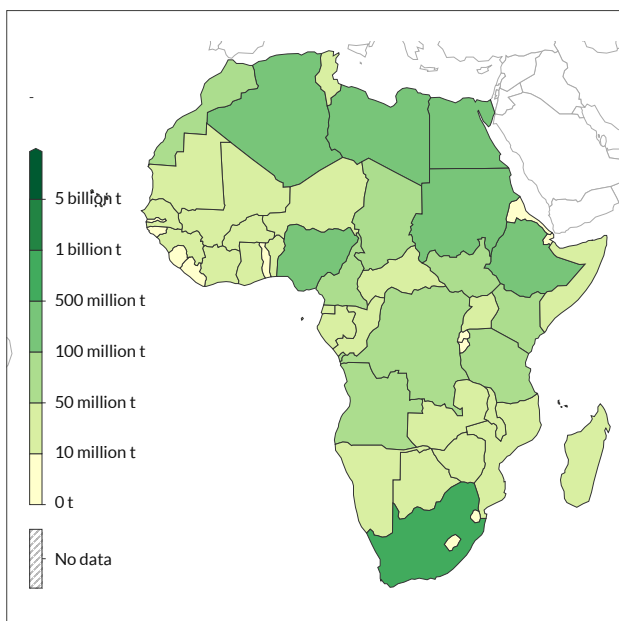
Carbon intensity and potential impact – low carbon development = low pollution and self-sufficiency in development.

## 3.5. AFRICAN GHG EMISSIONS

Africa's CO<sub>2</sub> output per person has been growing fast—much faster than its population. That is to be expected as increases in income and urbanization lead to higher per capita fuel and electric consumption. From 1950 to 2016, Africa's CO<sub>2</sub> emissions increased by a factor of 14. Today, Africa is home to 1.3 billion people; this number is projected to grow to 3 billion by 2060. If CO<sub>2</sub> emissions per capita by that date were merely to rise to the level of India today, Africa's total CO<sub>2</sub> output would quadruple to 5.8 gigatonnes of CO<sub>2</sub> per year—the same level as U.S. emissions today. Put another way, if by 2060 African energy use produces the same emissions level per person as India does today, then even if China, the United States, India, Russia, Japan, and Germany were ALL to cut their CO<sub>2</sub> emissions by 20 percent by 2060, it would not

offset the increases to CO<sub>2</sub> output from Africa. If in forty years, Africa's population as a whole should reach the emissions per capita level of such countries as Egypt (2.5 tonnes per capita per year) or Botswana (3 tonnes) have today, then by 2060 the increase in CO<sub>2</sub> emissions on the continent would be so large as to entirely offset even a 60 percent decrease from today's levels in China.

**Total greenhouse gas emissions, excluding land use and forestry, 2019<sup>4</sup>**



Emissions are measured in carbon dioxide equivalents (CO<sub>2</sub>eq).

The map above shows Africa's non-agricultural GHG emissions by country as of 2018. Countries range from zero to 10 million tonnes CO<sub>2</sub> equivalent of emissions per year (e.g. Gabon and Togo - pale yellow) to up to 500 million to 1 billion tonnes CO<sub>2</sub> equivalent (South Africa - dark green). Most countries have increased their GHG emissions since 1990. Because most non-land use (i.e. non-agricultural) GHG emissions are generated within city administrative boundaries, their mitigation should also be a part of climate-informed urban development. This is true of all emissions whatever their source whether public or private (although these should be subject to potential city pollution controls or other regulations), but especially important with regard to public assets such as city buildings (schools, offices, hospitals, markets), public transportation, and utilities.

Increases in African countries emissions per person to very moderate levels over the coming decades would produce total emissions growth so large as to overwhelm efforts made elsewhere by high-emitting countries to reduce global CO<sub>2</sub> emissions. In other words, Africa's trajectory on energy generation and fossil fuel matters not only to the region's future - because of the low base of current energy use and its rapidly growing and youthful population - but to the entire world<sup>5</sup>. Climate decision-making and investment that does not support mitigation and clean energy transitions on the continent will undercut the world's efforts to achieve Paris targets for global emissions reductions.

A massive rise in CO<sub>2</sub> emissions from Africa, however, cannot be avoided by policies aimed at curbing African population growth or energy consumption. Africa's population growth over the next forty years is a certainty because most of the young women who will enter their reproductive years in that period have already been born and their numbers are huge. Any reasonable reduction in African fertility in the next few decades will only have a moderate impact on population levels in 2060; the difference between the United Nations' "Medium Variant" projection for African population in that year, at 2.97 billion, and the "Low Variant" projection at 2.56 billion is less than 15 percent. Current reductions in fertility in Africa will mainly change projected population after 2060.

Similarly, one cannot expect energy use not to increase with rising incomes in Africa; energy use per person is already so low that even modest increases in income will produce large rises in energy demand. No doubt a voluntary shift to smaller families and energy conservation will be valuable for Africa's long-term future. But for the next forty years, the only way to avoid massive increases in Africa's CO<sub>2</sub> output will be for Africa to avoid a fossil-fuel dependent path of economic development.

As Africa develops it is critical that development be low carbon, in order to support the achievement of the Paris goals and resilient, in order to cope with the adverse climate impacts that have already been "baked in" to our future given existing GHG levels. Both these objectives can be achieved drawing substantively from Africa's rich heritage of indigenous technologies, supplemented with appropriate contemporary technology.

<sup>4</sup> <https://ourworldindata.org/grapher/total-ghg-emissions-excluding-lulfc?region=Africa>

<sup>5</sup> <https://www.wilsoncenter.org/article/battle-earths-climate-will-be-fought-africa>



Appropriate responses have been canvassed, for example in climate change and strategic low-carbon planning in African cities after COVID-19: inclusiveness or chaos? by Xavier Lemaire.<sup>6</sup> He notes that low-carbon solutions exist for modern buildings both in the choice of materials and in the choice of design: concrete or steel which are carbon-intensive could be replaced by equivalent materials generating less carbon emissions but are currently costly to produce. A more effective approach for African cities is likely to use more cheaper, vernacular materials like timber, bamboo, laterite or clay. Using such local materials could reduce the carbon intensity of buildings, create jobs, and help to mitigate climate change, but also contribute to adaptation to climate change as local materials can generate better insulation. Such a strategy would require a change in building regulations, especially in regard to increased flexibility in material choice (to allow for less energy- and GHGG-intensive materials) and decreasing the requirements for low income housing. The latter often involves self-construction on small parcels and policies should encourage the use of materials providing better wall and roof insulation which make a significant difference in terms of thermal comfort. Providing adequate materials or basic structures can also help make low income residences more resistant to extreme weather.

The use of modern approaches to passive housing in tropical areas is still in its infancy, but the design of well-ventilated and shaded open space has existed for centuries without requiring any substantial energy input. Such approaches could minimise the use of air-conditioning. Decentralised renewable energies like thermal solar may help to heat/cool buildings and provide hot water without imposing on the electricity network. Solar photovoltaic electricity is now cheap enough to power houses and contribute to a significant part of the electricity needs of commercial buildings. The recycling of water and collection of rainwater in closed tanks could help to reduce flooding and the consumption of clean water.

In respect of city form, African cities have become increasingly car dependent, even if some African countries are now adopting monthly car-free days. Mass transit relying on high-capacity buses with dedicated lanes—Bus Rapid Transit—has just started to be successfully developed in a few countries with South Africa in the forefront. Africa is lagging far behind Latin America. The development of urban rail systems is gaining traction in major African cities, with several projects under construction. Addressing social inequalities in transport would imply making a clear choice in favour of collective public transport and soft low-cost modes of mobility and away from the supremacy of the car. Low-cost/low-carbon (public transport/electric scooters) transport can go hand-in-hand with encouraging equal access to, and the democratisation of, public space.

Climate adaptation would mean prioritising the reallocation of urban space according to differentiated risk zones. Allocating space for the poor in safe areas stands in contrast to current practice where the socially vulnerable are pushed into physically vulnerable areas where formal sector developers cannot go because of the risk of flooding or landslides. This would mean structuring land markets and development for inclusion.

Acknowledging and accepting informality by giving support to the majority of inhabitants who live in an informal way instead expecting them to imitate a wealthy minority could enhance and make more sustainable existing low-cost/low-carbon ways of inhabiting the city and help to build a low-carbon expansion path for the city. Informality generally implies over-occupation, high density, and narrow streets, which renders external emergency intervention difficult. The absence of proper sewage, the lack of drains, and drains blocked by non-collected waste contribute to an increased likelihood of flooding and diseases in areas located in vulnerable zones. However, residents of informal areas, when provided with appropriate support, can be effectively mobilised to address these issues, increasing resilience to climate change impacts such as coastal erosion, landslides, and floods. The following table shows the range of impacts and responses.

<sup>6</sup> Lemaire, X. (2021), 'Climate change and strategic low-carbon planning in African cities after COVID-19: inclusiveness or chaos?', *Journal of the British Academy*, 9(s9): 39–79. DOI <https://doi.org/10.5871/jba/009s9.039>

## Likely impacts of climate change on informal settlements and possible measures to adapt

PROJECTED CHANGES	EXAMPLES OF LIKELY IMPACTS	IMPLICATIONS FOR RESIDENTS OF INFORMAL SETTLEMENTS AND PEOPLE WORKING IN THE INFORMAL ECONOMY	POSSIBLE MEASURES TO ADAPT
Higher (and increasing) average temperatures, more hot days and heat waves, fewer cold days - over nearly all land areas	Rise in mortality and illness from heat stress in many urban locations. Extended range and activity of some disease vectors – including mosquito and tick-borne diseases. Increased water and energy demand.	Many informal settlements are very dense with very little open/public space and often with uninsulated corrugated iron roofs and poor ventilation that contribute to higher indoor temperatures. Lack of public health measures to control disease vectors. Largest impacts among groups particularly vulnerable – infants and young children, the elderly, expectant mothers, those with certain chronic diseases. Health risks for outdoor workers and informal workers may not benefit from health and safety regulations	Improved building design to maximise natural ventilation; set up locally accessible health services; provide education about measures to reduce transmission of disease and reduce risk of heatstroke/cold exposure. Investing in green space, renaturation and tree planting
More intense precipitation events and riverine floods	Increased flood, landslide, avalanche and mud-slide damage resulting in injury and loss of life, loss of property and damage to infrastructure. Increased flood run-off often brings contamination to water supplies and outbreaks of water-borne diseases	Many informal settlements concentrated on sites most at risk of flooding with poor quality housing less able to withstand flooding and a lack of risk-reducing infrastructure. Homes, possessions and income-generating assets are not covered by any public or private insurance. Transport infrastructure damaged affected workers	Building and infrastructure designs that incorporate flood and landslide resilience; improve drainage infrastructure locally and city flood management practices and systems; innovate to identify suitable disaster insurance products.
Wind storms with higher wind speeds	Structural damage to buildings, power and telephone lines, communication masts and other urban infrastructure	Relatively small increases in wind speeds can damage buildings, particularly as many informal settlements are composed of temporary or semi-temporary housing. Also, informal utility services are likely to be damaged or cut due to extreme wind	Improve housing design and construction to withstand winds; improve construction and design of infrastructure
Increased summer drying over mid-latitude continental interiors and associated risk of drought	Decreased water resource quantity and quality; decreased soil quality and risk of soil erosion; increased risk of forest/bush fire; decreased crop yields and higher food prices	Informal settlement residents usually facing more water constraints and are more vulnerable to food and water price rises	Addressing underlying socio-economic factors which affect poverty; improve water infrastructure and affordability
Intensified droughts and floods associated with El Niño events in many different regions	Decreased agriculture and range-land productivity in drought-prone and flood-prone regions	Impact on food availability and prices in urban areas	Promote rooftop or urban gardening to supplement food sources. Strengthen livelihoods to increase incomes
Sea-level rise	Coastal erosion, land loss, more floods from storm surges; hundreds of millions of urban dwellers living in low elevation coastal zones	Many informal settlements close to the sea with poor quality housing and lacking drainage infrastructure	Raise awareness of storm surges; construct protective infrastructure or explore relocation in a participatory manner

Source: UN-Habitat (2018)

African cities also need protected green spaces and green corridors to act as buffer zones and mitigate the impact of natural events and also to contribute to the well-being of their inhabitants. Green spaces and trees along streets have multiple benefits in terms of climate adaptation: the prevention of landslides and flooding, reduction of heat islands, generation of income, and multiple services (Lwasa et al. 2013; du Toit et al. 2018). It is widely recognised that a healthy city implies a closer contact with nature and moves away from a predatory model to biophilic design and biomimicry (Chatterton 2019: 74–81); but, in most African cities, access to urban green infrastructure, notably for the poor, tends to diminish rapidly (Mensah 2014, Roy et al. 2018, Venter et al. 2020). Designated non-constructible zones do not remain without construction for long if buffer spaces created on paper are not benefiting local communities who then have no interest in protecting those areas.

Conservation areas are one possibility for providing green space, but only if combined with sustainable exploitation of forests, for the extraction of wood, urban agriculture, or recreational use. Environmental management needs to be more integrated (Cilliers et al. 2014, Padgham et al. 2015, Douglas 2018), as in rural areas, where instead of strict conservation areas opposed to development areas, mixed use is now being promoted (Andrade & Rhodes 2012). Boundaries in urban areas should not be used to enforce strictly protected zones, but should favour mixed use with a progressive change of use.

This implies new forms of environmental management where concerns of local communities are part of the solution and not sidelined (Lindley et al. 2018), less short-term thinking where market forces are prevalent, and more long-term planning, as land speculation does not recognise the value of non-built spaces. Giving residents control over their immediate environment, enabling management for and by local communities, and letting local solutions emerge to complement city-wide initiatives through dialogue with local authorities, can significantly reduce the risk of systemic failure of complex cities (Satterthwaite 2011a).

## 3.6. CONSTRAINTS TO BUILDING RESILIENCE IN AFRICAN CITIES

Many African cities struggle to meet even basic infrastructure requirements (e.g., water, energy), so their capacity to address urban resilience needs is a further challenge. Research indicates that prior to the end of the first decade in the 21st century, Africa accounted for over 20 percent of all weather and climate related disasters that occurred globally (UNISDR 2012). Unfortunately, this trend has become more widespread and intense. For example, in the last 30 years, the 10 worst drought disasters in the world occurred in the continent. Flood related mortality is accelerating in Africa despite its reduction globally. Unplanned urbanization and persistent poverty are evident in the proliferation of slums, a major challenge in African cities. However, Africa is starting to show commitment and progress towards increased resilience in its cities, addressing the negative impacts of climate change and rapid urbanization. Strengthened institutions, good governance, better human capital and safe and secure environments with better basic services are essential to guarantee resilience and advance sustainable development, and remain the focus of SDG 11, the NUA and the AU agenda 2063 as well as SUDAP.

Building productive capacity and expanding economic opportunities will play an important role in promoting resilience in African cities (United States Agency for International Development [USAID], 2016). Following a low growth of 2.2 percent in 2016, average GDP rebounded in 2017 reaching 3.6 percent and it was estimated to reach 4.1 percent a year in 2018 and 2019. However, these growth levels are still below the average growth rate of 7 percent needed to achieve the SDGs and the aspirations of AU agenda 2063. The urgency for increased manufacturing through investments in education, skill development, and energy as well as infrastructure development to meet the increasing population demand and the rate of urbanization cannot be overstated. With Africa's urban population expected to triple in the next 50 years, the process of urbanization and population growth presents embedded



potential and risks, which offer invaluable opportunities and challenges. Therefore, the need to strengthen resilience and consolidate sustainable development gains in African cities.

Another hurdle relates to the need to strengthen the role of national institutions in the African resilience building. Planning for resilience and risk reduction in African countries is mostly spearheaded by international organisations but there needs to be increased emphasis on strengthening the role and capacities of national and local city authorities. There is good evidence of success in governance and service provision when there is local ownership of the planning process (see Cobbinah, 2021a). Thus, developing local capacities in urban resilience building must be a key focus for African countries and development partners, particularly for SUDAP and the African Development Bank. Successful institutionalization of urban resilience policies and programmes requires national and local government to establish legitimacy, political commitment and resource dedication.

Therefore, the African Development Bank's strategic investment support should be directed towards consolidating and improving successful institutionalization of urban resilience policies and programmes which have the tendency to deliver sustainable outcomes for African cities.

Compounding the situation further is the growing number of people living in poverty in African cities. Africa's ability to recover and reconstruct from disasters is impeded by poverty, limiting resilience building – a cycle referred to as the disaster risk–poverty nexus (World Bank and GFDRR 2010: 3). The World Bank estimated that the share of African population living in extreme poverty in 2012 was 43 percent, representing an increase of more than 100 million people from 1990 (Beegle et al. 2016). The poor's exposure to risk is exacerbated by inadequate basic services, overcrowded living conditions, substandard housing, inadequate nourishment and poor health (Cobbinah, 2021a). Investment in city resilience competes with other public spending such as health, defense and public debt. National and local governments cannot cover the high cost of disaster mitigation, relief, and reconstruction, and cities continue to accumulate risks, which reinforce their vulnerabilities and limit their resilience.

Building resilient African cities requires adequate critical infrastructure (e.g., water and waste management, nature-based solutions, energy) to improve disaster preparedness, mitigation and adaptation capacities and post-disaster reconstruction. An overall risk reduction strategy should include measures to strengthen weak infrastructure and develop mitigation and adaptation capacities. In the case of Kampala (Uganda), for instance, climate change adaptation measures against flooding include the development and upgrading of drainage systems, culverts/bridges, roads and sewerage networks. Yet, despite long-standing experiences of flash floods, city authorities have failed to develop such critical infrastructure (Lwasa 2010). Within the same context of inadequacy, violent conflicts over control of natural resources and political power – recent cases in Kenya and South Sudan – also affect disaster vulnerability and undermine city authorities' ability to strengthen resilience (USAID 2016), making standardized resilient approaches inadequate. Context-specific resilience policies and strategies should be considered, as processes of risk accumulation and that community perception and responses may differ (UN-Habitat, 2020).

Unfortunately, many African countries are characterized by weak governance regimes. The World Bank and GFDRR (2010) describe Africa's governance landscape as fragmented institutions, inadequate qualified staff, weak enforcement capacity and limited partnerships with key stakeholders. Weak governance means increased risk accumulation, weak adaptive capacities and resilience. In Tanzania, for example, although regulations exist to guide building, zoning and land use, poor enforcement and weak coordination allow development in hazard-prone areas. Across the continent, few countries have legislation to integrate city resilience into broader development planning. There is an opening for the development of a resilient-oriented policy that integrates city resilience in city development plans, and an investment opportunity for the African Development Bank in early warning systems, communication and other critical infrastructure which remain low due to limited local funding and overdependence upon central government.

Of course, governments and legislation alone cannot create resilient cities, which requires participation of different actors. Local communities, who have first-hand experience of the risks, can be important dominant allies in promoting pro-resilient behaviour and better governance. Many resilience initiatives by city authorities in Africa focus on emergency responses to reduce the impacts of disasters instead of broadening to include enforcing strategies for resilience, including coastal protection and water management. Frequently, resilience interventions are an ex-post response to disasters rather than ex-ante strategies for risk reduction (World Bank and GFDRR 2010), a situation attributed to the inflow of humanitarian relief aid during and after disasters. Experiences from the 2011 drought crisis across Ethiopia, Djibouti, Kenya and Somalia suggest that, in spite of early warning predictions of the crisis, local humanitarian responses only occurred after the death of thousands (see Oxfam International and Save the Children 2012). Despite the history of recurring disasters, city management regimes remain disconnected from disaster mitigation and resilience building.

## 3.7 CITY FUNDING AND FINANCE FOR CLIMATE INVESTMENT IN AFRICAN CITIES<sup>7</sup>

### *Fiscal devolution frameworks*

Climate investments in African cities are constrained in relation to their financing by the same forces that constrain all investment in African cities. Weak fiscal devolution frameworks in Africa have resulted in most cities suffering from limited fiscal resources to meet the growing demand for infrastructure and services. Often there is insufficient clarity in the functional as well as revenue assignments of different tiers of government which contributes to inefficient or under provision of services. The separation of spending responsibility for capital and operations and maintenance is another problem that ends

up reducing expenditure on both capital and O&M as each level of government expects the other to replace or renovate assets.

Another issue relates to the fact that fiscal frameworks often lack an effective mechanism to address imbalances in the fiscal capacities of different municipalities. Such imbalances typically manifest as either 'vertical imbalances' referring to the differences between the expenditure mandates and revenue assignments of the different tiers of government or 'horizontal imbalances' referring to the differences between expenditure mandates and revenue generation for same levels of government covering different jurisdictions. An effective fiscal framework will include provision for a fiscal equalisation grant which can balance expenditure requirements for service delivery and the total revenue sources.

Most frameworks are based on inter-governmental transfers (IGTs) to cities and towns, supplemented by own source revenues (OSR) from local taxes and user charges. Inter-Governmental Transfers (IGTs) usually fall into two categories namely: a) general purpose grants that are unconditional transfers where sub-national governments have the freedom to exercise discretion on the use of such funds; b) tied grants that are earmarked for specific purposes determined by higher tiers of government. Unconditional transfers appear to result in better targeted and implemented infrastructure in countries such as Uganda, Tanzania, Ethiopia and Mali. Most central transfers remain formula driven and provide no real incentive for local governments to improve performance or increase revenues. Transfers, or at least a component of them, need to be more focused on improving local government performance in areas such as own revenue mobilisation.

Fiscal decentralisation reforms gained momentum in sub-Saharan Africa in the early 1990s and is most advanced in Ethiopia, Nigeria and South Africa, where spending at the sub-national government level represents about half of total general government spending. Only a handful of other sub-Saharan African countries have significant sub-national government spending<sup>8</sup>, notably Kenya, Rwanda, Tanzania and Uganda,

<sup>7</sup> Governance Paper

<sup>8</sup> Hobdari, N, Nguyen, V, Dell'Erba, S, and Ruggiero, E. (2018). Lessons for Effective Fiscal Decentralization in Sub-Saharan Africa. IMF.

where it amounts to 15-20 percent of central government spending . Francophone countries show lower levels of fiscal devolution, primarily due to the 'principles of the unified treasury' where national Ministries of Finance hold resources that cities collect and then reallocate accordingly. This is intended to keep the duties of authorizing and accounting officers separated, but practically it reduces the expenditure autonomy of local governments<sup>9</sup> .

However, most policy and legal frameworks do not provide for complete and synchronised functional and fiscal devolution. This lack of systematic support results in insufficient efforts on the part of local governments to increase their OSR. Cities need to have new tax rates and revenue sources approved by the regional government, while smaller cities struggle to raise greater taxes and fees on land. As cities are unable to exploit their full OSR potential, they are heavily dependent on IGTs from central and regional government for planning and budgeting purposes over which they have little control. They may be earmarked for specific purposes and/or not delivered on a predictable and regular basis. Lack of clarity on spending assignments also contributes to the inefficient provision or under provision of services, typically seen in the separation between responsibility for maintenance and operation of infrastructure facilities to the subnational governments and the assignment of responsibility for capital investment to the central government. This reduces the expenditures for both maintenance and capital infrastructure, because each level of government can blame the other for not doing its part, and each level expects that the other will ultimately replace or renovate and maintain the infrastructure<sup>10</sup> .

Fiscal decentralisation also requires that they are politically, managerially and/ or technically prepared to use the financial resources provided

to them. If too many functions are decentralised too rapidly and sub-national governments do not have adequate capacity to handle these, they are likely to perform poorly. This is further limited by high staff turnover rates and lack of appropriately qualified and experienced staff, poor administrative capacity, lack of expertise in issues of compliance with national and international regulations and contracting procedures.

In this context, financing climate investments – that typically require higher upfront capital cost even if they save on O&M expenditure in the long run and that may require expenditures across budget categories and levels of government that are currently siloed and/or discrete – is even more difficult.

### ***Potentials for revenue mobilisation and property tax reform***

Estimates put African cities annual financing needs beyond 90 billion US dollars, of which only an estimated 45 billion can be mobilized from domestic sources. Current figures show that a mere 2% of the total domestic revenue mobilized comes from local sources. With such a significant financing gap, local governments need to find new ways to put themselves into a position where they can better use their own resources for development. Improving property tax management is a key part of the process of enhancing municipal revenue mobilisation and strengthening financial accountability. Taxing land and properties allows local authorities and cities to capture revenues that are generated by the onset rapid urbanisation and use it for the public good. Annual taxes on physical property still represent a large source of untapped municipal revenue in developing countries. There are many different types of property tax systems in use<sup>11</sup> which makes the design of support to improvement different in each instance.

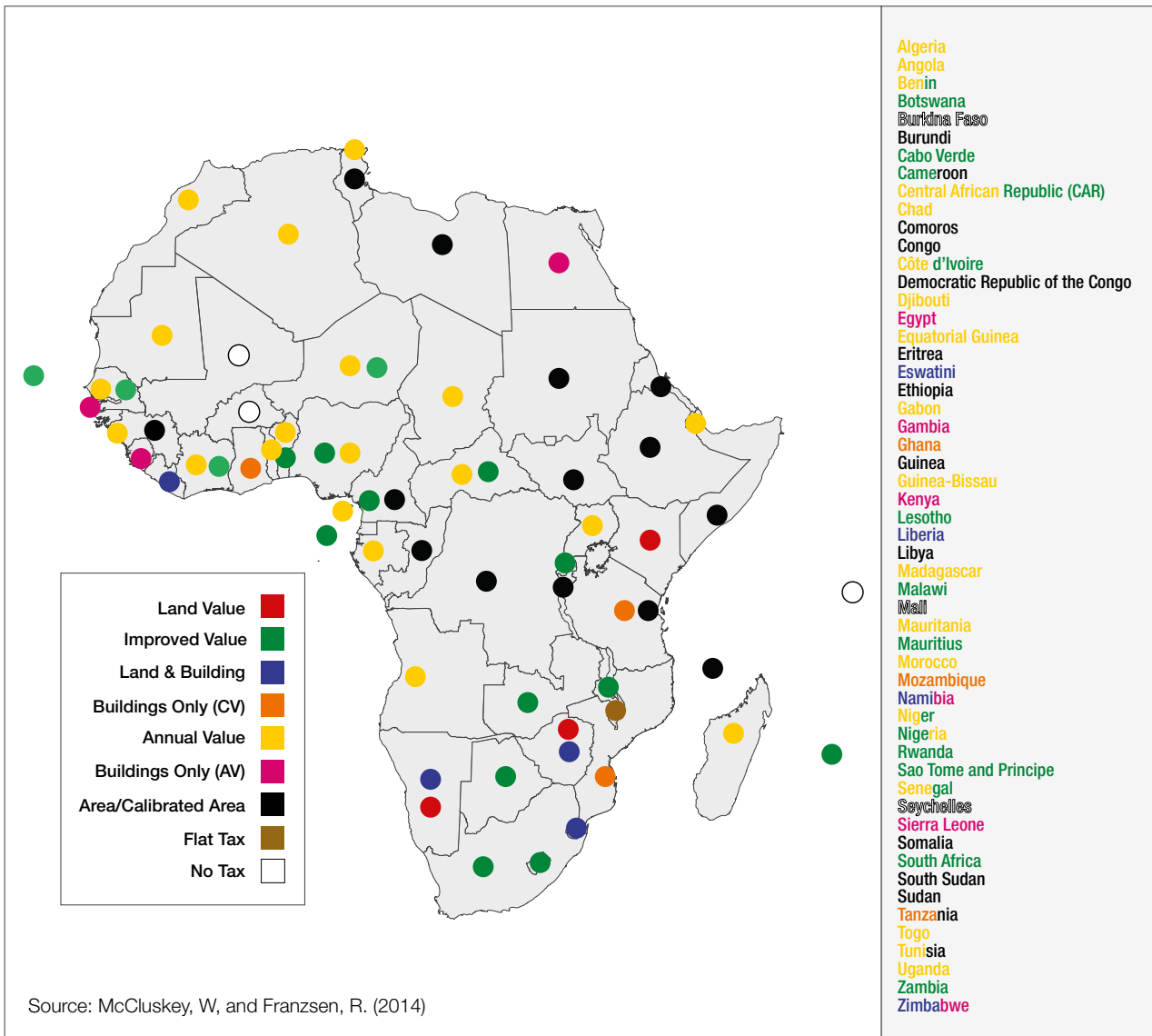
<sup>9</sup> Resnick, D. (2021). The politics of urban governance in sub-Saharan Africa. *Regional and Federal Studies*.

<https://www.tandfonline.com/doi/abs/10.1080/13597566.2020.1774371>

<sup>10</sup> Hobdari, N, Nguyen, V, Dell'Erba, S, and Ruggiero, E. (2018). Lessons for Effective Fiscal Decentralization in Sub-Saharan Africa. IMF.

<sup>11</sup> McCluskey, W, and Franzsen, R. (2014) Presentation on Property Tax Reform in Africa: Challenges and Potential. Conference on Scaling Up Responsible Land Governance. World Bank. Washington.





Most cities in Africa continue to run a manual property tax system based on 3-5 year tax update cycle. In most cases, once the valuation roll has been processed, updates are rarely carried out. Ineffective tax base discovery means that many properties are either are not captured in the register or that changes to the property are not recorded in the register. Such errors and omissions can result in as many as 60% of properties being non assessed or under assessed. More effective tax discovery based on the mapping, identifying and updating of property details could result in significant revenue mobilisation.

Another problem in most cities in Africa relates to the dominant market based system of assessment, often inherited from former colonial regimes. This system uses either capital value or monthly rental value as the base assessment criteria. However, determining market value has been a challenge in most cities where there is a lack of a formal property market where transactions are not recorded. Moreover, there are very few professional valuers to carry out such assessments. Hence, market based assessments tend to reflect outdated and inaccurate values and become complicated to update without empirical data to establish the norm for setting values.

Tax billing and collection is another problematic function in many municipalities. Billing, involves the creation of a legible, formal bill or invoice that is then delivered to the tax payer and the effectiveness of the billing function depends on the medium used to produce the demand notice, the structure of the notice and the mode of delivery. Many systems continue to operate on poorly structured, paper based demand notices issued in triplicate and physical payment. These systems entail the direct handling of money and thus present opportunities for the misuse of funds and corrupt practices. Finally, most urban local governments have weak systems of tax enforcement arising from inefficient identification, processing and follow up of late tax payers and defaulters and the absence of fines, penalties and legal action resulting in poor compliance and high levels of default. In some cases defaults are simply written off after a period of time, in some cases with the collusion of tax officials and no further action is taken.

These issues are particularly problematic from the viewpoint of climate investments, particularly for adaptation. At the most general level, the lack of revenue base limits the level of financing that a city can generate. The low level of fees and taxes mean that potential incentives to green investment given through fee discounts and tax breaks are weak. Property-based fees and taxes are particularly useful to recover costs from the beneficiaries of resilience action and investment which tends to be geographically specific. If they are poorly administered their utility for this purpose is reduced.

### ***Municipal accounting and budgeting***

Municipal budgeting represents a series of steps that link municipal policies and preferences to financial planning and implementation and as such plays a critical role in the overall cost control of a municipality. In practice, most municipalities have adopted incremental line-item budgeting of funds related to establishment (wages and salaries), operations, supplies and equipment linked to the main accounting heads reflected in the Municipal Chart of Accounts. Whilst the budget provides a mechanism to allocate and manage funds spent on salaries, equipment

and supplies it does not provide information on how much is being spent by departments or programmes. In order to determine the costs of service delivery, there would need to be a restructuring of the Chart of Accounts with expenditures re-arranged by function or programme. Whilst the line-item budget helps to allocate monitor and control expenditure under the respective budget heads, it provides little or no information on the achievement of broader municipal policies and objectives nor does it provide financial information on the performance of municipality in terms of infrastructure provision or service delivery. Moreover, the budget timeframe based on an annual rather than multi-year cycle further constraints the reporting on performance, results and outcomes aligned to municipal goals and strategies.

Prevailing municipal accounting systems and practices rarely include provision for the production and/ or updating of a comprehensive asset inventory. In the absence of a well-structured budget and set of accounts, including the annual financial statement and valuation of assets, it is difficult to assess the overall financial health of a municipality. This creates a serious obstacle for generating creditworthiness and undermines the ability of the municipality to leverage finance, either from the private sector or from lending institutions, subject to prevailing regulations on municipal borrowing.

A related problem with municipal budgeting is the lack of accountability. Given the prevailing service delivery pressures on municipalities, there is a lot of emphasis placed on ensuring that budgets are passed in a timely manner with minimum delays. This tends to preclude opportunities for introducing consultative elements into the budget process for fear that wider stakeholder participation and debate will delay the budget approval process which will in turn have serious consequences for council operation and service delivery. Where some elements of consultation have been included in the budget process these are usually programmed at the early stage of budget preparation with inputs from such exercises being gradually diluted as preparation progresses. Mechanisms to monitor the use of funds or evaluate the impact of programs have proven to be generally weak or non-existent.

While climate investment is similarly constrained by these systems, the need to measure impact of such investment adds another layer of complexity. In particular, budgeting systems need to be able to:

- Monitor the expenditure on (and sometimes revenue from) mitigation and adaptation programs and projects;
- Relate such expenditure (and revenue if any) to, and report on, physical progress, GHG impacts and resilience outcomes; and
- Be rigorous, transparent and accountable in order to be able to validate climate outcomes.

Such Monitoring, Reporting and Validation (MRV) systems need integration across budgeting and physical investment systems. Significant support will be needed to put such structures in place.

### ***Financing green investment<sup>12</sup>***

A recent CUT report has identified three pillars of action that will be crucial underpinnings for financing low-carbon, climate-resilient urban development. These are to foster: compact urban growth, connected infrastructure and clean technologies. These actions can drive cost and resource efficiencies, create jobs through the benefits of economies of scale and agglomeration and foster resilience and productivity. When these pillars are delivered with emphasis on principles of resilience and inclusivity, they provide the underpinnings of economically viable cities which, in turn, can finance the green investments that they need and which will greatly benefit their citizens.

Across 35 major cities in Ethiopia, Kenya and South Africa, investment in more compact, clean and connected cities is expected to deliver total benefits equal to US\$1.1 trillion by 2050, supporting hundreds of thousands of additional jobs compared to conventional fossil fuel investment. By 2050, investment in urban climate interventions in major cities in Ethiopia, Kenya and South Africa could deliver US\$240

billion, US\$140 billion and US\$700 billion in benefits, respectively — equivalent to 250% of annual GDP (2020) in Ethiopia, 150% in Kenya and 200% in South Africa. New investment in urban climate interventions is also expected to generate significant wider economic benefits, including additional employment compared to traditional fossil fuel energy consumption, resulting in an average of 210,000 net new jobs in Ethiopia, 98,000 in Kenya and 120,000 in South Africa to 2050.

For the 35 major cities in Ethiopia, Kenya and South Africa, delivering compact, connected and clean cities is estimated to require US\$280 billion of incremental investment by 2050—a significant level of investment when compared to forecasted spending to deliver national climate targets across the three countries. The case for such investment rests on potentially robust returns. The report estimates that, across all three countries, the net present value (NPV) or the extent to which benefits exceed costs over the period to 2050 yield very significant positive net returns. For major cities in Ethiopia, Kenya and South Africa, they are expected to be US\$90 billion, US\$52 billion and US\$190 billion, respectively.

Realising these investments is a difficult task for cities and local authorities on the continent, the vast majority of which, as discussed above, face budgetary constraints, high debt levels and poor creditworthiness. The complex, diverse and unevenly developed landscape in which sub-Saharan cities operate makes for a challenging environment to attract and deploy urban investment. The majority of cities in Sub-Saharan Africa (SSA) remain deficient in capacity, accountability, organisational structure and governance. Unless these barriers are addressed, finance is unlikely to flow at the necessary scale. In particular, without sound financial management, subnational governments will continue to lack the ability to generate meaningful own-source revenues or to attain the required creditworthiness or market access to attract financing from capital markets.

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<sup>12</sup> Haddaoui, C. and Manisha Gulati, M. 2021. Financing Africa's Urban Opportunity The 'Why, What and How' of Financing Africa's Green Cities. Coalition for Urban Transitions. London.



Addressing these barriers is not something that subnational governments can manage alone. This will require significant leadership from and collaboration with national governments. National governments play a strong enabling role in setting market conditions that draw in private sector capital for sustainable infrastructure programmes through a mix of non-financial actions such as enacting supportive policies, standards and regulations, as well as providing pricing signals and improving information flows. Four instruments that fall under the control or influence of national governments stand out here: national urban policies, fiscal decentralisation (under the right conditions), building city creditworthiness and land value capture.

In the context of their fiscal, financial and administrative capacities as well as their legal authority, cities can deploy a wide variety of financial instruments to finance climate

investments. The report set out six examples of financing instruments, all shown through pilots to be effective. They were scalable and contributed positively to sustainable urban development. The examples were: insurance pools to provide infrastructure repairs following extreme weather events; pay-as-you-use subscriptions for cooling and other energy efficiency services across domestic and public buildings; leasing agreements between city authorities and utility providers to leverage financial and technical capabilities for high upfront cost green infrastructure projects; public-private partnerships to outsource improvements and management of key infrastructure to the private sector; green bonds issued to raise finance for climate-friendly projects; and community-driven climate funds which enable local involvement prioritising which adaptation and resilience projects to fund from the dedicated climate budget.



Installation of a 1.2 MW captive solar power plant on the roof of a factory in the town of Ruiru, close by Nairobi. - Photo Lidia Daskalova  
© shutterstocks

# 4. TOWARDS A PROGRAM FOR LOW CARBON AND RESILIENT CITIES

## 4.1. LESSONS LEARNT

Researchers, governments, business community and non-governmental organizations worldwide are appreciating the complex interactions of environmental, economic, socio-cultural, political and institutional processes that produce urban vulnerability – i.e., “the state of susceptibility to harm from exposure to stresses associated with environmental and social change, and from the absence of capacity to adapt” (Adger 2006: 268). Urban resilience is the main approach to understanding and building sustainable futures. The concept of urban resilience is characterized by the capability and preparedness of cities to withstand and respond to severe shocks and make required changes for continuing functioning irrespective of the seriousness and degree of the shocks. This is important, as urban development in these changing times should address the vulnerability of cities and residents to manage the rise in economic and environmental burdens and volatilities linked to rapid urbanisation, climate change, poverty, globalization, and resource depletion. This resilience approach has influenced understandings of urban environmental problems, conceptualization of solutions, and production of intervening ideas especially in the Global North (see for example Schmitt 2013).

**Lesson 1:** The role of governments is important for addressing climate issues but the integration of low carbon development and resilience thinking and practice into **development planning, project development and city investment programs is not mainstreamed**. Policies and programmes for implementing climate-related initiatives are often prepared at the national level

but mechanisms to support their implementation at local levels are lacking. There are however examples of good practice at the local level. The eThekweni Municipality in South Africa has led in climate change adaptation and mitigation, mainstreaming these priorities into the planning and operation of the city of Durban (see below). Dakar (Senegal) was the first African city to produce a resilience strategy in partnership with 100 Resilient Cities (Ville De Dakar and 100 Resilient Cities, 2016). It established five priority goals: an inclusive resilience agenda by and for Dakar citizens, providing a healthy living environment to Dakar’s citizens, positioning the private sector as a resilience partner, leveraging energy efficient technologies (e.g., water harvesting) to support the city’s resilience, and promoting inclusive and efficient governance. Among the 23 supporting activities were teaching the concept of resilience in basic education, developing green spaces, making users aware of the rational and efficient use of energy, a competition to find innovative solutions, and strengthening dialogue between the central government and the municipality on resilience.

**Lesson 2:** Local city authorities operate in the context of enabling environments set by higher levels of government that set the **enabling and regulatory framework for both their capacity to invest in climate-related projects and for private sector investors in NDC-related sectors**. In the first instance this relates to the ability of local governments to set and raise revenue, especially in relation to local taxation. But more broadly, this generalised approach also often restricts the ability of city agencies and the private sector to overcome local constraints and take advantage of local opportunities. It



provides limited opportunities for integrating local actors, fostering community partnerships, and for more effective administrative practices and legal regimes. However, there is an increasing acknowledgment of the need for a more robust local level engagement across the continent (see for example UN-Habitat 2020).

**Lesson 3: There is a limited supply of needed climate finance to local governments and local enterprises wishing to decarbonize and bolster resilience.** City authorities have traditionally had limited access to financing for their investments, constrained by a limited revenue base, restricted mandates for engagement with the private sector and strict limits on borrowing. They are also constrained by the limited number and scale of financing institutions with appropriate mandates and mechanisms that can supply needed financing to local agencies. While there are a number of municipal development funds and national development banks that have full or significant focus on local governments, these institutions tend (with some significant exceptions such as DBSA) to lack resources and capacity, particularly when it comes to climate-related investment (IKI call).

**Lesson 4: Private and community investment is critical to achieving urban low carbon development and resilience.** There is an increasing recognition of local level action in achieving climate-related investment, however, significant constraints to both private sector and community action remain. Both awareness and resources are lacking. In relation to communities, legitimate issues of social justice and spatial equity need to be addressed. In particular, just mechanisms for dealing with relocation and resettlement are needed avoiding loss of livelihoods and the costs of displacement and loss of property. Good practice is seen in Cameroon, where city officials have engaged slum dwellers in disaster risk reduction through the Participatory Slum Upgrading Programme, with slum dwellers in Yaoundé, Kribi, and Bamenda trained to identify, map and analyse slum problems and to propose indigenous solutions and coping mechanisms (ICLEI 2016). Investment in community level technology is also important in building resilience through combining internet, social media and smart phones with low-cost sensor networks can provide extensive and real time information. For example, citizen science has been used in urban

areas at risk of repeated flooding in Mozambique (Kattelmann, 2003). Similarly, investment in ICT can help reduce vulnerability in communities by monitoring risks, responding to emergencies and improving climate warning systems.

**Lesson 5: Better systems for mobilisation of finance and for blended finance are needed.**

There are two major uses of blended finance (ref WEF Study): mechanisms supporting leverage of private finance; and mechanisms which actually provide direct, catalytic finance for this purpose. Development funders can use these mechanisms to structure transactions that address investor barriers faced by companies and projects in emerging and frontier markets. Use of **Supporting Mechanisms** – usually grants or guarantees – can attract and support private sector investment and financing by managing risks and reducing transaction costs. These Mechanisms can be structured to provide: technical assistance, risk underwriting and market Incentives. **Direct Funding** provided by development funders to a project or enterprise can also enable Blended Finance. Financial instruments such as grants, equity, and debt can all help facilitate Blended Finance. Such funding supports private investors and financiers to overcome perceived barriers in emerging and frontier markets at various stages of the investment life cycle to: prepare, reduce uncertainty and overcome high initial costs of a project; pioneer new business approaches; facilitate investments with high expected development impact but limited commercial returns; ‘crowd in’ private capital; and/or transition to scale, by demonstrating a pipeline that meets the needs of private investors. Successful examples of both types of blended finance occur across Africa – from internationally supported facilities such as the EBRD’s Green Cities Facility to the DBSA’s, but only a few are urban – far short of needs.

**Lesson 6: Coordination and Integration of Investment**

Building resilience in African cities is a collective responsibility, and the role of national governments is essential to local action. Moreover, it is difficult for African governments to commit to addressing the impacts of climate change when they are facing other perceived urgent development needs (Simon, 2014). Thus, leadership is needed to drive direction, improvements and changes in policy on resilience and climate change. African national governments



are required to provide this leadership. The responsibility of national leadership influences all partners within their sphere of influence in a coordinated manner. The increasing complexity of climate change means that dealing with them often extends beyond the capacity and mandate of local governments alone. By taking a national government approach to widening the circle of responsibility in resilience action, there is increased collaboration between local and national governments in climate risk prevention, preparedness, response and recovery. The South African government has, for example, worked hard to provide an integrated approach to climate issues across levels of government<sup>13</sup>.

## 4.2. CASE STUDIES OF OTHER CLIMATE RESILIENCE INITIATIVE IN AFRICA

A low carbon and resilient city is one that assesses, plans and acts to prepare for and respond to hazards – natural and human-made, sudden and slow-onset, expected and unexpected and does its fair share to mitigate GHGs deriving from the activities within its boundaries. The major resilience challenges of our era will be addressed in cities and, given their share of the GDP and energy usage, the battle to mitigate climate change impacts will be won or lost in cities.

Resilience in cities relies upon investment decisions that address the vulnerabilities of how individuals, communities and businesses cope when faced with multiple shocks and stresses. Thinking about urban resilience has involved an emphasis dealing with the technical aspects of three particular threats – natural disasters, ecosystem degradation and climate change, but is evolving to include a more holistic framing including the social and institutional context. Low carbon development bolsters resilience by increasing energy security and usually has health benefits from reduced pollution from the burning of fossil fuels.

Given this broad justification, the core question is

to establish viable and upscalable processes for planning, structuring and financing the required investment. Responding to the lessons learned set out in the above section and the constraints previously described, the following examples of good practice set out models that can be adapted to country circumstances.

### 1. The first approach relates to comprehensive integration in planning, project development and investment – the Durban Climate Action Plan (CAP)

Funded by the C40 in partnership with Durban, the Durban CAP explicitly referenced the Paris Agreement as its context and acknowledges the responsibility of cities to play their role in transitioning the economy towards a low carbon and resilient model. However, this transition is complicated in developing countries. In South Africa the challenges of unemployment, poverty and inequality must also be acknowledged even as the need to act with greater urgency in responding to climate change is recognised.

To address the need for rapid transformation, the eThekweni Municipality, with support from C40 Cities Climate Leadership Group (C40), has developed the 2019 Climate Action Plan (CAP) that builds on the 2015 Durban Climate Change Strategy. The CAP is a city-wide plan that provides a pathway to transition Durban towards climate resilience and carbon neutrality by 2050, in a manner that is inclusive and leaves no one behind. The goal of the plan is to ramp up ambition and action that is required to limit temperature increase to 1.5°C. This is vital to avoid catastrophic impacts, especially facing our more vulnerable communities.

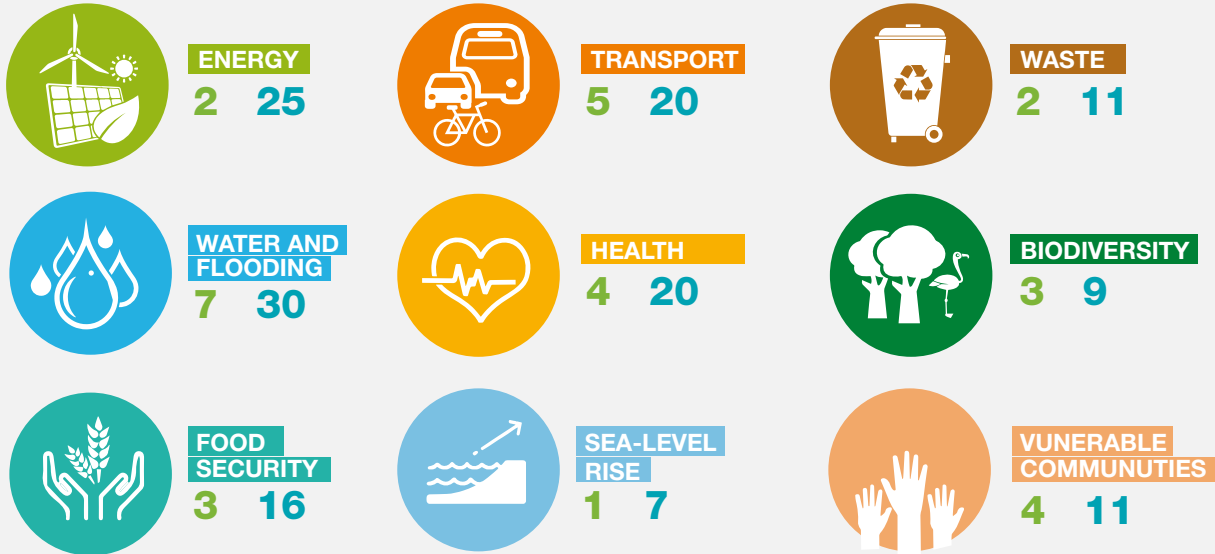
The CAP comprises of 33 actions and 149 sub-actions aligned to nine thematic areas (see diagram) that provide a pathway for Durban to achieve climate resilience and carbon neutrality. Durban sets out to achieve a 40% reduction in emissions from a 2015 baseline by 2030 and an 80% reduction by 2050 and has committed to identifying various opportunities to achieve carbon neutrality, including exploring the opportunity to generate carbon offsets, as the National Carbon Tax is implemented.

<sup>13</sup> [https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2019/06/GRI\\_Governance-of-climate-change-policy\\_SA-case-study\\_policy-report\\_40pp.pdf](https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2019/06/GRI_Governance-of-climate-change-policy_SA-case-study_policy-report_40pp.pdf)

## Snapshot of Actions

### 9 Themes

**33 High-level actions**    **149 Sub-actions**



Source: McCluskey, W, and Franzsen, R. (2014)

eThekweni Municipality realises that the CAP goals cannot be accomplished by the city alone and has set out where support is needed from national and provincial government, the private sector, civil society and the City's citizens.

The CAP described discrete initiatives in each of these nine sectors in sufficient detail to be able to scope projects and apply both nationally and internationally (for example with the C40 Cities Finance Facility) for funds to further develop and structure the projects. This in turn enable Durban to turn to both national and international sources of funding for its climate capital investments.

- The second approach is improving the enabling framework and revenue base of cities (demand side) – Property Tax Reform Programme in Sierra Leone<sup>14</sup>.**

As set out in the above discussion, the track record in achieving reform in revenue mobilization and in setting up institutions for efficient city investment has been fairly modest in Africa. The prevailing theme of the literature is that such reform and institutional change would be very beneficial but there are few instances of “success stories.” The conclusion seems to be that there is insufficient benefit to key stakeholders to achieve the momentum required for change. One of the few clear such successes, reflecting the need for major change post-conflict, is the property tax reform undertaken in Sierra Leone funded by the World Bank's Institutional Reform and Capacity Building Project and UNDP. Decentralisation was a priority following the war, with the Local Government Act of 2004 officially re-establishing five city councils, one municipal council, and 13 district councils. Local taxes are from five primary sources: the

<sup>14</sup> See Rebuilding Local Government Finances After Conflict: Lessons from a Property Tax Reform Programme in Post-Conflict Sierra Leone, Samuel Jibao & Wilson Prichard. 2016 <https://www.tandfonline.com/doi/full/10.1080/00220388.2016.1153073>

local (poll) tax, market dues, property taxes, business licences, and assorted fines and levies.

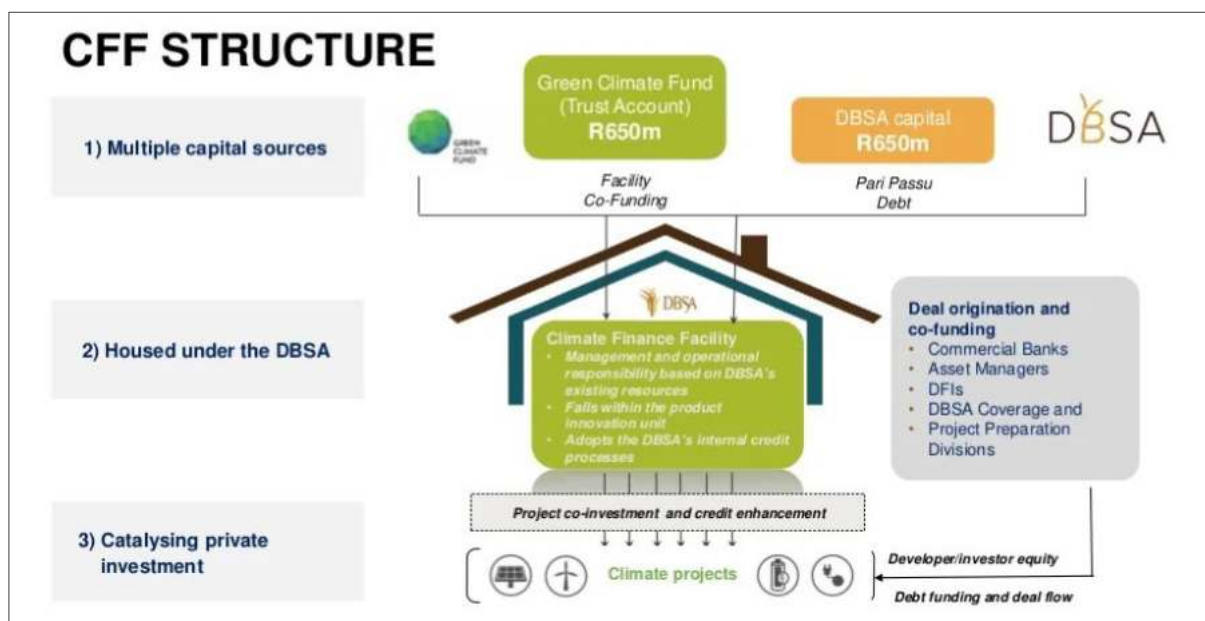
The reform programme was based on five stages – discovery, assessment, billing, sensitisation, and collection – and was designed with a focus on transparency, low implementation costs, and feasible implementation by locally recruited staff. Tax collection started from a very low base but nevertheless the gains were impressive. The largest gains were in Bo, where property tax revenue increased by four and a half times in real terms between 2007 and 2011. Gains have been somewhat more modest in Kenema, where revenue increased by 350 per cent in real terms, and much more limited in Makeni, where revenue roughly doubled in real terms over the same period. Tax compliance has improved and again is much higher in Bo than in the other two city councils.

The experience in Sierra Leone offers three broad lessons for reform initiatives. The first is the importance of long-term, hands-on, local partnerships, as they are most able to simultaneously address technical and political barriers to reform. Such partnerships are better able to overcome apparent capacity constraints, generate an internal constituency for reform and, most critically, contribute

to the development of a ‘fiscal contract’ between the government and taxpayers. The second, and related, message is the importance of emphasising the ‘politically contentious’ elements of reform noted earlier: transparency, outreach, and enforcement. These reform elements have proven pivotal to reform success, in significant part because addressing them successfully can contribute to the long-term political sustainability of reform. The final message is that the progress of local governments in implementing these ‘politically contentious’ elements of reform can act as a litmus test for local political commitment, and thus guide donors and central governments in targeting support more effectively.

**3. The third approach focuses on national support to build enabling frameworks on supply side for public and private sector investors – Development Bank of Southern Africa, Climate Finance Facility**

The Development Bank of Southern Africa (DBSA) – a sub-regional bank owned by the South African government – has established a significant green financing capacity for public and SME sector entities in particular. It administers the Green Fund that has the capacity to both undertake project development and investment. It has also established the Climate Finance Facility.



Source: Presentation by Muhammed Sayed, DBSA - OECD Focus Group Discussion: Developing a green finance facility to catalyse private investment, 27 October 2020



The Climate Finance Facility is the first private sector climate finance facility in Africa, using a pioneering green bank model. It will de-risk and increase the bankability of climate projects in order to crowd in private sector investment. Its successful implementation will prove that similar financial models can be replicated in other developing countries.

The Facility is a lending facility intended to increase climate-related investment in Southern Africa by addressing market constraints and playing a catalytic role with

a blended finance approach. Working with national Development Finance Institutions, the facility will use its capital to fill market gaps and crowd in private investment, targeting projects that are potentially able to attract market-rate capital at scale without “credit enhancement,” but that are currently unable to do so. It will focus on infrastructure projects that mitigate or adapt to climate change. The facility is cofunded by the Green Climate Fund (GCF). The Facility is summarised in the following table.

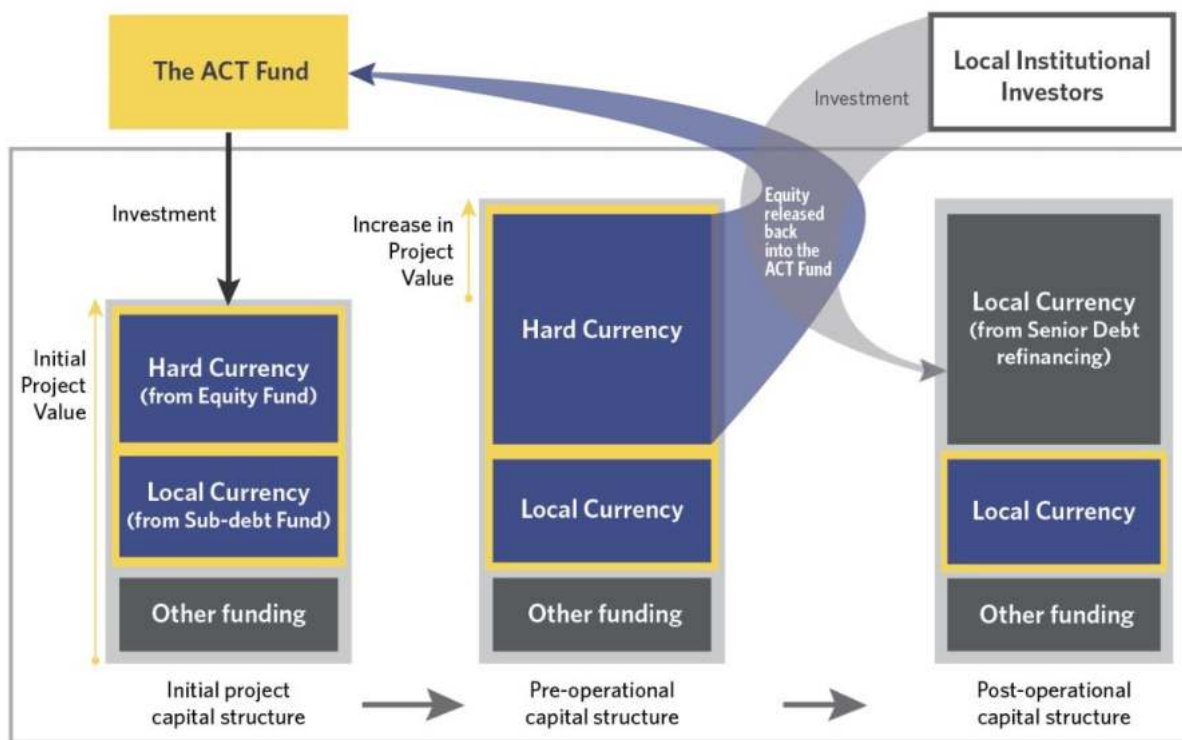
<b>Name of the project/ programme:</b>	FP098: DBSA Climate Finance Facility
<b>Accredited entity of GCF:</b>	Development Bank of Southern Africa (DBSA)
<b>Total project value: \$170.5m</b>	\$170.5m USD 55 million (loan) and USD 0.6 million (grant) from the GCF; USD 55.6 million from DSBA, USD 59 million from development finance institutions, USD 0.3 million from Convergence
<b>Target countries:</b>	Eswatini, Lesotho, Namibia, South Africa
<b>Theme:</b>	Cross-cutting
<b>Expected impacts:</b>	29.7 million tonnes of emissions avoided; 466,400 beneficiaries

#### 4. The fourth approach focuses on stepping up private sector finance for climate change including blended finance. – Nigeria ACT Fund as model<sup>15</sup>

The ARM-Harith Cities & Climate Transition Fund (The ACT Fund) is a mid-market greenfield infrastructure fund. The ACT Fund will expand the pipeline of investable sustainable infrastructure projects via a blended currency mechanism that reduces

financing friction at early project stages. At the same time, the mechanism de-risks international equity using structured exit solutions that mobilize additional local institutional investors. This will allow The ACT fund to invest in and exit more projects than in a traditional model, developing more high-quality West African climate infrastructure projects. The progression of funding is set out in the diagram below.

<sup>15</sup> See <https://www.climatefinancelab.org/project/the-act-fund/>



More specifically, the ACT Fund will:

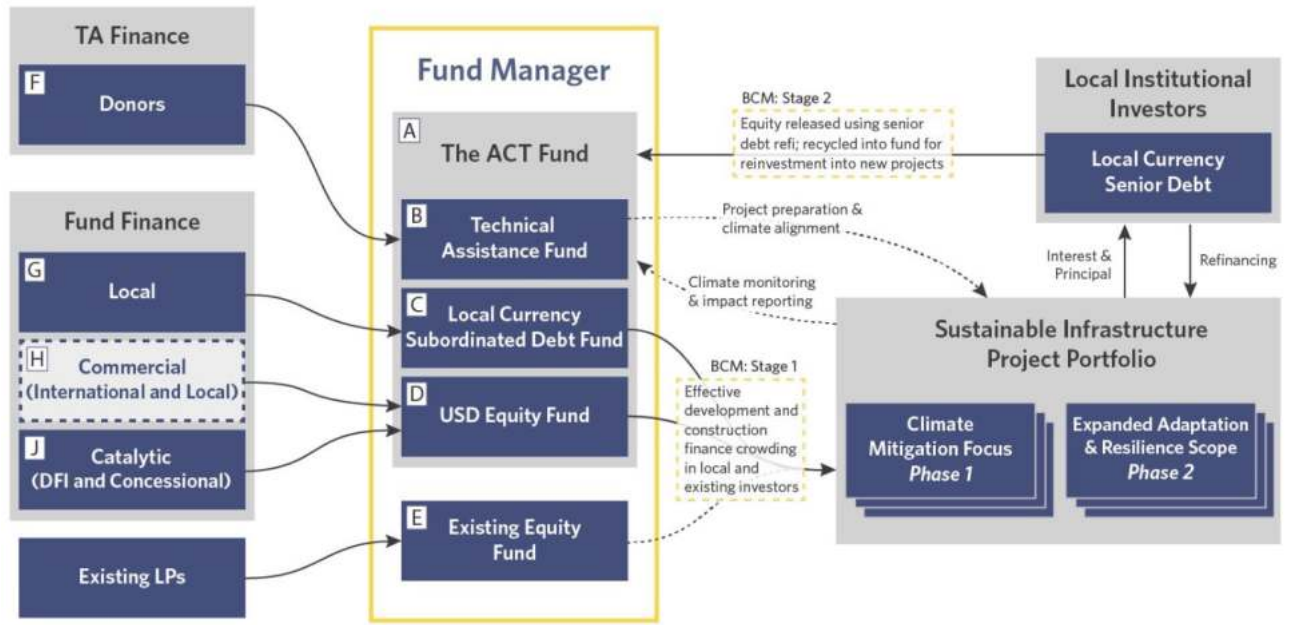
- Provide technical assistance to make projects investment-ready;
- Deploy equity and subordinated debt funds in tandem to finance and build these projects efficiently; and
- Arrange the exit of hard-currency equity by raising senior debt from local institutions once projects are operational and de-risked.

This proposed instrument is:

- **Innovative:** Introduces a blended currency mechanism that serves to overcome high transaction costs and lead times while de-risking international equity using structured exit solutions.
- **Financially Sustainable:** Provides strong, risk-adjusted return opportunities for a wide range of investors seeking equity, subordinated debt, and/or senior debt exposure.

- **Catalytic:** The instrument's blended finance structure can mobilize private capital at an estimated 4.1x multiple on initial funding, with the potential to drive billions in private sustainable infrastructure investment.
- **Actionable:** ARM-Harith is an existing infrastructure fund manager with a solid backing of shareholders and limited partners, with a team with more than 90 combined years of investment experience.

The Fund is targeting USD 150 million to capitalize the equity fund and USD 100 million for the subordinate debt fund, with plans to start deploying capital in Jan 2023. The proposed structure is set out below.



In 2015, the AfDB approved an 141M USD loan to finance the first bus rapid transit (BRT) project in Eastern Africa : the implementation of 20.3km of exclusive BRT lanes in Dar es Salaam. By improving public transport offer the project reducing traffic congestion and related carbon emission. © AfDB



# 5. RECOMMENDED POLICY, PROGRAMME & POLICY INITIATIVES TO BE CONSIDERED BY THE AfDB

The analysis presented in this paper suggests that there are limited but growing efforts towards developing resilient and low carbon African cities, and that models of successful funding and financing are available. But the resources currently mobilized are far short of the estimated \$200 billion per year by 2025 and close to \$400 billion per year by 2030 for energy transitions and related investments in sustainable infrastructure; investments in climate change adaptation and resilience; and restoration of natural capital (through agriculture, food and land use practices) and biodiversity. All three areas are important for the continent although relative needs will vary by country<sup>16</sup>. Addressing climate change has the potential to contribute to meeting other development needs (Albers & Deppisch, 2012; Jabareen, 2013; UNISDR, 2013).

The foregoing analysis shows that building climate resilience offers cities enormous opportunities to invest in low carbon cities and to deal with climate change vulnerabilities and adaptation. It is recommended that the African Development Bank focuses on the following key areas to address identified constraints and to stimulate such development across African cities.

## 5.1. FOSTERING INVESTMENT TO IMPLEMENT NDCS AND NAPS: COORDINATION SYSTEMS AND BUSINESS MODELS

Critical to addressing climate issues in Africa will be a systematic approach to investment in low carbon and resilient infrastructure and production. This approach begins with assessing

the country's NDCs (and NAPs where relevant), clearly defining investment needs and assigning responsibility for implementation to various levels of government. These levels will all play a role but the role of cities and the various agencies that manage them will be critical because of the large and growing proportion of the economy that they represent. They both have both the motivation to act because of their vulnerability and – at least in aggregate – the resources needed to fund action. Systems of support to city program and project development will thus be required to define, prioritise and structure pipelines of climate investments. Systems of coordination across levels of government will be essential in this effort.

<sup>16</sup> <https://www.brookings.edu/blog/africa-in-focus/2022/02/08/the-criticality-of-climate-finance-for-africa/>

The types of investment programs are numerous and will vary in priority according to the circumstances of the countries and cities concerned. In general, sustainable energy and energy efficiency investment modalities and business models are well known and established<sup>17</sup>, but modalities for investment in resilience are less well established, particularly because revenue streams deriving from adaptation projects are not necessarily straight forward. Some important approaches that can be fostered by appropriate enabling environments at both national and local levels are set out below.

**Nature-based solutions** (NBS) are an important investment path for the African Development Bank to assist African cities build resilient futures. Nature-based solutions include actions to protect, sustainably manage, and restore natural or modified environments. These actions are designed to address urban challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. Investments in these NBS are often considered at relatively small scales with unique goals in mind based on the services needed at a given location and the specific local climate change impacts. For African cities, NBS investment will vary from one city to the other depending on individual needs, but can focus on:

- provision of increased tree canopy cover,
- protection or restoration of streams (waterways)
- development of urban storm-water management structures,
- increased provision of parks and open spaces, and
- restored coastal ecosystems (e.g., mangroves) to serve as protection against floods.

Investment and use of NBS in African cities can play a significant role in urban adaptation to climate change. In fact, several climate change impacts – e.g., warmer temperatures extended heat waves, droughts, and flooding – are exacerbated in cities because of the attributes of urban systems, including high impervious cover of cities, concentrations of waste heat

and pollution, interdependent infrastructure, the concentration of people and infrastructure, and socioeconomic disparities.

Further to the climate benefits of investment and use of NBS in cities, these investment strategies can promote biodiversity, improved human mental and physical health, and other social benefits such as reduced crime and increased social cohesion (see for example Engemann et al., 2019). While many NBS pay for themselves over time, many African cities will need help financing up-front costs (e.g., new supplies and equipment), and additional incentives can speed adoption. More importantly, good governance is required to ensure that these solutions get implemented at appropriate scales.

An example of the adoption of NBS to urban greenery is found in a Tanzanian city:

“During 2017, Dar es Salaam City Council identified an urgent need for decision support to prioritize investment in greening. A collective was formed, consisting of representatives from Dar es Salaam City Council, the five Municipal Councils, Regional Government, local universities, relevant nongovernmental organizations, and local experts and a small facilitating team, consisting of ICLEI and UFZ. Partners contributed data and deliberative insights to coproduce a Thematic Atlas. The Atlas indicates the spatial location of existing natural assets in the city and the locations of pressing urban issues such as urban heat islands and areas of poor air quality. A range of policy responses were identified for each issue, supported by ecosystem services concepts. The Atlas also provides a basis for designing local-scale demonstration projects to encourage continued co-learning about the costs and effectiveness of such initiatives. The first greening demonstration project is proposed for the Sinza area of Dar es Salaam” (Gómez-Baggethun & Barton, 2013)

The Tanzanian experience suggests that mainstreaming and upscaling NBS in urban systems will require major investments, both in

<sup>17</sup> See for example, GCF Cities Guidance: <https://www.greenclimate.fund/document/sectoral-guide-cities-buildings-and-urban-systems>

terms of retrofitting existing structures and in areas of new development. These investments can be funded by various forms of Payment for Ecosystem Services (PES) modalities<sup>18</sup> or through surcharges on areas benefiting from infrastructure upgraded through NBS. As an example of PES schemes, where specific ecosystems are important to the water supply of a city, for example, a surcharge on the water bill to support communities that are the custodians of those ecosystems is justified. This model has been applied in a number of cities in China<sup>19</sup> and has been adapted even for large cities such as in relation to the Ciliwung river in Jakarta<sup>20</sup>.

Another funding model for ensuring continuity and maintenance of NBS can be in the form of a municipal fund open to external/ community contributions. In Australia, the City of Melbourne launched the Urban Forest Fund in 2017 with \$1.2 million seed funding. This financing model targets the cost barriers of green infrastructure on private land that is 75% of the city area. It provides financial support to new greening projects that otherwise would not be funded, such as green spaces, tree planting, vertical greening or green roofs. It also accepts private contributions who want to contribute to greening the city. The premise of this model is that green infrastructure creates public benefit by reducing the urban heat island effect, enhancing biodiversity and reducing air pollution and stormwater runoff. This justifies using public funds to incentivize greening privately-owned space. Similar funding schemes can be launched in African cities to help develop resilient environment.

**Waste and water management** via investment and adoption of recycling approaches and construction of storm drains will significantly reduce the problem of solid waste, particularly e-waste, and liquid waste in many African countries, particularly Ghana. Investment in recycling and storm drains will help to minimize pressure on land fill sites and reduce flood events respectively.

And more importantly, recycling also reduces air, water and land pollution caused by poor waste disposal that have characterized urban Africa.

Materials that take decades to decompose can simply be converted into useful new substances through recycling. For instance, discarded rubber materials (e.g., tires) can be made into swings as a recreational equipment in children playground and shredded rubber can be used as additive in asphalt pavements. Similarly, plastics accounts for about 10% by weight of municipal waste. It can be recycled into new products, rather than the current situation of depositing in landfills, oceans, and storm drains. Other recyclable materials include metals, glass and papers. A resilience plan that sets an agenda to address solid waste management problem in African cities is a necessary step in advancing sustainable development ideals. Establishing viable business models for recycling is sometimes difficult. Some metals have intrinsic value, but plastics may need some form of support whether it is through payment for their use in waste-to-energy plants or in linkages to wider recycling systems.

While investment in **sea defense management systems (e.g., walls, drainage, water management)** requires high capital, it remains an important intervention in vulnerable coastal communities across the continent, including West Point in Liberia, Beira along the coast of Mozambique, and Accra along the coast of Ghana, and should be a critical strategy in a resilience plan. Sea-defense management systems can be effective in protecting infrastructure against erosion caused by waves, storms and sea level rise. However, building sea defense management systems remains a contentious issue. Research shows they can play a role in the disruption of natural processes that lead to the erosion of sand sediment from beaches (French, 2001). Although their primary function is erosion reduction, they have a secondary function as coastal flood defenses. Although they do not address the causes of erosion, they prevent further shoreline erosion (French, 2001). When considering adaptation to climate change, another advantage of sea defense management system is that it is possible to progressively upgrade these structures by increasing the structure height in response to sea level rise. The successful use of sea defense management system in Keta in the Volta Region of Ghana could be a case study for

<sup>18</sup> See [https://www.pnas.org/doi/10.1073/pnas.0705503104#:~:text=Payments%20for%20ecosystem%20services%20\(PES,flood%20mitigation%2C%20or%20carbon%20sequestration.](https://www.pnas.org/doi/10.1073/pnas.0705503104#:~:text=Payments%20for%20ecosystem%20services%20(PES,flood%20mitigation%2C%20or%20carbon%20sequestration.) for a more detailed explanation

<sup>19</sup> See Cheng, X.; Fang, L.; Mu, L.; Li, J.; Wang, H. Watershed Eco-Compensation Mechanism in China: Policies, Practices and Recommendations. *Water* 2022, 14, 777. <https://doi.org/10.3390/w14050777>

<sup>20</sup> See Saridewi, T.R. and Fauzi, A. (2019) 'A market-based mechanism as an alternative solution for watershed management: a case study of the Ciliwung Watershed, Indonesia', *Int. J. Global Environmental Issues*, Vol. 18, No. 2, pp.171–186



further adaptation and implementation in other contexts. Financing modalities for such defenses should reflect their benefit to the wider community and those industries and households benefiting from them should contribute. The most effective and direct way to do this is through the property tax system.

## 5.2. STRENGTHENING LOCAL GOVERNMENTS TO IMPLEMENT CLIMATE INVESTMENTS

National, local authorities and other agencies involved in city development can take a series of actions to better mobilise their resources for low carbon and resilient development in cities. Strengthening the capacities in:

- planning for mitigation of GHG emissions and climate resilience, through evidence-based city climate action plans. These plans ought to be informed by climate vulnerability assessments, and be developed with the input of local communities and with the support of stakeholders across relevant investment sectors as we have seen in relation to Durban above;
- use of project development entities (such as project preparation facilities), through national governments, national financial institutions, and through development assistance and IFIs, which can support the development of bankable projects of high climate performance. This process should assist urban agencies and enterprises in structuring projects to attract both public and private sector finance as appropriate and available. Some National Development Banks, such as DBSA discussed above, have project development facilities available to public and private sector entities needing assistance in designing and structuring climate investment projects and this model can be replicated; and

- improving implementation structures and fiscal management particularly in relation to maximising own source revenue and maximising leverage of public resources as discussed above.

The first two of these areas have been discussed in some detail above, but the last area needs to be further elaborated with examples from outside the region. Climate investment is facilitated by the presence of agencies which have the ability to engage in comprehensive long term planning, coordinate across sectoral silos, enter into long term contracts, and into PPPs. They are able to do so by using diverse range of financing partners and modalities, enabling them to leverage private sector finance and effectively oversight implementation.

An example is the Johannesburg Development Agency which was created to deliver sustainable social and economic infrastructure projects; support growth and development of strategic economic nodes; and to promote economic empowerment and transformation by structuring & procurement of JDA developers. Its project funding typology includes: “Development Fees” (7,5% charge for implementing a project on behalf of the government); cooperation with provincial and local government departments (e.g., Dept. of Health in improving clinics); public funds, namely the City of Johannesburg and national and provincial sources; no formal PPP agreements but cooperation with private sector (long-term lease to private investors); and City Improvement District Partnerships with Industrial Development Corporation. Their Integrated Development Plan was translated into concrete innovation for climate action (e.g.: Corridors of Freedom, Ebony Park Eco-Clinic,) or smart city actions for public participation.

The Pune Smart City Development Corporation in India is more integrated into the structure of the local government and has structures for inter-organisational coordination and cooperation fostered under the national Smart Cities program. Participating cities need to establish a credible Special Purpose Vehicle (not the conventional use of the term, which is used for PPP financing

structures). This vehicle has the mandate to coordinate all necessary agencies and establish appropriate implementation vehicles for projects (including PPPs) under the Smart City program.

There are also a number of examples of reorienting revenue mobilization and revenue-related measures to reinforce climate goals. Cities should consider, their ability to levy taxes on “bads” such as the use of fossil fuels and consequent pollution, and national governments should facilitate this process. Simple measures such as charging significant amounts of money for parking and congestion charges reduce congestion and GHG emissions. Conversely, cities can use a “carrot” approach by providing incentives such as floor space ratio bonuses for green development while keeping infrastructure and other development fees constant.

Such measures are particularly needed as cities will need to mobilise to bolster finance, both as a response to COVID impacts and in anticipation of future impacts on revenue streams from climate threats. Coastal cities suffering from seawater intrusion are likely to see property prices decline, and thus property taxes. Intense rainfall events which overcome drainage defenses can bring entire regions to a halt. For instance, this was, the case in Bangkok and its surrounding region in 2011 which caused 815 deaths and property damage estimated at 1.425 trillion baht (USD46.5 billion).

**National Level Action<sup>21</sup> - Demand-side**

On the demand side, effective national governments should promote better governance structures and enabling frameworks for Urban Climate Finance accessible by cities, as argued above. The AfDB could support critical elements of the enabling framework for city climate finance through strengthening systems for:

- **Localising NDCs:** supporting national agencies to define and undertake processes for fostering required NDC investment by sub-national governments and to match these responsibilities with resources.

- **Establishing adequate structure and incentives for intergovernmental fiscal transfers:** Given that transfers will remain important for African cities even if local revenue mobilisation is improved, the design and quantum of these transfers needs to be efficient, effective and commensurate to needs. Transfers need to make up for local resource shortfalls (as determined by local revenue raising capacity versus needed investment levels) and be structured to maximise the incentives for local revenue mobilisation and to be both flexible and encouraging of innovation in their use and in leveraging them.
- **Creating market incentives in NDC sectors:** For many NDC-related investment sectors (such as energy), significant non-transparent subsidies are often present and/or regulation makes entry of alternative service providers difficult. In many cases, such subsidies are intended to benefit lower income groups and are well intentioned. However, such structures make it difficult for suppliers trying to introduce alternative, lower carbon, processes or more effective means of resource use/ reuse. Making such subsidies available in non-distorting ways can open additional investment pathways.
- **Fostering Green Government Finance:** Greening of financial systems, being able to track climate finance flows, particularly at local government levels, needs to be supported. National adoption of green procurement systems will also be important ways and can open additional low carbon or adaptive investment pathways. In addition, enabling the creation of flexible partnership structures for investment through the use of regional utilities and area-based development corporations (see the Pune example above), each with their own sustainable funding sources, can also open new investment pathways (for example, using PPPs).

Addressing challenges related to the operational and implementation issues of the demand side of climate finance requires AfDB and others to provide:

<sup>21</sup> This text is adapted from forthcoming chapter in OECD publication on intermediary cities: Lindfield, M. (2022). Financing for climate investment in intermediary cities. OECD. Paris

- **Project development support:** There are a number of facets that need to be addressed when providing such support. Support for local governments and other agencies in establishing climate risk assessments and GHG baselines, together with advice on options for project financial structuring, can be important. This support should also foster a structured process of city climate planning such as the C40 CAP process, which defines the investment program that will enable the city to deliver its fair share of NDC commitments (or Paris targets if NDCs are insufficient). In the post-COVID-19 context, these investments need also further economic resilience and employment. Such support can be in a dedicated facility or provided by sectoral ministries.
- **Technical support:** Many agencies may not know what technical options exist and are applicable for NDC investments in their particular circumstances. International sources of support for technical assessments are available, for example through the Climate Investment Funds and MDBs. Such support can be delivered by government agencies or academic institutions which in turn may need to be strengthened in order to provide such services.

Addressing capacity gaps in to access climate finance require AfDB and others to foster multi-stakeholder engagement and include:

- **Building capacity development institutions:** National governments should establish and disseminate best practice in climate technologies, and in technical and financial assessment through local government academies, professional development mechanisms, and other means, ensuring that there are no barriers to the participation of small and medium-sized city participants.
- **Promote multi-stakeholder involvement:** National governments should undertake dialogue with small and medium-sized city policy makers and CFOS with financial institutions to build databases of city financial data and performance in NDC sector investment as well as opening pathways for NDC investment by developing systems for assessing, monitoring, and evaluating climate investments. This will provide data supporting investment risk assessment and project design.
- **Promote International support:** There are multiple avenues of international support for project development (CFF, Gap Fund, etc), NDC implementation (NDC partnership, UN-Habitat, etc) and for policy development (GEF, OECD etc). National governments should encourage and support cities to band together to merge their potential pipelines of projects to achieve a critical mass of investment needed to justify the engagement of such agencies and facilities.

**Sub-national Level Actions<sup>22</sup> for better access to climate finance:** demand side

On the demand side, sub-national governments should promote better governance structures and enabling frameworks for Urban Climate Finance in cities. AfDB support can improve the enabling frameworks, by:

- **Establishing Urban Climate Planning and Project development systems:** This may entail setting up mechanisms of planning for implementation of localised NDC investments, undertaking city climate assessments (mitigation & adaptation), and developing climate action plans (with project pipelines & budgets). These systems should include analysis of local enterprise contributions to GHG emissions and their vulnerability and recommend ways to promote their emissions reduction and resilience;
- **Setting up Regional Corporate Structures and Local Area Development Agencies:** Cities and networks of small and medium sized cities should assess the most efficient spatial unit of investment for localised NDCs and design appropriate organizational structures to finance and implement required NDC investments. These actions should take into consideration, the inter-jurisdictional structures which include a number of local

<sup>22</sup> This text is adapted from forthcoming chapter in OECD publication on intermediary cities: Lindfield, M. (2022). Financing for climate investment in intermediary cities. OECD. Paris



governments. These could be a metropolitan authority, a development corporation, a regional utility, etc. As part of the structuring of such entities, consideration should be given to enabling them to provide planning and other incentives for green development.

- **Promote Green Financial Management:** Local governments and other agencies need to maximise their own source revenue using green taxes and fees where possible, adopt green procurement processes, maximise the use and leverage of their assets in green investment (land etc) and structure to maximise the leverage of PIC finance. In addition, Agencies need to adopt and adhere to internationally recognized accounting standards and other means of transparent and accountable financial management.

AfDB can also help sub-national governments address constraints in operational and/or implementation systems of climate finance. Some of them can include:

- **Establishing Urban Investment Agencies or Corporatised Utilities:** These agencies need to be mandated to develop green investment programmes, aggregate projects for efficient financing, assess projects as per appraisal systems (see below), build climate project development and structuring capacity, including through local consultants and/or local tertiary institutions etc. These agencies should be mandated so they can engage effectively with the private sector both as co-investor and financier. They should also have robust funding structures based on such mechanisms as property tax and Land Value Capture (LVC).
- **Implement Investment Appraisal Systems:** These systems need to be able to assess the viability of a program of investment. They need to take into account: the scale of resources needed; the fiscal context of the investing agency; the financial risk associated with the investment; the operational risk including the availability of service; access and reliability of performance, as well as the

cost and affordability to consumers, and the complexity of proposed implementation structures relative to the Agencies' technical capacity. The agency should also be able to obtain expertise to assess mitigation and adaptation benefits of a project, as well as assessing its eligibility for required licences etc, its financial viability, other co-benefits and compliance with safeguards.

AfDB and others can help building the required capacities in city climate finance by:

- **Building and supporting capacity development institutions:** A proactive policy of building the capacity to manage such Agencies and to undertake the required program assessments should involve local tertiary institutions and professional development mechanisms. Where the community will play a key role in implementation, local CBOs will need to be strengthened. Drawing on national and international resources, and adapting them to the local context, governments of cities need to disseminate best practice in climate technologies and in technical and financial assessment.
- **Enable multi-stakeholder involvement:** Critical areas of stakeholder involvement are in establishing local enterprise support needs and in community awareness raising (also in determining ability and willingness to pay). Cities should be willing to share and benchmark performance and financial data to inform such stakeholders.
- **Invite international support:** Some international support is directly accessible by cities themselves without having to apply through or at higher levels of government. For instance, some international institutions that can directly support cities include: development entities such as CFF and the Gap Fund, institutions supporting NDC implementation such as UN-Habitat, and policy development support through a variety of international NGOs (WRI) and city networks (such as C40 and UCLG).

### 5.3. STRENGTHENING FINANCIAL SYSTEMS TO SUPPORT CITY CLIMATE INVESTMENT<sup>23</sup>

There are a number of ways financing systems can be better structured to support urban climate investment and that address the supply side constraints of the finance market. The most flexible is to provide support to financing facilities that are structured for a diverse range of financing contributors at fund and project levels (public/private), which maintain flexibility in respect to type of support (debt/ equity) and type of entity supported (local government, SOE, company

and household) can be an important intervention to addressing supply side constraints of climate financing. Furthermore, providing structures to foster aggregation of projects where investments are small, as often the case in small and medium-sized cities, can be particularly useful for these types of cities.

The elements above are common across countries, but the depth and sophistication of the interventions in each will differ according to the human and financial capacities of the cities and relevant institutions. Indeed, because of this differentiation, a general typology of climate finance mechanisms is difficult to develop but, the structures outlined in the table below have been, or could be, used for climate finance in intermediate cities:

Typology of climate finance mechanisms

TYPES OF INSTITUTIONS	TYPE OF FINANCING	EXAMPLES
Development Partners	Technical assistance by a development financing agency or NGO to bolster enabling frameworks, planning systems of project development activity Pilot investment activities	The C40 Cities Finance Facility GIZ finance of Energy Efficient multi-unit housing in Ulaan Bator
	IFI catalysed facility tapping international institutional finance	IFC Managed Co-Lending Portfolio Program (MCP)
IFI catalysed mechanisms	IFI - catalysed blended finance facility, usually at a national development bank	Shandong Green Development Fund (SGDF)
	IFI direct lending for specific sectors	IADB cluster project (which addresses infrastructure and SMEs in the Mendoza Project in Argentina)
	IFI subsovereign lending (in theory the same mechanism could be used by international private banks)	EBRD's use of Public Service Agreements (PSAs)
National Initiatives	National Development Bank (NDB)-led (in theory could be led by any financial institution including private ones)	TNUDF India use of aggregation mechanism
	Tapping the private capital market	Komuninvest Sweden use of aggregation mechanisms for green bonds
	Small scale local finance	Mongolian microfinance for Cooking, Heating, and Insulation Products and Service (CHIPS)
	City green funds (numerous cities have environmental funds for use in local projects that could be leveraged for larger projects)	
Private Sector	Private climate finance funds seeking direct / primary market equity investment and direct lending opportunities in GHG mitigation, renewable energy generation projects and Energy Service Company (ESCO) arrangements are growing and have invested in/ been used in cities, mainly in OECD countries.	

Source: Author's own elaboration adapted from forthcoming OECD publication

<sup>23</sup> This text is adapted from forthcoming chapter in OECD publication on intermediary cities: Lindfield, M. (2022). Financing for climate investment in intermediary cities. OECD. Paris

Any of the financing structures outlined in the table can potentially (given appropriate partnerships) be augmented with GCF, GEF, CIF or development assistance finance to increase potential concessionality. As will be seen from the descriptions, these different mechanisms address different types of urban agencies. A given country will almost certainly need more than one type of climate financing structure to address the range of agencies in cities. There are a number of examples that incorporate the above responses and mechanisms. There are also numerous international agencies and domestic agencies in some countries that can assist cities in various aspects of obtaining climate finance. Although not all are climate-focused, they can accommodate climate projects from a range of cities. For instance, the TNUDF and Kommuninvest are specifically designed for small and medium-sized cities.

Where the mechanisms are not specifically designed to focus on climate projects, they can be made so by applying a relevant taxonomy and changing the project-level assessment criteria to screen for quality climate-positive projects. The GCF has an assessment process that is applicable at project level. While not perfect, its Investment Framework does take into account both specific climate outcomes and a range of non-climate factors that are critical in ensuring that a project will actually be implemented. The assessment criteria used by the GCF Investment Criteria were used in the Shandong Green Development Fund (SGDF) used an initial screening based on a modified Peoples' Bank of China (PBOC) taxonomy, and then assessed the impacts of the project across multiple metrics based on the GCF investment framework. These assessments consider the levels of GHG reduction and adaptation benefits; its potential for scaling up and replication (paradigm shift); delivery of co-benefits/ sustainable development (e.g. pollution reduction and employment); value add of the financing and the capacity of the proponent to implement (needs of recipient and ownership); as well as efficiency and effectiveness. The resultant performance of the project determines the level of concessionality awarded.

### **National Level Action - Supply-Side**

On the supply side, national governments need to foster capital market institutions, which address higher risk profiles of all types of cities and their enterprises, such as the structures used by TNUDF and Kommuninvest. AfDB can assist national governments to enhance the enabling frameworks of supply-side climate financing by:

- **Greening the financial system:** The national government needs to put in place a regulatory and reporting framework for green instruments (green bonds, insurance etc) that are accessible by investment agencies. They also need to create incentives to maximise the deployment of these green instruments. Climate and transition risks need to be incorporated in macroprudential regulation (to avoid stranded assets etc.). Throughout this process, it is important to ensure that regulations and processes are not designed so as they inadvertently exclude urban agencies in small and medium-sized cities (for example with minimum revenue levels).
- **Greening government finance:** Government financing needs to re-focus revenue mobilisation, by taxing "climate bads" such as GHG emissions, pollution, and congestion (green taxes & fees). In doing so governments should ensure that smaller cities, which, for example, may currently be more reliant on small-scale vehicular transport have assistance to funds for transition investments such as hybrid minibuses. Such things as generalised debt limits and restrictions on PPP for green investment should be examined to ensure that they do not disadvantage small and medium-sized cities.
- **Capital market regulation:** Maximise potential financing for private climate investments by local and international institutions by, for example, including NDC sector infrastructure in permitted investments for pension funds and insurance companies. National governments should track NDC sector expenditure by capital market participants and institutional investors. In



doing so they should ensure that access to finance by intermediate cities is maintained by enabling the use of support aggregation structures whereby a number of smaller investments can be bundled into a fund, facility or similar financing structure.

National governments also have large roles to play, in implementing actions to address the capacity gaps in the supply side of climate financing. AfDB could support:

- **Development of taxonomies:** The taxonomies define what is “green” and it is important that the definition is clear. To this end, it will be necessary to nominate a lead agency (i.e. Central Bank, Ministry of Finance etc) to coordinate and to oversight the development and use of MRV systems. Finance ministries also have a key role in facilitating the dissemination of systems to financial institutions and their clients. Special outreach systems may be required for the CFOs of small and medium-sized cities.
- **Establishing technical support to green instruments:** Finance ministries and associations of financial institutions will also have a key role in fostering the dissemination of appropriate structures and capacity to assess and structure green investments as well as to utilise such instruments as green infrastructure debt/ equity funds and green bond systems. However, it is important to reiterate that support to financial institutions and their clients in respect of the use of these instruments may be necessary. Central to this will be technical support in the use of MRV systems.
- **Establishing catalyst facilities:** In order to catalyse financing of NDC-linked investments special purpose financing facilities may be needed (such as SGDF discussed above). This will be necessary in order to address issues of unfamiliarity of investment types and instruments and to leverage government finance. Such facilities can be stand alone or developed inside a public or private financial institution (e.g., an NDB) and may include project development capacity, use of blended finance to leverage PIC finance

and other aggregation instruments in order to improve accessibility for urban agencies with smaller investments (in particular, in small and medium-sized cities).

- **Build required capacity:** National governments can encourage capacity development institutions such as banking associations and institutions providing professional development for the staff of financial institutions to establish & disseminate best practice in climate technical & financial assessment and in MRV systems focusing on investments in NDC sectors.
- **Facilitate International support:** A range of international agencies, such as GCF, donors, and other agencies can support the development of appropriate enabling environments and of operational measures, including with the provision of finance. Numerous projects and support facilities have been structured to include access by cities. The latter may include project development assistance for cities, and sometimes for specific sectors such as low carbon transport. Specifically, the EU, GCF and GEF have supported blended finance facilities, and the NDC partnership, UN-Habitat, the Green Bank Network and GEF, specific development agencies (GIZ) and OECD have supported the development of more effective enabling environments.

***Sub-national Level Actions for better access to climate finance:*** Supply side Similarly to national governments, sub-national governments have a range of opportunities to address the supply side constraints of climate finance. As priority actions, sub-national governments need to foster local financing and funding systems which cater to their infrastructure investment needs and the needs of their enterprises. Below are a series of actions that AfDB can undertake to strengthen the enabling framework for climate finance at local level:

- **Identify opportunities for greening finance planning:** Subnational agencies need to be able to assess opportunities for the use of green financing instruments in the context of cities’ investment needs and their ability to

undertake the funding/ revenue mobilisation required for both debt service and counterpart funding. Each of the instruments, for example green bonds, green insurance or equity, will have certain structural prerequisites, in the case of equity a corporate vehicle is needed etc. Potential green finance sources (green facilities) need to be assessed in relation to the conditions they require, for example, the establishment of specific MRV systems.

- **Establish Local climate finance instruments and incentives:** Sub-national agencies will need to establish a regulatory base for new funding instruments/ incentives (LVC etc) in order to establish funding base for city agencies undertaking climate investments, as discussed above. They may also need to develop a regulatory base for financing structures that support use of aggregation instruments by financing institutions.

AfDB can also assist in addressing the operational and capacity constraints of climate financing at local level which may call for:

- **Implementing Green Financing Systems:** Subnational governments (or groups of local governments) can establish local green funds and develop mechanisms such as PPPs to leverage their own resources or those of established funds. They need to prioritise lowest cost funds (whether labelled as “green” or “climate” or not) to non-revenue earning projects with higher cost financing used for more financially viable projects. Local funds should consider possibilities of using instruments that enable the aggregation of small projects.

- **Implement Green Funding systems:** Subnational governments should implement new green taxes/ fees including LVC-type taxes etc. Taxes and fees on pollution (e.g., congestion charges), where structures are developed in partnership with other stakeholders or governments, ensure that the mechanisms of cost sharing and co-investment are clearly established and sound.
- **Build capacity development institutions:** The awareness of best practice in climate financing instrument design, project assessment and MRV requirements needs to be raised through local institutions linking local financial institutions, such as banking associations and mechanisms for financial institutions’ staff professional development. Also in relation to Community Based Organisations (CBOs), capacity to handle local revolving funds for neighbourhood infrastructure may need to be built.
- **Invite international support:** As discussed above, some international support is directly accessible by cities themselves without having to apply through or at higher levels of government. For instance, entities such as the Green Bank Network and GGGI can help with local funds, and some international NGOs (WRI) and city networks (C40 and UCLG) can help with capacity building for assessment of financing instruments and options.



AfDB President visit to a Water Treatment Plant in Nouakchott - September 2022 © AfDB



# 6. CONCLUSION

The on-going climate emergency is a major threat to the development prospects of Africa. The AfDB has highlighted the fact that the Continent is 'the most vulnerable continent to *climate change impacts under all climate scenarios above 1.5 degrees Celsius*'<sup>24</sup>. Africa contributes just 4 percent of global total greenhouse gas (GHG) emissions but is likely to suffer the most of any Continent. The immediate concern is for measures of 'adaption and mitigation'; as the Continent develops and inevitably uses a greater amount of energy the need to leapfrog into renewables and green development will become ever more pressing. The paper shows that such options are available and are likely most sustainable and least cost in the long run. The challenge is to obtain the required upfront financing in the near term.

The paper also shows that African cities are at the forefront in terms of being affected by shocks and stresses associated with the on-going climate emergency, and yet remain poorly prepared to manage these impacts. The lack of resilience in African cities is related to poor planning and management capacity in implementing resilience principles; rapid urbanization contributing to unplanned and informal settlements and an inability to keep pace with infrastructure funding and provision; and severe impacts of climate change. The consequences of these forces are magnified by the weak urban planning and management regimes within the fragile and evolving local and urban governance system. Yet the analysis also shows that approaches towards urban resilience are successfully evolving in some African cities, offering the prospect of appropriate and effective adaption and mitigation measures being more widely adopted across the Continent.

Recent urban development and climate change experiences in Africa provide successful examples initiatives supporting resilience and sustainable development. Policy documents, strategies and institutional frameworks exist (examples include the Ghana National Urban Policy, the National Climate Change Policy and National Climate Change Adaptation Strategy), and some municipalities (examples include Kumasi and Accra Metropolitan regions) are using land use planning and local community participation to achieve some level of resilience. Examples of innovative climate financing instruments accessible to local governments and city enterprises also exist. Yet, the fundamental barriers of limited planning capacity and institutions to undertake the required investment, and of inadequate funding and financing systems for urban climate investment remain.

There is thus a clear need for the AfDB to foster competent and effectively mandated demand side implementing agencies need to be assigned clear responsibility for the investments in "green" infrastructure, enterprise capital for RE and EE, cluster support systems & human capital development initially linked to COVID recovery but with increasing emphasis on implementation of NDCs as recovery proceeds. It also needs to work with national governments and financing institutions to bolster effective national climate finance systems.

It is also important that both supply and demand sides of the climate finance market are strengthened together as, for example, strengthening financial institutions will be of limited use if cities do not have the fiscal space or capacity to utilise the available finance. On both sides of the market and at both national and sub-national/ local levels, interventions need to address:

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<sup>24</sup> <https://www.afdb.org/en/cop25/climate-change-africa>

- Structural, enabling framework and regulatory issues;
- Operational issues; and
- Capacity building needs.

African city governments do not have all the resources they need to face the challenges and critical tasks of rapid urbanisation in the context of accelerating climate change: Staff capacity and access to all forms of financing must be improved. To that goal, AfDB needs to support African cities with:

- A clear focus on practical, effective solutions, both technical and financial, that cities can implement rapidly, leaving them more able to implement future projects themselves;
- An awareness of potential synergies and integration among project support, financing solutions and capacity-building; and
- An ability to tap into global networks of technical and financing resources, both public and private, to provide creative new solutions, especially in climate finance

Rather than the current scattershot “adopt-a-city” approach, AfDB should assist at scale the broad urban market including the hundreds of

smaller and medium-sized cities, not just the most iconic mega-cities already well-covered by donor technical assistance.

To achieve the above it is suggested that a dedicated climate finance facility to specifically address the climate investment and financing needs of African cities should be developed with a systematic approach to strengthening city systems and to supplying finance according to the needs of the city agencies or enterprises. The facility will need to be able to address the constraints and opportunities set out in Section 3 and to support the actions set out in Section 4 but specifically support:

- Project and program development;
- National financial institutions in bolstering their urban climate finance response;
- Links to appropriate technical solutions;
- Catalyst blended financing appropriate to a range of city types;
- Working with private sector investors where appropriate; and
- Knowledge development, peer-to-peer learning and capacity building.

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