



INVESTING IN URBAN RESILIENCE

Protecting and Promoting Development in a Changing World



GFDRR
Global Facility for Disaster Reduction and Recovery



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ACRONYMS

AAL	Average Annual Loss
APL	Adaptable Program Loan
AMS	Asset Management System
CDD	Community Driven Development
CFR	Code for Resilience
COP	Conference of the Parties
CAFF	Climate Adaptation Finance Facility
CAT-DDO	Development Policy Loans with Catastrophe Deferred Drawdown Option
CERC	Contingent Emergency Response Component
CIF	Climate Investment Funds
CPFS	Country Partnership Frameworks
CRW	Crisis Response Window
DBR	Doing Business Report
DPL	Development Policy Loan
DRM	Disaster Risk Management
ERL	Emergency Recovery Loan
EMDES	Emerging Markets and Developing Economies
ESMID	Efficient Securities Markets Institutional Development
GDP	Gross Domestic Product
GEMLOC	Global Emerging Markets Local Currency Bond Program
GFDRR	Global Facility for Disaster Reduction and Recovery
GSURR	Social, Urban, Rural and Resilience Global Practice, World Bank
GIF	Global Infrastructure Facility
GIIF	Global Index Insurance Facility
HFA	Hyogo Framework for Action
HIPC	Highly-Indebted Poor Countries
ICR	Inclusive Community Resilience

IDA	International Development Association
IDB	Inter-American Development Bank
IIED	International Institute for Environment and Development
IFC	International Finance Corporation
IFFIM	International Finance Facility for Immunization
IPF	Investment Project Finance
ODA	Official Development Assistance
MCUR	Medellin Collaboration for Urban Resilience
MCPP	Managed Co-Lending Portfolio Program
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
NHFO	Non-honoring Financial Obligation
NHSFO	Non-honoring Sovereign Financial Obligation
PFORR	Program for Results
PCF	Prototype Carbon Fund
PCG	Partial Credit Guarantees
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public Private Partnership
R2D2	Responding to Disasters Together
SCD	Systematic Country Diagnostic
SDGS	Sustainable Development Goals
SEC	Securities and Exchange Commission
SIDA	Swedish International Development Cooperation Agency
SIL	Specific Investment Loan
SISRI	Small Island States Resilience Initiative
SMES	Small-and medium-sized Enterprises
SNTA	Sub-national Technical Assistance Program
SSN	Social Safety Net
TA	Technical Assistance
WBG	World Bank Group



Executive Summary

Cities are the world's engines for economic growth, generating more than 80 percent of global GDP.¹ Strengthening urban resilience globally is a key element of sustainable development and in achieving the World Bank Group's twin goals of ending extreme poverty and boosting shared prosperity. In this report, resilience is defined as the ability of a system, entity, community, or person to adapt to a variety of changing conditions and to withstand shocks while still maintaining its essential functions (World Bank 2014a). Resilience is also about learning to live with the spectrum of risks that exist at the interface between people, the economy, and the environment (Zolli 2012). As the climate continues to change and the adverse impacts of disasters increase in cities which are housing a growing number

of the world's poor, developing resilient cities is becoming all the more critical. This report explores the rationale for increasing investment in the resilience of cities and their citizens to natural disasters and climate change, recognizing that doing so will also help them cope with a broader range of shocks and stresses. Failing to invest in city resilience threatens progress made in economic growth while gains already made in reducing poverty may be erased.

Increasingly, institutions like the World Bank Group have developed more effective ways to partner with city governments to eliminate poverty, mitigate and adapt to climate change and disasters as well as promote cities as engines for job creation and economic growth. However, meeting all

the resilience financing needs of cities in the developing world will require far more resources than exist amongst all multilateral development finance institutions combined. Significant need and opportunities exist for the private sector to invest in the resilience of cities globally. The World Bank Group has the tools, expertise and experience to enable and leverage private sector capital towards urban resilience investments.

Purpose and structure. The purpose of this report is to highlight the need and potential for investing in urban resilience in low and middle-income countries.² This will be achieved by:

- demonstrating why the international development community should care about making cities in the developing world more resilient (Chapter 1);
- understanding why shocks and stresses disproportionately affect the urban poor (Chapter 2);
- identifying financing needs and obstacles to be overcome (Chapter 3); and,
- setting out a vision for how the World Bank Group can facilitate more public and private sector investment in urban resilience (Chapter 4).

The audience for this report includes stakeholders in vulnerable cities in the developing world, potential investors in urban resilience as well as existing and future partners working on advancing resilience in cities



Why Do We Care About Urban Resilience?

In recent years, losses associated with natural events have increased considerably.

These trends are expected to become more pronounced as global population growth and rapid urbanization in the developing world threaten to reverse hard-won development gains. By 2030, 325 million extremely poor people³ will be living in the 49 countries that are most prone to hazards (Shepherd et al. 2013).

In parallel, the world is also rapidly urbanizing.

Urban areas are adding 1.4 million people per week (UN DESA 2014). Over 60 percent of the land projected to be urban by 2030 has yet to be developed (UNISDR 2015). Additionally, nearly 1 billion new housing units will need to be constructed to house the world's growing population by 2060 (Bilham 2009). Much of this growth will take place in the developing world, with 90 percent of urban growth through 2050 expected in sub-Saharan Africa and Asia (UN DESA 2014). Decisions about investments in urban infrastructure, buildings and land use taken now will have huge implications for development outcomes in the future, and can prove critical in preventing cities from being locked into unsustainable development pathways that will expose them to increasingly intense and frequent urban shocks and stresses.

People and assets in cities are increasingly exposed to hazards. As people and enterprises, with their assets, increasingly concentrate in cities, they become highly dependent on infrastructure networks, communications systems, supply chains, and utility connections for their well-being. Natural and manmade disruptions to these highly dependent and interconnected systems can have a catastrophic impact on a city's ability to meet the most basic needs of its citizens – and can, with cascading failure, become the Achilles heel of a highly efficient

and interrelated network. Rapid and unplanned urbanization is a particular driver of risk: development in high-risk areas, such as hillside slopes, floodplains, or subsiding land, is often uncontrolled, as the poor and the vulnerable settle in hazardous areas because they are more affordable. Often, these impacts are felt most in the countries least able to manage and adapt to increasing disaster vulnerability and changing conditions associated with climate change.

The adverse impacts of disasters and climate change are felt most acutely in cities. Cities are the drivers of economic development and social progress in developing countries but are also home to many of the world's poor. This concentration of wealth and vulnerability has its costs:

Growing economic cost of disasters: Global average annual losses (AAL) from disasters in the built environment are now estimated at USD 314 billion and can increase to USD 415 billion by 2030, due to investment requirements in urban infrastructure (UNISDR 2015a). And this is a low estimate, as it does not include the impact of threats beyond tropical cyclones, earthquakes, tsunamis, and floods such as social and economic shocks and stresses.

Disproportionate impact on the urban poor: Failure to invest in urban resilience can have significantly adverse impacts on the urban poor. Disasters and the effects of climate change, such as increased food prices, could reverse many development gains and force tens of millions of urban residents back into poverty.

Varying levels of impact: The impact of climate change will be experienced in different ways by different urban localities. Cities located along the world's tidal zones as well as in areas where land is already subsiding will be particularly affected. For example, the risk of sea-level rise and subsidence in the 136 largest coastal cities could result in losses

of USD 1 trillion or more per year by 2050 without further investment in adaptation and risk management (Hallegatte S. 2013).

Global Implications: Finally, the impact of local events can have global repercussions – crop failure in one corner of the world can lead to political instability in another, for example, while floods in a single city can disrupt supply chains of a key product globally.

But this pessimistic scenario is not inevitable.

Over the next 15 years, annual investments of USD 6 billion in appropriate disaster risk management strategies could generate total risk reduction benefits of USD 360 billion (UNISDR 2015a). If all countries implemented a “resilience package”, the gain in well-being would be equivalent to an increase in national income of billions per year. This package would consist of better financial inclusion, development of disaster risk and livelihood insurance, increased coverage of social protection and scalable safety nets, contingent finance and reserve funds, and universal access to early warning systems.

There is a window of opportunity for cities and investors alike to meet the challenge of urban resilience.

Proactively investing in resilience – prior to the occurrence of a catastrophic event – represents a strategic shift from past development trends whereby investments were largely mobilized towards recovery and reconstruction post-disaster. The international community has recently begun to recognize the importance of the urban resilience challenge, through such initiatives as the Sendai Framework on Disaster Risk Reduction (March 2015), the UN Sustainable Development Goals (September 2015), the 21st Climate Change Conference of the Parties (December 2015), and the New Urban Agenda (October 2016). In parallel, the World Bank Group has a mandate to invest in urban resilience through its Climate Change Action Plan, urban strategy and efforts to mainstream disaster risk management.

Why Resilience Matters to the Urban Poor

There is a growing awareness of the urban resilience-poverty linkages. Poverty is urbanizing and the urban poor, especially those in informal settlements, are increasingly faced with risks to their lives, health and livelihoods. More than 880 million urban residents were estimated to live in slums in 2014, an increase of 11 percent since 2000. Regionally, more than 30 percent of city residents in South Asia and nearly 60 percent in sub-Saharan Africa live in slums. (UN-Habitat, 2016b). Slums generally have lower levels of infrastructure and services and are more exposed to hazards of varying types. In addition, the majority of internally displaced people and refugees are increasingly settling in cities, and represent a special class of vulnerable people.

Risks faced by the urban poor relate to their limited economic base, location, low access to risk-reducing infrastructure and services as well as inadequate governance and disaster risk management. Firstly, the urban poor often cannot afford safe housing and lack assets to cope with shocks and stresses. Next, many poor neighborhoods are located in or close to hazardous zones which impose adverse costs on their residents. Thirdly, poor cities and communities are usually deficient in basic infrastructure and services that can substantially reduce exposure to natural and manmade hazards. In this sense, the resilience of the urban poor is heavily tied to the quality of governance and government capacity to properly plan and manage public infrastructure required to reduce the risks faced by their lower-income residents. Finally, disaster risk management requires that local governments engage with households and communities at risk, taking into account the specific concerns of the urban poor especially

Failure to invest in urban resilience can reverse development gains by sending millions back into poverty. Up to 77 million urban residents could fall back into poverty by 2030 in a likely scenario of high climate impacts and inequitable economic growth. This is a conservative estimate based on a USD 1.25 poverty line which is applied nationally and often understates urban poverty in cities. The primary drivers of increased urban poverty will be higher food prices and the costs associated with an increase in waterborne diseases. Most of the increase in urban poverty due to climate change will be concentrated in the cities and towns of South Asia and sub-Saharan Africa.

What Are the Needs for and Obstacles to Investing in Urban Resilience?

Significant financing is needed to invest in urban resilience. The global need for urban infrastructure investment amounts to USD 4.5 - 5.4 trillion per year, of which an estimated premium of 9-27 percent is required to make this infrastructure low-emissions and climate resilient (CCFLA 2015). A significant proportion of this demand is from cities in the developing world. For example, in sub-Saharan Africa, infrastructure spending needs (including capital and operations and maintenance) range from a high of 37 percent of GDP in fragile low-income countries to 10 percent in middle-income countries (Briceño-Garmendia et al, 2008).

However, major obstacles exist that deter mobilization of private capital towards new investment in urban resilience. The argument that cities in the developing world “just need access to global capital markets” to invest in resilience-increasing activities fails to recognize that many of these cities are constrained by other factors that reduce their access to credit for climate-adaptive or other urban infrastructure investments:

Lack of government capacity - Capacity constraints include: the inability to plan and implement resilience investments; inability to generate sufficient revenue to meet existing obligations and maintain on-going programs, adversely impacting their creditworthiness; national legal and regulatory systems that deter private investment; political uncertainty; and general challenges to infrastructure development.

Lack of private sector confidence - This is driven by some governance constraints (financial regulations and complexity, the policy environment including corruption, political uncertainty, absence of financeable proposals) as well as lack of data and standards to benchmark asset performance.

Challenges in project preparation - Limited government experience with project identification and preparation - and limited resources to commit to project preparation - means that the pipeline of well-developed, financeable urban infrastructure and resilience projects offered to investors is limited.

Financing challenges - The issues revolve around: dependence of cities on intergovernmental transfers, low capacity to raise revenues for investments as well as limited funding for local entrepreneurs and SMEs. Cities in the developing world also struggle to raise resources to fund their investment needs, and at times struggle to fund ongoing provision of public services, due to unfunded mandates, limited sources of locally generated revenue, and lack of creditworthiness.

The World Bank Group can help address these constraints and stimulate investment from private capital, institutional investors, donor aid and finance, sovereign wealth funds and other multilateral development banks. Support for overcoming obstacles includes technical assistance to subnational governments to

increase their own-source revenue, improve fiscal management, enhance creditworthiness, improve capital investment planning, and prepare investor-ready projects. The burden of risk mitigation is on a scale of magnitude beyond the capacity of the World Bank Group, or governments or cities, to carry alone. For this reason, in the case of infrastructure, for example, the World Bank Group can play a critical role in leveraging third-party financing at the downstream, midstream and upstream segments of the investment value chain. (Levy 2016). Downstream actions would include promoting positive change in the environment in which projects operate as well as improving dispute resolution mechanisms, promoting and developing local capacity for pre-development financing, risk reduction and risk-sharing measures as well as standardizing and sharing project information through data platforms or hubs. Midstream actions could entail improving the financial performance of investments, funding the incremental costs of resilience, and encouraging the use of innovative financing techniques which source from diverse financial resources (e.g. guarantees, commercial finance and refinance, pension and sovereign wealth funds). Upstream, beneficial work would entail providing support to embed climate risks and adaptation in 'traditional' infrastructure projects through more sophisticated planning or developing and disseminating tools such as fixed-income infrastructure indexes, while understanding the regulatory constraints and fiduciary responsibilities of asset managers and their principals. Initial results are promising: every dollar spent by the MDBs in climate-related investments has leveraged three dollars of private finance.

How Can the World Bank Group Help Make Cities and the Urban Poor More Resilient?

With its depth of experience, extensive in-house financial and technical expertise and unique convening power, the World Bank Group has the capacity to scale up urban resilience investment globally. The Bank has worked in more than 7000 cities and towns across 130 countries, committing over USD 50 billion through more than 900 projects with climate-related activities over the past five years and investing over USD 5 billion annually in disaster risk management. Core investment in urban resilience has averaged almost USD 2 billion per year over the last five years for a portfolio of 79 projects in 41 countries (see Annex 2). Finally, the World Bank Group has demonstrated increased capacity to work across sectors, working with partners from private investors to national and subnational governments who understand the scale and timeframe of the challenges faced. In this role, the Bank supports improved policy environments, leverages resources, and draws on global knowledge – all of which are critical to helping city governments identify, prepare and implement investments in urban resilience.

The World Bank Group has the powerful financing products and services to help cities and the urban poor become more resilient. The Bank's current urban strategy is built around five thematic areas, one of which is making pro-poor policies a city priority. The World Bank Group can further help leverage the private capital required through a suite of existing instruments that identify risks, provide mitigation solutions and facilitate investment at the household, community, city, and national levels. These instruments are complemented with services to support urban resilience, such as analytical tools and methods, frameworks for policy dialogue and reform, and procedures

for working across sectors (see Annex 3). Importantly, as investing in urban resilience not only requires significant amounts of capital but also forward-thinking, long-term planning, the WBG (along with other multilateral development finance institutions) is uniquely positioned to support visionary city leadership with the needed financial and technical support which can span not only years, but also decades.

There are concrete opportunities to scale up investments in urban resilience. Private sector financing can be leveraged through a strategic expansion of co-financing, lending, guarantees and other risk management instruments, and through concessional financing. A scaled-up Resilient Cities Program aims to benefit a billion people over the next two decades, crowding in USD 500 billion in private capital to finance resilience in 500 cities and enable 50 million people to escape from poverty. The Program would support more than 400 World Bank task teams that engage with cities to better respond to demand for investment in urban resilience. This will be complemented by work in cities that is supported by the World Bank Group's Climate Change Action Plan. The Bank has pursued over a dozen external and internal partnerships that will be fundamental to achieving these ambitious objectives (see Annex 4). By making urban resilience a formal business line, the World Bank Group can scale up its ability to provide financing, leverage resources from the public and private sectors, support better policies, strengthen partnerships, and develop and share the knowledge needed to make cities and the urban poor more resilient.

CHAPTER

01

Why Do We Care about Urban Resilience?

INVESTING IN URBAN RESILIENCE

18



1.1 – DEFINING URBAN RESILIENCE

Urban resilience has many definitions most of which take into account the ability to manage the wide range of shocks and stresses which may occur in a city. There is no standard definition, however, and a sample of existing definitions is provided in Annex 1. This report defines resilience as the ability of a system, entity, community, or person to adapt to a variety of changing conditions and to withstand shocks while still maintaining its essential functions (World Bank 2014a). Notably, resilience refers to the ability of a system to maintain or quickly return to desired functionality following a

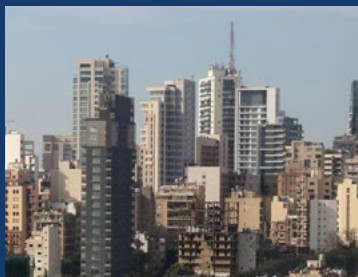
transforming systems which inhibit current or future adaptive capacity. Synergies and trade-offs must also be considered in order to identify

Investing in resilience contributes to long-term sustainability by ensuring current development gains are safeguarded for future generations.

“win-win” situations that reduce the possibility of loss and increase potential benefits (World Bank 2014a).² Beirut provides an example of this approach to urban resilience (see Box 1.1).

Box 1.1: Facing a Broad Set of Shocks and Stresses in Beirut

Home to more than half of Lebanon’s population, Beirut is growing rapidly while fostering a strong and vibrant private sector. In parallel, the city faces a growing spectrum of risks stemming from climate change, natural hazards (i.e.



flooding, severe earthquake and subsequent tsunامي), refugees and mass migration, and poor air quality, amongst others. Recurrent social, economic, and political shocks further challenge the sustainable development of the city.

In response, the Beirut City Council has launched the City Resilience Project for Beirut with support from the World Bank. This project will develop a master plan needed to make the city more resilient to current and future challenges and will serve as the first step in its commitment to implement a series of multi-sectoral initiatives and support an effective enhancement of the city’s resilience.

Launched in December 2015, the project will (1) conduct comprehensive city diagnostics to identify the range of shocks and stresses faced by the city and analyze its capacity to mitigate and respond to them in the event of a disaster; (2) develop an integrated implementation strategy which will identify a set of interlinked short- and long-term multi-sectoral strategies; and, (3) initiate a capacity-building program by engaging key city stakeholders and preparing an awareness-raising strategy.

Source: (World Bank 2016i)

disruptive event (either natural or human-induced), which may not be predictable. It incorporates the ability to avoid shocks and to manage risks, while being able to constantly adapt to change when needed and quickly

Urban resilience is a critical element of sustainable development. Investing in resilience contributes to long-term sustainability by ensuring current development gains are safeguarded for future generations. Resilience focuses especially on learning to prepare for,

adapt to, and respond to the spectrum of risks that exist at the interface between people, the economy, and the environment (World Bank 2014a, Zolli 2012). At the same time, investing in resilience is not a substitute for broader

Climate change is expected to increase the intensity and frequency of existing hazards.

approaches to sustainability. For example, it does not provide the insights into social sustainability that are gained through the social science concepts of agency, conflict, knowledge, and power (Olsson et al. 2015). Given the mandate of the World Bank, issues of sustainability and resilience in this report are primarily focused on cities of low- and middle-income countries.

Resilience has often been associated with the capacity of communities to withstand the impacts of climate change and disasters, which represent the major development challenges of our time.

As climate change and disasters have documented and measurable negative impacts on cities, climate change adaptation and disaster risk management have come to represent the core of the overall urban resilience agenda. This is especially the case as climate change is expected to increase the intensity and frequency of existing hazards. In more recent years, the definition of resilience has broadened to include key aspects involving not only natural hazards, but also technological, social, economic, political and cultural shocks and stresses (see Table 1.1 below). Select experiences, lessons and solutions from climate change adaptation and disaster risk management activities may be adapted and applied to the other hazards detailed below (and vice versa).

Table 1.1: Classification of Urban Hazards

Natural	Technological	Socioeconomic
Drought Earthquake Epidemic/pandemic Extreme temperature Flooding Insect infestation Severe storm Tsunami Volcanic eruption Wildfire	Building collapse Chemical spills Cyber threats Explosion Fire Gas leak Industrial accident Oil spill Pollution event Poisoning Radiation Transport accident System breakdown (e.g. ICT, water and sanitation, energy, health, education, etc.)	Business discontinuity Corruption Demographic shifts Economic crisis High unemployment Labor strike/unrest Massacre Political conflict Social conflict Supply crises (e.g. food, water, housing, energy, etc.) Terrorism War

Source: Adapted from UN-Habitat's City Resilience Profiling Tool and based on classification of hazards by EM-DAT and PreventionWeb

The disproportionate impact of urban shocks and stresses on a city's low-income population and informal settlements is clearly apparent.

A growing literature is drawing attention to the lack of resilience amongst the urban poor. Poor people are disproportionately affected by shocks and stresses – not only because they are frequently more exposed (and subsequently more vulnerable) to climate-related shocks, but also because they have fewer resources and receive less support to prevent, cope with, and adapt to them. Climate change is expected to intensify these shocks and stresses and further hinder efforts to reduce poverty (Hallegatte, et al. 2015). The importance of resilience for the urban poor is explored in greater depth in Chapter 2.

Resilience should be measured on different scales – from the individual and household, to the community, municipal and national levels. Prescriptive actions will also differ according to these scales. At the individual and household levels, for example, resilience would include the capacity to take action to manage stresses and avoid the impact of shocks (e.g. living in safe households or locations protected



by risk reducing infrastructure); to take action before the occurrence of a shock; to cope with the impact when it does occur; and to bounce back or progress to a more resilient state. At the community level, in addition to these, resilience includes the capacity to work together to manage a stress or avoid a shock. At the city level, resilience entails the capacity

of municipal governments to take measures to enable households, communities and enterprises to manage a stress or avoid a shock, and to maintain critical services following an adverse event (e.g. getting services up and running following a disruption, repairing damages to infrastructure). At the regional and national level, key actions – whether policy reforms,

Poor people are disproportionately affected by shocks and stresses.

investments, or financial protection strategies – can be pursued to enhance urban resilience in a specific city, vulnerable area or set of cities.

Resilience must also consider cities as complex systems. Any approach to urban resilience must take into account the functional (e.g. municipal revenue generation), organizational (e.g. governance and leadership), physical (e.g. infrastructure), and spatial (e.g. urban design) dimensions, which are interrelated. Urban shocks follow a disruption or breakdown of individual or multiple parts of the urban system, whether economic recession, social upheaval, epidemics, or a failure of governance to deal with inefficiencies of the system. Resilience strategies and investments need to consider these underlying relationships across multiple sectors (UN-Habitat, UNEP and UNISDR 2015).

The scope of urban resilience often extends beyond the administrative boundaries of a single municipality due to regional, national and global factors. A focus on overall resilience capacity rather than on only risk management and adaptation stems from a recognition that a city's functionality depends on goods and services (including ecosystem services) originating from beyond its own administrative boundaries. This draws attention to regional,

Rapid urbanization and increasing exposure to hazards threaten to drive the risk of stresses and shocks to dangerous and unpredictable levels with systemic global impacts.

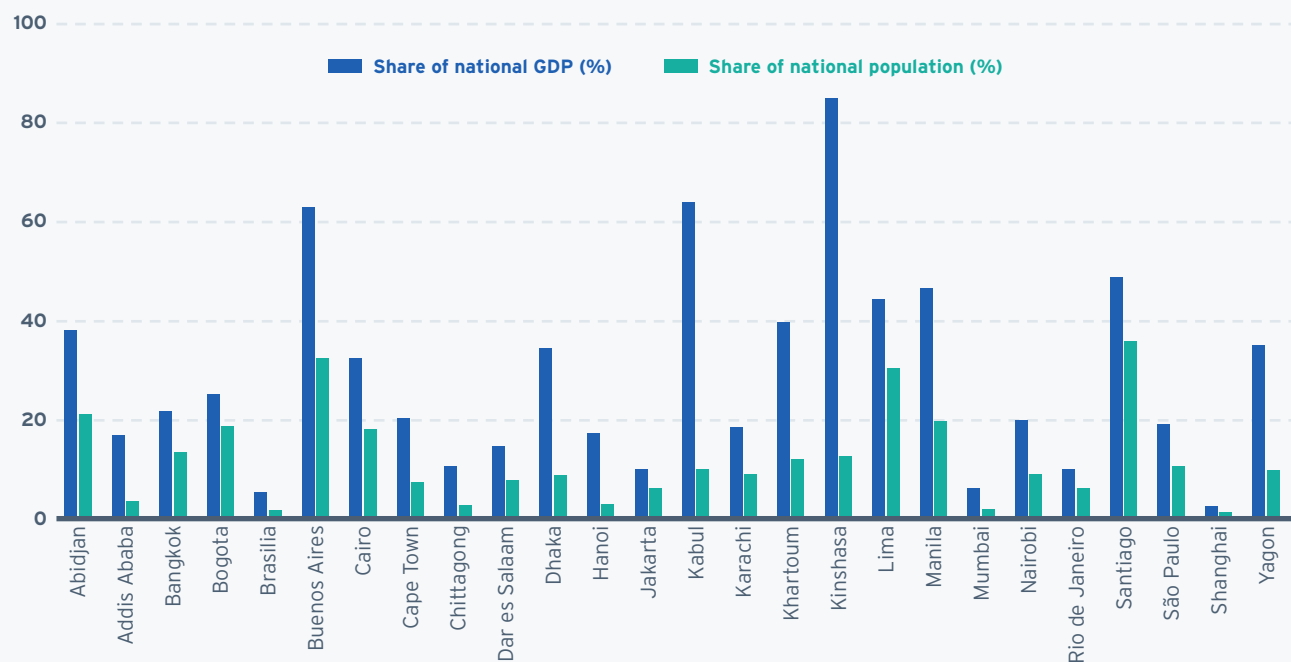
national and global supply chains and financial flows as well as the socio-economic-political-cultural crises which originate from outside a city and thus the jurisdiction of its government. For example, a city's water, food and energy resources are generally supplied from beyond a city's administrative boundaries, and this should be taken into account when considering its resilience. Similarly, safeguarding against floods entails not only flood protection works within a city but also effective watershed management, which is often upstream of a city's jurisdiction. In addition, a city's resource consumption patterns have upstream consequences while its emissions of waste have downstream impacts. Examples of inter-connections, such as these therefore demonstrate the exposure of a city to events beyond its borders.

1.2 WHY IS IT URGENT TO INVEST IN URBAN RESILIENCE

Investing in urban resilience is critical in achieving sustainable development as well as the World Bank Group's twin goals of ending extreme poverty and promoting shared prosperity by 2030. Rapid urbanization and increasing exposure to hazards threaten to drive the risk of stresses and shocks to dangerous and unpredictable levels with systemic global impacts. In the built environment, global expected average annual loss (AAL) associated with earthquakes, floods, tsunamis, storm surges, and wind from tropical cyclones is now estimated at USD 314 billion (UNISDR 2015a). A recent projection states that 325 million extremely poor people will be living in the 49 countries most prone to hazards by 2030 (Shepherd, et al. 2013). Since many of these poor and vulnerable people will be living in urban environments, eliminating poverty and safeguarding development gains cannot be achieved without addressing disaster impacts and climate events in urban settings.



Figure 1.1: Share of national population and GDP in selected developing cities



Source: UN-Habitat, 2011

Rapid urbanization

The world is rapidly urbanizing, with up to 1.4 million people per week moving into urban areas. Unprecedented urbanization has transformed the planet from 30 percent urban in 1950 to over 54 percent urban today, and this will reach an estimated 66 percent by 2050. Over 60 percent of the land projected to become urban by 2030 has yet to be developed. (UNISDR 2015a). And nearly 1 billion new housing units will need to be constructed to house the world's growing population by 2060 (Bilham 2009). Currently, the majority of the world's 3.9 billion urban dwellers reside in developing countries, where most future urban growth is also expected (UN DESA 2014).

A significant portion of new urban expansion will occur in South Asia and sub-Saharan Africa. In India alone, the number of urban dwellers is expected to increase by 404 million over the next 35 years, with nearly 50 percent of

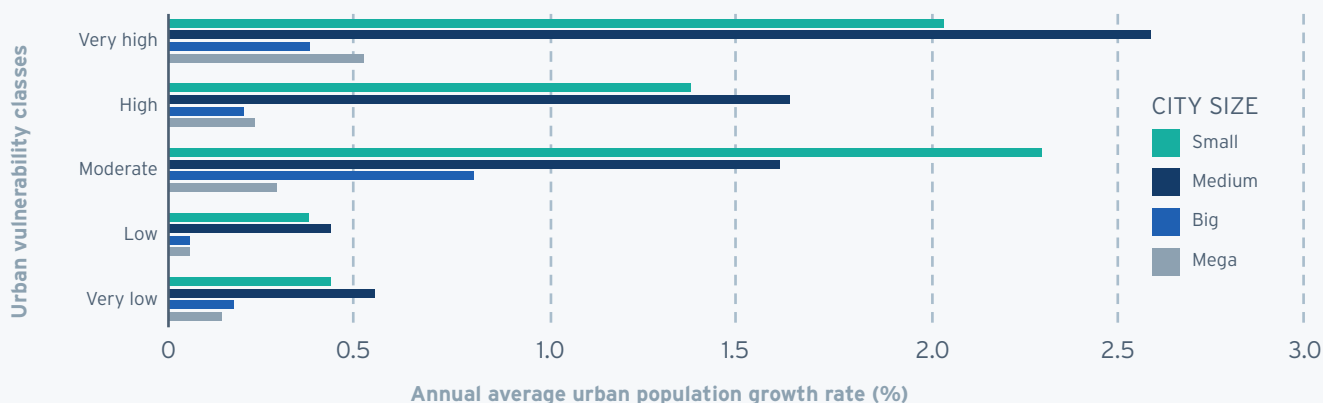
Unprecedented urbanization has transformed the planet from 30 percent urban in 1950 to over 54 percent urban today, and this will reach an estimated 66 percent by 2050.

the country's population living in cities by 2050. In sub-Saharan Africa, similar growth rates will result in 56 percent of the region's population living in urban areas by 2050, compared to 40 percent today (UN DESA 2014). As cities grow and grapple with uncertainties and challenges like climate change, it is becoming increasingly urgent for municipalities and their partners to address urban resilience (Carmin 2012).

Some of the fastest urban growth in the developing world will be experienced in small and medium-sized cities.³ By some estimates, populations are expected to rise by more than 32

Figure 1.2: City growth rates by level of vulnerability and city size

City growth rates, according to relative vulnerability and proportion of urban population (2000-15)



*Vulnerability is measured by the Urban Vulnerability Index in five classes (very low to very high). Source: Birkmann et al, 2016

The greatest opportunity lies in effectively addressing the interplay between risks and urban development in a manner that enables better management of current challenges while accounting for future scenarios.

percent between 2015 and 2030 – equivalent to 469 million more residents (Birkmann 2016). In Asia and elsewhere, rapidly developing second- and third-tier cities already face a daily struggle to deliver infrastructure and services to both new and existing settlements, given limited institutional capacities and constrained finances. Yet it is these cities that still have major investment, land and planning decisions ahead of them. Here, the greatest opportunity lies in effectively addressing the interplay between risks and urban development in a manner that enables better management of current challenges while accounting for future scenarios (Brown, Dayal and Rio 2012).

Growing concentration of economic activity in cities

In low- and middle-income countries, rapid urbanization is generally associated with rapid economic growth. This, in turn, leads to a higher concentration of people, assets and economic activity in urban environments.⁴ Cities in the developing world often account for a much greater share of GDP than of the national population (see Figure 1.1).

But a city's economic success does not necessarily lead to greater resilience. Many rapidly growing cities have neither the required infrastructure and services nor the risk-informed planning and land use management measures in place required to safeguard all their inhabitants, assets and activities. Similarly, an economically successful city does not equate to a healthy, inclusive or sustainable city. In many low- and middle-income countries, cities are usually characterized by unequal access to urban space, infrastructure, services, and security. This generates new patterns of risk, particularly in informal settlements, with deficient or non-existent infrastructure and social protection and high levels of environmental degradation.

Increasing exposure of people and assets to climate change and disaster impacts

The growing exposure of cities to natural and man-made hazards represents a real challenge to the global sustainable development agenda.

Increasing climate and disaster risks, together with poverty and inequality, undermine sustainable urban development. A significant portion of developing country cities considered to be in a “very high” urban vulnerability class are small- and medium-sized cities growing at an annual average rate of approximately 2 percent and 2.6 percent, respectively (see Figure 1.2).

The scale of population growth in most towns and cities has overwhelmed the capacity of many municipal governments. Larger and more densely populated cities mean not only that more people and assets are exposed to hazards, but also that the characteristics of the urban ecological system or environment are changed, potentially increasing the level of disaster risk (GFDRR 2016, Donner and Rodriguez 2008). People and assets are exposed to climate change and disasters in a number of key dimensions:

Urban lives and livelihoods

Shocks impact all aspects of development and are felt directly through the loss of lives, livelihoods, and infrastructure, and indirectly through the diversion of funds from development to emergency relief and reconstruction (DFID 2004, World Bank 2014a). A recent risk analysis of 616 major metropolitan areas – home to 1.7 billion people, or nearly 25 percent of the world’s total population, and generating approximately half of the global GDP – found that flood risk threatens more people than any other natural hazard. River flooding poses a threat to over 379 million urban residents, with earthquakes and strong winds potentially affecting 283 million and 157 million, respectively (Swiss Re 2014). As elaborated in the next chapter, the urban poor are more likely to be impacted as they are

more likely to live in hazard-prone areas and have less financial capacity to proactively invest in risk-reducing measures. A lack of insurance

An economically successful city does not equate to a healthy, inclusive or sustainable city.

coverage and social protection mechanisms further hinders their capacity to cope with the impacts of climate change and disasters.

Urban systems

As more people, with their assets, move to cities, they become highly dependent on infrastructure networks, communications systems, and urban service delivery for their well-being. With sea-level rise, changing rainfall patterns, more intense storms, increasing temperatures and other climate-related shocks and stresses, a broad spectrum of interdependent effects on people and infrastructure results. The vulnerability of the urban systems as a whole is increased by urban development in high-risk areas where the

Shocks impact all aspects of development and are felt directly through the loss of lives, livelihoods, and infrastructure.

urban poor can afford to live (e.g. hillside slopes, flood plains, or subsiding land) (Jha, Bloch and Lamond 2013). The construction of infrastructure to connect these high-risk areas further adds to the vulnerability of the urban systems as a whole.

Global supply chains

With the globalization of the world economy and increased reliance on global supply chains, a disaster in one city or region can impact another



city or region. Risk itself becomes globalized as both the causes and impacts are increasingly interconnected and affect other sectors. This is especially the case with foreign investments flowing into cities offering comparative advantages (e.g. lower labor costs, closer proximity to export markets), but also higher levels of vulnerability to shocks and stresses due to lower levels of investment in risk-reducing infrastructure. Investment decision-making is rarely able to take the hazard level in these locations into account, and large volumes of capital continue to flow into hazard-prone cities, leading to significant increases in the value of exposed economic assets (UNISDR 2015a)⁵. An example of this was the disruption of global supply chains for hard drives following floods in Thailand and for automobiles after the Tohoku earthquake and tsunami in Japan. Understanding these linkages, flashpoints, and potential chokepoints are essential when considering enhancing urban resilience (World Bank 2014a).

Risk itself becomes globalized as both the causes and impacts are increasingly interconnected and affect other sectors.

Increase in Expected Losses in Urban Environments

Global average annual losses (AAL) from disasters in the built environment are now estimated at USD 314 billion and can increase to USD 415 billion by 2030. This figure is only for disaster impacts, and underestimates the economic consequences of inadequate resilience because: a) damages and losses from other hazards are not included (e.g. conflict, pollution, congestion, epidemics, accidents, building collapses, and terrorism) and b) the assessment does not include economic impacts on the informal economy.

However, this growth in expected losses is not inevitable. Annual investments of USD 6 billion in appropriate disaster risk management strategies could generate risk reduction benefits of USD 360 billion over 15 years. This is equivalent to an annual reduction of expected losses by more than 80 percent. Such an annual investment in disaster risk reduction represents only 0.1 percent of the USD 6 trillion per year that will have to be invested in infrastructure over the next 15 years (UNISDR 2015a). However, for many countries, that small additional investment could make a crucial difference in achieving the national and international goals of ending

Figure 1.3: Economic losses relative to GDP by income group, 1990-2013



Source: UNISDR with data from EM-DAT and the World Bank

poverty, improving health and education outcomes, and ensuring sustainable and equitable growth. For example, in Ethiopia, an investment of USD 10 million in improving compliance with building regulations in cities could result in a net reduction of losses of USD 600 million through 2050 (World Bank 2016a).

Increasing disaster loss and impacts, magnified by climate change, will undermine the capacity of many low and middle-income countries to make the financial investments and social expenditures necessary to achieve the Sustainable Development Goals (SDGs).

These losses also represent a serious erosion of public investment in countries with the least capacity to invest (see Figure 1.3). In Madagascar, for example, the average historical annual losses from disasters since 2001 are equivalent to around 75 per cent of annual average public investment in the same period⁶. Investing in climate change adaptation and disaster risk reduction is thus a critical precondition for promoting sustainable development.

Increasing resilience is good economics.

According to a recent World Bank report, if all countries implemented a “resilience package,” the gain in well-being would be equivalent to an increase in national income of USD 100 billion per year. This package would consist of better financial inclusion, development of disaster risk and health insurance, increased coverage of social protection and scalable safety nets, contingent finance and reserve funds, and universal access to early warning systems (World Bank 2016c).

If all countries implemented a “resilience package,” the gain in well-being would be equivalent to an increase in national income of USD 100 billion per year.

1.3 INCREASING INTERNATIONAL FOCUS ON URBAN RESILIENCE

Investing in urban resilience is critical to ending extreme poverty by 2030 and promoting shared prosperity. Poverty-focused urban resilience investments, as discussed in Chapter 3, promote these goals by:

- protecting development gains so that urban residents do not fall back into poverty after facing shocks and stresses;
- making poor households and communities more resilient, and thus, in a better position to move out of poverty; and
- strengthening urban economies that can grow with equity.

WBG aims to better integrate climate into urban development projects.

Despite their geographic spread, the urban poor face common challenges.⁷ Addressing extreme poverty and promoting shared prosperity will require solutions to these challenges – and these solutions are inextricably bound to the issue of urban resilience.

Linkages to the broader World Bank Group agenda

Importantly, investing in urban resilience is fully aligned with the broader World Bank Group agenda.

Post-2015 Financing for Development: Multilateral Development Finance

During the April 18, 2015, Development Committee meeting, participants which included all the major MDBs,⁸ identified their institutions as being uniquely positioned to serve as innovators and co-investors, as well as honest brokers between public and private

actors to leverage and crowd-in essential private finance and investment to support government efforts in strengthening investment climates toward achieving the SDGs. MDBs can support governments in designing and implementing climate actions that generate resilience co-benefits through project preparation support and pooled vehicles, as well as credit enhancement and risk mitigation, which will be further discussed in Chapter 4.

WBG Climate Change Action Plan

Investing in urban resilience is identified as a key contribution to the World Bank Group Climate Change Action Plan's **Priority 2: Leverage Resources** and **Priority 3: Scale up Climate Action**. "Sustainable and Resilient Cities" is identified as a priority theme, as it is an area where:

- transformation is imperative in order to meet client and global climate goals;
- the WBG has a comparative advantage, a successful track record and can make a difference; and
- client demand and appropriate market conditions have already been observed in many countries and regions.

As part of its work to promote this theme, the WBG aims to better integrate climate into urban development projects and to promote multi-sectoral approaches to integrating infrastructure development, land use planning, disaster risk management, institutions/governance, social components, and infrastructure investment. Importantly, investing in urban resilience provides significant amounts of climate co-benefits in multiple sectors.

WBG Urban Strategy

Through its lending and technical assistance in urban areas, the World Bank Group aims to build sustainable communities, end extreme poverty and boost shared prosperity by supporting urbanization that is green, inclusive, well-governed, resilient, and competitive.



Key thematic areas of work include:

- low-income communities and housing;
- urban strategy and analytics;
- city management, governance and financing;
- sustainable infrastructure and services; and
- resilience and disaster risk management.

**World Bank Group Progress Report on
Mainstreaming Disaster Risk Management
in World Bank Group Operations**

Resilience has increasingly become a priority theme in country partnership strategies at the World Bank Group, and this is reflected in policies and investments in the most recent IDA17 round (Fiscal Year 2015 - 2017). To this end, an assessment of climate and disaster risks has been included in all new IDA Country Partnership Frameworks (CPFs) prepared during this period, ensuring that resilience is embedded in sectoral projects - including those focused on urban development. Some of the more innovative project areas range from early warning systems to post-disaster social safety nets as well as disaster risk financing and insurance. The general opportunities identified for further mainstreaming disaster risk management in project operations include:

- Strengthening DRM tools and expanding financial solutions for fast-growing cities in the context of rapid urbanization, population growth and climate change;
- Working with the private sector to address gaps in risk financing and enabling countries to transfer risk to markets through the intermediation of risk management transactions; and
- Working with the humanitarian community to address some of the most pressing needs.

Linkages to global mandates

A series of recent global mandates has propelled urban resilience as top priority amongst development practitioners - from the local to the global. The prioritization is a reflection of growing consensus amongst national governments, civil society organizations, donors, international organizations and

Resilience has increasingly become a priority theme in country partnership strategies at the World Bank Group.

the private sector on the need to ramp up efforts in strengthening urban resilience across the developing world. The following global mandates reflect this increased importance placed on urban resilience:

United Nations Sustainable Development Goals (SDGs, 2016-2030).

SDG No. 11 calls on the world to “make cities inclusive, safe, resilient and sustainable.” To this end, two main target action items have been identified:

- Substantially increasing the number of cities and human settlements that adopt and implement integrated policies and plans towards resilience (including holistic disaster risk management at all levels) by 2020;
- Taking actions to significantly reduce the number of deaths, the number of people affected and the direct economic losses caused by disasters, with a focus on protecting the poor and other people in vulnerable situations.

Related to these are the United Nations Development Goals, particularly UN SDG 1.5, which aims to “build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate related extreme events and other economic,

Investment decisions taken now will have huge implications for development trajectories in the future and will prove critical in preventing cities from being locked into unsustainable development pathways.

social and environmental shocks and disasters” and UN SDG 9, which seeks to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.”

Sendai Framework for Disaster Risk Reduction (2015 - 2030)

At the Third United Nations World Conference on Disaster Risk Reduction (Sendai, 14-18 March 2015), a new global framework was generated, serving as the successor to the Hyogo Framework for Action (HFA). The Sendai Framework calls for efforts to reduce exposure and vulnerability in general, while identifying unplanned and rapid urbanization as key underlying drivers of disaster risk. To this end, the Framework calls for integrating hazard and risk considerations in all stages of the urban development cycle, including the investments made by multilateral and bilateral development assistance programs. Within the framework, international financial institutions such as the World Bank Group committed to increasing investments in disaster risk management and resilience, while systematically working to incorporate disaster and climate risk into its operations.

United Nations Climate Change Conference of the Parties (COP21, December 2015)

During the Conference of Parties, participants emphasized the key role that urban areas play, in mitigating emissions and in adapting to climate change. This is part of the wider

dialogue on climate risk serving as the main driver of losses from natural disasters; more than 75 percent of disaster losses are related to extreme weather (Hoepple 2016). It was concluded at COP21 that curbing climate change and efficiently funding adaptation efforts would be essential to the resilience agenda.

New Urban Agenda (Habitat III, October 2016)

The New Urban Agenda to be adopted at the Habitat III Conference envisages cities that “adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and man-made hazards, and foster mitigation and adaptation to climate change” (UN Habitat 2016). One of the three pillars of the Quito Implementation Plan for the New Urban Agenda is entitled “Environmentally Sustainable and Resilient Urban Development” and calls for, inter alia, resilient urban spatial development, infrastructure and building design, reduction of vulnerability to hazards, proactive use of risk-based approaches, and climate adaptation in cities.

The issue of urban resilience is one of increasing urgency for the World Bank Group and is fully aligned with the development objectives of the broader development community. Investment decisions taken now will have huge implications for development trajectories in the future and will prove critical in preventing cities from being locked into unsustainable development pathways, or being exposed to increasingly intense and frequent urban shocks and stresses. In the next chapter, we will explore resilience as a priority for the urban poor and the growing and dynamic cities they call home.

CHAPTER

02

Why Urban Resilience Matters to the Urban Poor

INVESTING IN URBAN RESILIENCE

32



2.1 THE INCREASING URBANIZATION OF POVERTY

Poverty is increasingly urban. Globally, there is both an increase in the number of people facing poverty who live in cities and an increase in the proportion of the world's poor in urban areas. Case studies for particular cities or for nations' urban populations provide evidence that the scale of urban poverty or aspects of poverty has increased, or that the proportion of the population in poverty has grown. For example, documentation suggests that the proportion of the urban population with water piped to premises did not increase from 1990 to 2015 (WHO/UNICEF 2015) – and in fact went backwards in many nations (Satterthwaite 2016).

Informal settlements around city peripheries and other non-urbanized areas are expanding.

The expansion of informal settlements can create patterns of sprawl to which it is difficult and expensive to extend risk-reducing infrastructure and services (Hardoy et al 2001, Carruthers and Ulfarsson, 2003). It may also create new environmental and health risks for a city – for instance, informal settlements in watersheds increase exposure to flooding both within these settlements and for urban areas downstream. Urbanization can also contribute to changing precipitation and temperature patterns within the city region (Seto et al. 2011; Linard et al, 2013).

A growing number of urban residents are living in slums. UN-Habitat statistics show that globally the percentage of the urban population living in slums has decreased steadily in most regions from 1990 to 2014, with the exception of Western Asia. However, the numbers have increased. Globally, more than 880 million urban residents were estimated to live in slums in 2014, an increase of 11 percent since 2000. Regionally, more than 30 percent of city residents in South Asia and nearly 60 percent in sub-Saharan Africa live in slums. (UN-Habitat, 2016b).

Displaced people and refugees are increasingly settling in cities. Many cities already facing systemic challenges to the delivery of basic services, security, and welfare now also have large and often growing populations of refugees and/or the internally displaced to contend with. Estimates suggest there are at least 19 million¹⁰ internally displaced persons and more than 10 million refugees living in urban areas globally (Global Alliance for Urban Crises 2016). Both groups are often excluded from access to services, for a number of reasons. For example, without official status, refugees frequently face language barriers and difficulties in earning adequate incomes. Many live with host populations that are themselves in poor quality housing without adequate services. The targeted support refugees may receive can create tensions with these hosts. In addition, extraordinary influxes and outflows caused by crises – for example war or natural disaster – can reshape cities and stretch the absorption capacity of host communities and existing urban services and infrastructure. Thus, the urbanized displaced people become part of the urban poor or face many of the same resilience challenges.

Estimates suggest there are at least 19 million internally displaced persons and more than 10 million refugees living in urban areas globally.

2.2 FACTORS THAT INCREASE THE RISKS FACED BY THE URBAN POOR

The urban poor face risks to health, income and livelihoods and to sudden increases in costs or decreases in income. These risks range from eviction to natural disaster. Some are constant or everyday, some are frequent (e.g. seasonal) and some are present rarely but may have major consequences.

Incomes may in fact be so low for some that they can afford no accommodation at all - as with those living on pavements or construction workers sleeping on site.

A growing literature points to a range of factors that create or exacerbate these risks for low income urban dwellers. Some of the major factors increasing the vulnerability of the urban poor to risk, include those that relate to:

- individuals' and households' limited economic base including inadequate and often irregular incomes and lack of assets;
- local contexts with dangerous livelihoods, housing, fuel use, and house sites;
- lack of or deficiencies in infrastructure and services (deficits in provision often exacerbated by rapid population growth);
- inadequacies in local governance that help explain the deficiencies in infrastructure and service provision and that include lack of voice for low income groups and local government accountability;
- lack of attention to disaster risk reduction, including knowledge among those at risk as to how to reduce risk, cope with it and adapt

Limited economic base

Beyond the daily challenges associated with poverty, a limited economic base prevents families from achieving stability in several ways:

Limited ability to invest in housing. One consequence of having a low income is a limit on what can be spent on housing. Incomes may in fact be so low for some that they can afford no accommodation at all - as with those living on pavements or construction workers sleeping on site. Similarly, a lack of tenure security amongst urban dwellers either occupying land without title or on land not permitted to be sub-divided can hinder efforts and sometimes even disincentivize individuals from securing financing for renovation.

Lack of access to credit for housing finance.

Low or irregular incomes usually preclude access to credit to invest in improved housing conditions. This is exacerbated by the monetization of the informal housing market. In the past, in many cities, there was some scope for low-income groups to illegally occupy land for which they did not pay - but in most city contexts, informal settlements develop within monetized land markets, some of them illegal and in many of which land developers and landlords operate.

No "buffer" of assets against shocks and stresses.

Most of the people in informal settlements lack assets or other means to cope with shocks or stresses. They may also have less access to assistance before and support after a disaster, either because they are not 'legal' residents, or because they are not informed about or otherwise able to navigate social services. Most also face insecure tenure, because they rent accommodation, or because residents of the settlement are at risk from eviction - or both.

Location

One of the greatest challenges facing the urban poor is the range of hazards that are endemic to the areas where they are forced to settle. These include:

Dangerous or disaster-prone areas. Many poor neighborhoods are located in or close to risk-prone areas, imposing severe social and economic costs on urban populations. One common feature amid the widely diverse cities of the developing world, is that low-income groups are often concentrated in informal settlements on dangerous sites (Hardoy, Mitlin and Satterthwaite 2001, Hope 2009, Silva 2012, Baker 2012). Residents accept these risks because accommodation is cheaper here, because of access to income-earning opportunities or because they do not want to leave a settlement that they have invested in. These sites are also usually ones that are facing greater risks from climate change (Revi, et al. 2014).

A lack of planning by cities for disasters in these areas. These impacts are inadequately planned for by authorities and disproportionately felt by the urban poor. Exposure to shocks and stresses is linked in large part to urban land pressures and exclusionary urban planning systems (Hallegatte, et al. 2015). City

Low or irregular incomes usually preclude access to credit to invest in improved housing conditions.

governments find it difficult to manage land use on the periphery to avoid either urban sprawl or informal development in hazardous zones; moreover, integrated land management relating to watersheds may be outside their jurisdiction.¹¹

Hazards vary from location to location and are difficult to anticipate. Within and around a city, risk types and levels for informal settlements vary. The connection between high risk and low cost can be seen within informal settlements

Many poor neighborhoods are located in or close to risk-prone areas, imposing severe social and economic costs on urban populations.

where the rents for accommodation are lower in those areas most at risk from flooding, for example Korail in Dhaka (Jabeen, Allen and Johnson 2010). On the other hand, the better-



located informal settlements are often at risk from eviction due to planned development. Assessments of risk and vulnerability need to recognize the diversity of physical contexts, of resident and community capacities, and of individual or household appetites for risk.

Inadequate infrastructure and services

The adverse effects felt by poor communities without access to sufficient infrastructure is obvious and well-documented. However, poor infrastructure poses a greater range of threats to cities – and puts obstacles in the way of achieving resilience.

A global decline in adequate infrastructure. Basic infrastructure and services can substantially decrease exposure to hazards or reduce physical and social risk significantly. This includes piped water, sanitation and drainage networks, all-weather roads, grid electricity, health care, emergency services, solid waste collection, schools, policing/rule of law, and social

Basic infrastructure and services can substantially decrease exposure to hazards or reduce physical and social risk significantly.

protection. Yet there is evidence that provision of these essential public services has actually declined in recent decades: between 1990 and 2015, the proportion of the urban population with access to water piped on premises declined in 21 countries, for example (Satterthwaite 2016b). This can in part be attributed to rapid urban growth, as change is faster than the ability of local authorities to supply adequate infrastructure and basic services to the population.

Poor infrastructure now threatens a broader cross-section of society. For many cities, deficiencies in infrastructure and service provision and in land-use management are so severe that risks threaten large sections of non-poor groups and even the functioning of the whole city.¹² Climate change often exacerbates local risks and may also result in implications for the whole city – the economy, health (and disease control), infrastructure, food security, and water supplies (Lwasa, et al. 2014). One example is urban flooding where a combination of factors have increased risk: climate change results in more intense rainfall; urbanization reduces the retention capacity of the soil; channelizing rivers increases water runoff and velocity; and poor solid waste management and lack of maintenance impede drainage.

The cost of improving infrastructure.

Infrastructure-based solutions to these risks can be extremely expensive. The cost of protecting the 100km coastline of Dar es Salaam with a sea wall would be USD 270 million, for example (J. Kithiia 2011). Costs like this may be unaffordable to both the local and national economies in poorer countries. It is imperative to develop accountable and responsive governance systems that can reduce risk through capacity building and land use planning, rather than investing in large construction projects.

Inadequacies in local governance

Some threats do not come in the form of external shocks or a lack of resources: They are internal to the governments of cities, and avoidable. Yet they can pose just as severe a threat to achieving resilience.

Poor local government exacerbates poor service delivery.

Conversely, good local governance reduces the impact of risks. Well-governed cities that provide for risk reducing infrastructure and services to all those in their

jurisdiction have much lower levels of ill-health and premature death from everyday risks (Mitlin and Satterthwaite 2013) and from small and large disasters (United Nations 2009). These cities thus have the institutional and governance capacity to extend their resources to disaster risk reduction and climate change adaptation – and to assess how these agendas mesh (Bartlett and Satterthwaite 2016). In this sense, deficiencies in the provision of infrastructure and services are both characteristics of urban poverty as well as of local government or governance failure. A lack of public participation in planning processes as well as non-inclusive regulatory frameworks can further impede the provision of urban infrastructure and service delivery to low-income communities.

Weak city government is often unaccountable to residents, especially the poor. Resilience for the urban poor is tied to the quality of government capacity and accountability. This begins with a willingness to listen to, work with, support, and serve those who lack resilience in their homes and livelihoods. Weak and unaccountable city and municipal governments contribute to the lack of basic infrastructure and services, the dynamics of land markets and lack of access to safe land by the poor (Pelling 2003, Merlinsky, Tobias and Ayelén 2015). Clearly, other factors are also at play which include political economy, cultural and ethnic issues and distortions in the legal system. Globally, most urban governments lack the capacity and resources to address deficits in infrastructure and services; many are unwilling to extend these to informal settlements (Satterthwaite 2013). In Khulna in Bangladesh, for example, political systems are not accountable to – and thus do not serve the needs of – the inhabitants of informal settlements (Roy, Hulme and Jahan 2013).

2.3 A GROWING AWARENESS OF THE URBAN RESILIENCE-POVERTY LINKAGES

Disaster risk management is increasingly geared to address the lack of resilience among much of the low-income population and settlements to hazards. There is a growing literature on how the lack of disaster risk management contributes to urban poverty – and how the global databases on disasters miss much of this due to the small-scale and localized nature of the hazards.¹³

Deficiencies in the provision of infrastructure and services are both characteristics of urban poverty as well as of local government or governance failure.

In the climate change community, the IPCC's Fifth Assessment included a much more detailed coverage of urban issues, including urban poverty. It demonstrated a more nuanced understanding of the many ways in which urban poverty and discrimination exacerbate vulnerability to climate impacts, and reflected the growing literature on the drivers of vulnerability: socioeconomic, cultural and gender inequalities, as in limited access to health services, education and labor markets (Ayers 2011, Romero, Qin and

Resilience for the urban poor is tied to the quality of government capacity and accountability.

A growing body of evidence demonstrates that risk reducing infrastructure and services can not only alleviate poverty, but also improve individual and household resilience and for neighborhood and city resilience.

Dickinson 2012, Mérida and Gamboa 2015). The Assessment also described how the framework of urban resilience should be related to wider sustainability challenges, including the increasing social inequalities in cities (see also Chelleri, et al. 2015). In particular, it discussed how upgrading informal settlements by reducing basic service deficits and improving housing conditions could reduce hazard exposure, especially of the poor and vulnerable.

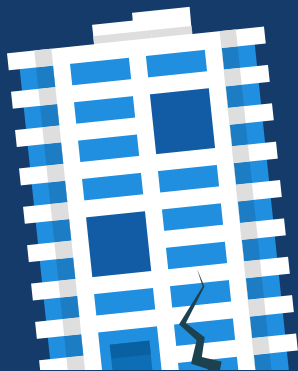
The links between poverty and risk reduction are also found in the literature on urban poverty.

One important theme in the literature has been how assets can give low-income households a greater capacity to cope with stresses or shocks (Moser 2006, Moser 2007). While this study focused initially on economic shocks, it came to include disaster risks, and it integrated well into climate change adaptation concerns. Similarly, a growing body of evidence demonstrates that risk reducing infrastructure and services can not only alleviate poverty, but also improve individual and household resilience and for neighborhood and city resilience. (Tanner, et al. 2015) The below diagram summarizes the key messages from much of this literature with their description of the “triple dividend” for urban poverty from resilience:

URBAN POVERTY and RESILIENCE: The Triple Dividend

RESILIENCE = Disaster resilience + Wider economic, social and environmental development

RESILIENCE = Dividend 1 + Dividend 2 + Dividend 3



Dividend 1: saving lives and avoiding losses

This is of particular relevance since an increasing share of damages and losses are sustained in rapidly growing urban areas in low and middle income countries.

Dividend 2: unlocking economic potential

There is evidence that reduced background risk and effective risk management allow poor households to build up savings, invest in productive assets and improve their livelihoods.

Dividend 3: generating development co-benefits

Co-benefits can be classified as economic, social and environmental, and may either be deliberately designed into DRM investments or incidental.

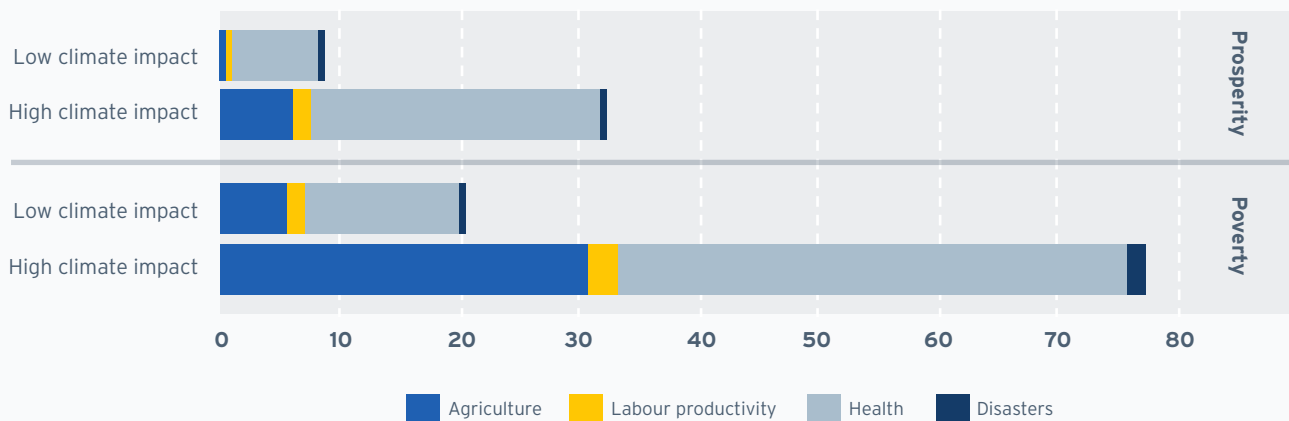
2.4 URBAN POVERTY IMPACTS

The main determinant of future levels of income-poverty in low- and middle-income countries will be the type and rate of economic development. Universal access to basic services and a reduction in inequality, underpinned by inclusive and accountable governance structures, would deliver much greater rates of poverty reduction than will be achieved under business-as-usual patterns of development. It is these wider conditions that will determine urban residents' resilience to climate change, rather than the scale of discrete investments in adaptation, as shown in the World Bank's flagship report, *Shock Waves: Managing the Impacts of Climate Change on Poverty* (Hallegatte, et al. 2015). The other determinant is the extent of climate change: a global temperature increase of 3-4°C would lead to more frequent and severe extreme weather events, more rapid sea level rise, declining agricultural productivity and a greater disease burden than an increase of 1.5°C. In addition, for cities, the larger the increase in temperatures, the less the capacity of even comprehensive adaptation to keep down risk (Revi, et al. 2014).

Ignoring urban resilience can reverse development gains by sending millions back into poverty. The Shock Waves model suggests that, with widespread prosperity and low climate impacts, 8.5 million additional urban residents will move below the poverty line by 2030 because of climate change. This rises to 32.2 million with high climate impacts (see Figure 2.1). However, under conditions of widespread poverty, 20.3 million urban residents will slip below the poverty line even with low climate impacts, while 77.3 million face a return to poverty with higher climate impacts. The primary climate-related drivers of increased urban poverty are higher agricultural prices, which mean that low-income groups have to spend more on food, and increased incidence of diarrheal diseases. Most of the increase in urban poverty due to

For cities, the larger the increase in temperatures, the less the capacity of even comprehensive adaptation to keep down risk.

FIGURE 2.1: Number of urban dwellers living below the USD 1.25/day poverty line under different economic and climate scenarios



20.3 million urban residents will slip below the poverty line even with low climate impacts, while 77.3 million face a return to poverty with higher climate impacts.

climate change will be concentrated in South Asia and sub-Saharan Africa (Figure 2.2).

The actual impact of inadequate resilience on urban poverty is likely to be much higher.

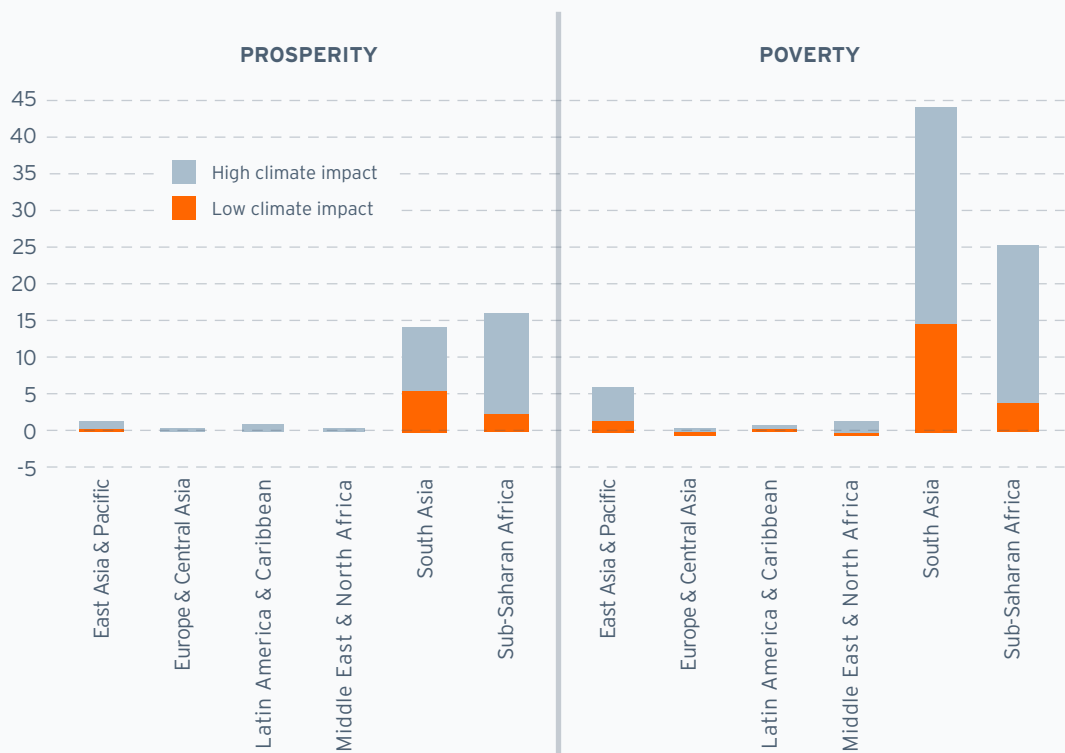
First, the model underestimates the extent of urban poverty by using a now-outdated poverty line of USD 1.25/day to indicate the severity of climate impacts. While the currently accepted global poverty line (now at USD 1.90/day) may be appropriate for rural areas, urban poverty needs to be understood in real terms: inadequate access to reliable, safe drinking water, secure tenure, durable and permanent housing etc.¹⁴

The estimates therefore downplay the number of urban residents likely to slip back into poverty due to the impacts of climate change. Nonetheless, the model does provide valuable insights into the likely drivers and distribution of urban poverty under different economic and climate conditions. Additionally, the model does not consider the current economic consequences of disaster impacts on urban poverty (just the additional impact brought by climate change). This is being assessed by a separate World Bank report that is under preparation.

In this chapter we have seen the importance of city resilience for the urban poor.

It has the potential both to mitigate the effects of shocks and stresses, and to protect the gains already made in the alleviation of poverty globally. We have also seen the growing importance placed by institutions on the resilience agenda. In the next chapter, we shall examine the role of public finance and private investment in driving this agenda.

FIGURE 2.2: Distribution of urban dwellers living below the USD 1.25/day poverty line in different geographic regions





03

Financing Needs and Overcoming Obstacles



Shocks and stresses threaten the prosperity generated by cities. In many low- and middle-income countries, cities are hubs of economic growth, jobs and innovation, fueling their national economies. The sustainability of this growth is at risk, however, from unplanned-for shocks and ongoing stresses that erode long-term economic, environmental and social sustainability.

Infrastructure is a key driver of development and social progress, creating jobs, improving health outcomes, and facilitating trade. Enhancing infrastructure investment is critical to achieving the World Bank's twin goals as well as to increasing the resilience of cities. Thus financing urban infrastructure to adapt to and prepare for these shocks and stresses has emerged as one of the most urgent challenges in development. An alignment of political will, institutional capacity, and access to financing are imperative in order to make sometimes difficult choices to align policies and to allocate precious financial, human and political resources towards activities that promote cities' long-term resilience.

Estimates of the infrastructure gap vary by city, by sector and by country. For example, in sub-Saharan Africa, infrastructure spending needs (including capital and operations and maintenance) range from a high of 37 percent of GDP in fragile low-income countries to 10 percent in middle-income countries (Briceño-Garmendia et al, 2008). But consensus exists regarding the need to increase infrastructure investment and activities that would increase the resilience of cities. Given that urban areas are more vulnerable to shocks such as economic downturns, social upheaval, public health epidemics, or the failure of infrastructure to meet demand (World Bank 2014a), there is also consensus about the urgency of identifying viable strategies to address these needs for investment.

In this chapter we explore some of the opportunities for both public finance and private investment in funding urban resilience. We also look at the limitations of and constraints upon each of these, and consider examples where

Enhancing infrastructure investment is critical to achieving the World Bank's twin goals as well as to increasing the resilience of cities.

these challenges have been met by the successful use of various instruments provided by the World Bank Group and other institutions. Finally, we examine some city-specific case studies where public finance, private investment or a blend of both have been successfully used to make cities more resilient while offering a return to investors.

The returns to a society that invests in infrastructure are well-established.

Infrastructure investments can increase potential economic growth through promoting capital accumulation and higher productivity. A one percent increase in spending on infrastructure leads to an average of 1.5 percentage points in GDP growth over four years. In countries where infrastructure is well planned and well executed, the return was even greater – 2.6 percentage points over four years (IMF 2014). This difference suggests the importance of the role of government in ensuring that infrastructure delivers the biggest possible economic and social dividend. As was explored in a 2014 World Bank report on Prioritizing Projects to Enhance Development Impact, the potential benefits of infrastructure are even larger when network and cross-sectoral impacts and synergies are accounted for. Investments in a platform of resilient urban services may produce economic returns greater than the sum of individual investments, as infrastructure investments may change land usage, increase productivity levels, change settlement patterns, and enhance property values.

An alignment of political will, institutional capacity, and access to financing are imperative.

3.1 FINANCING NEEDS FOR MAKING CITIES MORE RESILIENT

Significant additional financing is required to make urban infrastructure more resilient, especially in the developing world. The global need for urban infrastructure investment amounts to USD 4.5 - 5.4 trillion per year, of which an estimated premium of 9 - 27 percent is required to make this infrastructure low-emissions and climate resilient (CCFLA 2015). A significant proportion of this demand is from cities in the developing world. And this is only a partial estimate of the investment needed to make cities 'resilient' as this number focuses only on urban infrastructure. The marginal costs of enhancing urban resilience through investments in public health, more robust urban systems, anti-terrorism measures, and other building blocks of social and environmental resilience have yet to be estimated.

Infrastructure investments can increase potential economic growth through promoting capital accumulation and higher productivity.

Investments in resilience deliver varying levels of return. Resilience investments can be broadly split into three categories:

Investments that are pure public goods. These investments do not generate market-viable returns, and require direct investment by either governments or donors. Indirectly, however, such investments can help to support social stability and have a positive impact on economic growth and government treasuries. Examples of public goods might include flood control

systems (that primarily benefit very low-income areas) or recidivism-prevention programs.

Investments that generate below market-rate returns. For such projects, project cash flows might not be sufficiently predictable or high enough to attract private capital, based on the market's perception of risks. In this space, MDBs or donors can help lower certain political and financial risks to catalyze private investment, for example through political risk insurance or credit guarantees. Another approach is blended or concessional finance, which seeks to crowd in private capital by shifting the investment risk-return profile and reducing the risk with flexible capital and favorable terms. Such investments might include public transport.

Investments that generate market-viable rates of return. Such investments can attract additional, private investment if a project has been well-prepared and the regulatory and institutional context is stable and investor-friendly. These types of projects can be catalyzed by government or donor financing of project preparation, or the use of targeted guarantees. Examples of these types of urban resilience investments include concessions to construct a water treatment plant or to upgrade street lighting citywide to greener light-emitting diodes (LEDs).

In the case of the first of these, financing needs are met largely by governments and development partners. In the case of investments generating below-market returns, they may be met by a blend of public and private financing, while the investment opportunities represented by the third modality may be attractive for private investors if certain conditions are met.

3.2 OBSTACLES TO FINANCING URBAN RESILIENCE

Obstacles to unlocking significant public and/or private investment in urban resilience fall within four broad categories:

- Lack of government capacity;
- Lack of private sector confidence;
- Challenges in project preparation; and
- Financing challenges

The solution to each of these obstacles varies by sector and depends, of course, on whether the investment is market-viable (i.e., could attract private capital), a public good (i.e., requiring government or donor finance) or whether it generates a below-market rate of return. The sections below give examples of where the World Bank can offer solutions to help cities and private investors meet each of these challenges.



Lack of government capacity

Despite increasing interest from private investors in infrastructure investment opportunities, there are multiple obstacles to private sector participation. Cities in

the developing world need much more than “access to global capital markets” in order to invest in resilience-increasing activities, as they are constrained by other factors. The private sector can help make markets more efficient, but governments provide the regulatory structure and institutional capacity in which markets function. In addition, the solvency

and creditworthiness of city governments is as critical as the ability (or lack thereof) of local governments to generate needed revenue to maintain existing programs. A more enabling environment is also conducive to identifying and preparing investments that will help leverage private sector financing. These range from their national regulatory environment to city-specific creditworthiness, which may limit access to credit for climate adaptation or infrastructure investment, generally.

Cities in the developing world need much more than “access to global capital markets” in order to invest in resilience-increasing activities.

Many cities struggle with the planning and implementation of resilience investments.

Among the challenges faced by cities are insufficient urban planning capability, inadequate local project assessment and planning processes, and limited implementation and enforcement capacity. At the basic level, many cities in the developing world do not engage in long term planning for infrastructure and lack capital investment plans. Further, cities may lack data about risks to which they are subject and/or capacity to understand how to incorporate such data into their urban planning and capital investment strategies. Cities may fail to take into account climate mitigation and adaptation goals in urban land use and strategic investment plans, and local decision-makers may be unaware of how to prioritize among projects so as to maximize risk reduction and what types of projects to undertake to further their resilience-related goals and promote long-term growth. Or the government may lack an understanding about how to evaluate specific policy or investment decisions they are considering against a range of consequences in the future.

The World Bank Group can support and incentivize cities to improve capacity in project assessment (including hazard and risk assessments) as well as better structuring and implementing resilience investments.

Solutions: The World Bank Group can support and incentivize cities to improve capacity in project assessment (including hazard and risk assessments) as well as better structuring and implementing resilience investments. The World Bank Group maintains a global knowledge base, financial and technical expertise as well as grant resources to support cities in incorporating resilience into their planning and investment strategy, builds capacity for preparing financeable projects, and leverages development assistance and has worked with many government around the world to help them incorporate risk information into public investment. This type of technical support can help governments prioritize among capital projects, and determine which would be appropriate to be funded by public funds vis-à-vis other potential capital sources, such as private investors, development banks or donors.

Historically, most infrastructure in emerging markets has been financed with public funds, given the nature of public goods and positive externalities generated by such investments.

Existing revenue sources (e.g., property taxes, local user fees, and intergovernmental transfers) are unlikely to be sufficient to meet the infrastructure needs, much less the broader 'resilience' needs, of municipalities. Public deficits, increased public debt-to-GDP ratios and, too frequently, the low capacity of the public sector to deliver efficient spending has limited the capital governments have committed to

these types of investments. Further, the public sector inevitably struggles to balance multiple competing policy priorities; infrastructure, which offers longer-term benefits, can often get cut in favor of more urgent constituent needs. Also, political interference in large-scale urban infrastructure projects can cause misallocation of resources. Further, although governments in emerging markets have traditionally assumed most of the burden, the scale of infrastructure required makes attracting private investment critical. Long term borrowing from commercial bank or capital markets is appropriate where the infrastructure (e.g., roads or water) will provide benefits for a long period, e.g., over a 30+ year horizon. Other ways to access private capital include through public-private partnerships. Impact fees charged to developers can also provide needed funds to pay for upgrades or expansion of existing infrastructure.

Solutions: One established tool for providing grant-funded technical assistance to subnational governments to address regulatory and institutional obstacles that might be preventing private investment in infrastructure is the Public Private Infrastructure Advisory Facility (PPIAF). Technical assistance provided through PPIAF can support governments in preparing and structuring infrastructure investments.

The World Bank Group can provide in-depth technical advisory support to governments to help assess and compare service delivery options.

Another resource is a recently created trust fund, "Project Development Facility to Support Infrastructure to Build Resilience," whose seed funding of USD 10 million was provided by the Rockefeller Foundation for use by the IFC for the purpose of catalyzing financing for infrastructure projects that would support increased economic, social, and/or environmental resilience.



National legal and regulatory systems can deter potential private sector investors. Capital inflow controls, tax policies, labor policies, and inconsistent tariff policies can build complexity into a transaction and reduce the attractiveness of investment. Some countries' regulatory frameworks require international firms to partner with local investors as co-financiers, for example, which can add complexity, introduce uncertainty and increase cost of doing business. In other countries, national regulations may not explicitly allow subnational entities to engage in public private partnership (PPP) structures that can be used to leverage private capital and expertise.

Solutions: Through engaging in an assessment of the “subnational cost of doing business,” a proven methodology deployed in Colombia, Egypt, Mexico and Nigeria in the past few years, the World Bank can help governments understand the differences in their business regulations and enforcement within a single country and within a comparator group and identify opportunities to address obstacles that may be impeding desired private sector investment. This tool provides data to local and national governments on the ease of doing business, and recommends reforms to improve performance in each of the indicator areas. These reports have been done as well to highlight challenges in specific sectors or policy areas, such as contract enforcement or measuring the cost of red tape.

The private sector can help make markets more efficient, but governments need to provide the regulatory structure and institutional capacity in which markets function.

Policy uncertainty can limit investor interest.

Many developing and middle-income countries are still developing concrete policies for resilient development. This lack of certainty about future regulatory policies or subsidies – e.g., tariff structures related to service delivery – can deter private investors. In addition, political and social instability can further dissuade private investors.

Solutions: Different types of guarantees offered by the World Bank Group can help to reduce both the actual risk and perception of risk to investors. For example, MIGA can provide political risk insurance (PRI) for private sector investments to mitigate and manage the risk associated with an uncertain political environment (e.g. adverse actions – or inactions – by governments). Such tools help create a more stable climate for investments, and hence, unlock better access to finance. Specific risks covered include:

- currency inconvertibility and transfer restriction;
- expropriation;
- breach of contract; and
- war, terrorism and civil disturbance.

The World Bank can, through investment project financing, directly finance infrastructure.

In post-civil war Cote d'Ivoire, for example, MIGA is providing USD 145 in insurance covering the equity investor and all of the project's private sector lenders as well as FMO, the development finance institution of the Netherlands. Specific infrastructure investments covered include the Henri Konan Bedié Toll Bridge over Abidjan's Ebrié Lagoon, which was initially shelved following the outbreak of civil war.

Obstacles cities face in investing in 'resilient' infrastructure largely overlap with the obstacles cities face with respect to infrastructure generally. In many cases, such barriers are structural. A not uncommon challenge, for example, is a misaligned division of urban management functions and powers across institutions and levels of government. For example, a national or provincial level government entity may have the power and resources to make urban transit investments,

but the local government has the authority over zoning and land use. Or the national government may hold policy and budget authority over provision of social housing, while municipal governments are responsible for ongoing provision of local infrastructure to public housing.

Solutions: The World Bank Group can provide in-depth technical advisory support to governments to help assess and compare options. A number of WBG teams, including those specialized in governance, work with governments to improve transparency, accountability and service delivery. The team focuses on helping strengthen public sector management systems, including the management of public finances. The Second Lagos State Development Policy Operation (SLSDPO), for example, supports the state government in the implementation of a reform program meant to further increase value-for-money in budgetary spending, improve the business climate, maintain fiscal sustainability, and properly monitor, and manage financial risks. As such, it represents the start of a new series of programmatic development policy lending in Nigeria.

Box 3.1: – Financing utilities with a bond for partial credit guarantee (Dirie, 2005)

The city of Johannesburg had large capital expenditure plans to address service backlogs, deferred maintenance payments, and population growth. Johannesburg's borrowing needs were too large for a traditional bank loan, and the city needed to diversify financing sources and extend the maturity of debt to match the life of assets. Given these circumstances, they had to come up with an alternative financing scenario.

Capital finance was required for capex expenditures planned by the city and its utilities - including water programs, urban streets, and electricity distribution - and for retiring some existing high cost debt. To raise the capital required, the City of Johannesburg developed a central treasury bond that was backed by aggregate revenues, with a negative pledge clause on major assets. Successful outcomes included:

- An enhanced AA bond (Fitch), a three-notch upgrade from Johannesburg's standalone rating of A.
- The bond issue was oversubscribed 2.3 times, demonstrating market endorsements of both the issuer and the structure with the credit enhancement.
- Strong investor demand allowed for tightening the spread over time and the long tenor of the bond issue has improved the City's debt service profile.

This type of capital fundraising has developed a new class of fundraising as a benchmark in South Africa for municipal debt that requires a long tenor, with the possibility of application in other cities



Lack of private sector confidence

Apart from the issues of government capacity and a threatening regulatory environment, there are several factors which can discourage the private sector from investing in infrastructure projects. Among these is the lack of benchmarking data and global standards for measuring 'resilience'.

Several factors contribute to a low percentage of investment by institutional investors.

These include the complexities in the investment decision making process¹⁵, the inherent diversity and intricacies of large assets, country-specific financial regulations, lack of well-developed financeable projects, risk return equation, lack of robust benchmarking data, and the lack of experience of fund managers. Another factor is the relatively long time it takes for funds to deploy capital in infrastructure: 3.5 years versus 2 years for real estate assets, for example (Invesco, 2016). Another problem is that benefits from resilience are often unobservable and difficult to capture: there is no additional cash flow for firms or households each time a storm does not result in disastrous damages.

Solutions: One way forward is to generate the conditions required to substantially increase private investment in resilient urban infrastructure. Logically, government should focus on pure public goods, which would remain unaddressed in the absence of government or philanthropic investment. However, financial resources from government, international development assistance and MDB sources should also be concentrated on generating the local institutional capacity and regulatory conditions necessary to facilitate private investment in resilience-increasing investments that do generate market-viable returns. Doing so often requires a government maintain effective start-up and operating

licensing regimes, establish competition law and mechanisms of enforcement of competition regimes as well as implementing risk-informed land use and building regulations. For urban infrastructure, in particular, government needs to be able to serve as a competent regulator, to prepare a project for investor-readiness, and in many cases to fund some portion of project conceptualization and preparation process.

Developing countries still grapple with issues such as poor governance framework, perceived rampant corruption, and political uncertainties – all of which increases investors' perception of risk and commensurate returns. While

these obstacles can be addressed on one-off bases, such as through credit enhancements, unless and until the core issues are addressed, private sector investments will not freely flow. Also, many developing countries – much less subnational governments – do not yet have robust, investor-friendly processes for soliciting investor interest and/ or procuring large projects.

Governments, investors, and operators alike would benefit from sharing more information and in more structured ways.

Large investors seek data benchmarks to track performance of assets, a challenge beyond the scope of cities to address. For institutional and sovereign wealth funds, investing in long-term, illiquid infrastructure assets is a strategic asset-allocation decision. Ideally, investors would make the decision based on benchmarks that allow them to take a robust view of the expected performance of these investments. Without the feedback of market prices, it is difficult to formulate reasonable expectations of risk and return, however, as track records of such projects are limited. This often means that proxies are used as benchmarks. In general, governments and businesses aren't in the habit

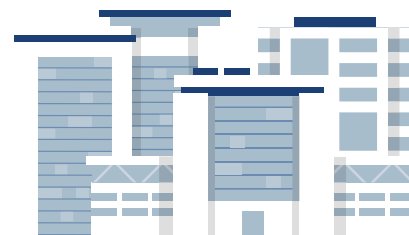
of sharing best practices or benchmarks with each other with respect to infrastructure assets, much less the details of what went wrong. Governments, investors, and operators alike would benefit from sharing more information and in more structured ways. Many governments recognize that investors can be a valuable source of ideas – for example, about which projects would have the best economic returns or how to attract private investment. The OECD notes that a prerequisite task for increasing participation of market-based instruments in infrastructure, would be to establish industry-wide reporting standards, consensus definition and metrics for ‘resilience,’ and benchmarking of comparable projects (OECD, 2014). Basically, private investors have knowledge gaps which impede their understanding of the investment opportunities in often unfamiliar, ‘frontier’ markets. Investors’ demand for performance monitoring is a challenge that governments have not yet been able to address.

Solutions: The Global Emerging Markets Local Currency Bond Index (GeMX) reflects the performance of emerging market local currency denominated debt from countries qualifying for the World Bank Gemloc program. The index tracks 360 bonds from 24 countries, providing accurate and objective benchmarks to assess the performance of bond markets and investments. Such data can be used to help crowd in private financing for resilience investments (World Bank, 2012).

Currently, no universally accepted, global standards exist for metrics of what makes a project “sustainable” or “resilient.” There is general consensus among investors that such promulgation of common standards could potentially unlock significant amounts of capital.

Solutions: The World Bank Group has been engaged, through multiple formal and informal working groups, with various types of private sector, development bank, and donor

partners over the past several years to agree on common principles on climate finance, and other resilience-related categories of investment. A number of concepts or systems have been put forth as contenders for global standards. In September 2016, for example, the fund labelling agency LuxFLAG launched a Climate Finance label, intended to identify funds financing climate change mitigation and/or adaption measures. Four fund managers – East Capital, Finance in Motion, Luxembourg Microfinance and Development Fund and Nevastar Finance – have since announced they will be seeking labelling of their products using this new certification standard. This standard is a practice effort to create a more transparent financial environment and provide investors with the necessary trust in climate finance investments, and respond to commitments made through the Paris Agreement on climate change. Another system that has been put forth is the SuRe® Standard, jointly developed by GIB Foundation and the French investment bank Natixis, for the purpose of defining sustainability and resilience principles for the credit rating and insurance of infrastructure.



Challenges in project preparation

There are compelling reasons that many resilience projects do not get out of the starting gate. For governments, the high upfront costs of project preparation can be an insurmountable barrier to such projects. Similarly, a lack of capacity amongst municipal



and national governments to conduct long-term planning (e.g. prepare capital investment plans) or to incorporate hazard and risk considerations in project design and preparation further challenge the long-term sustainability of not only the project itself, but also of the investment. The ability to maintain services and rebound following a disaster event or to withstand the prolonged impacts of shocks and stresses are often determined by the initial planning and design of such infrastructure. Similarly, accurate long-term budget planning for operations and maintenance of such infrastructure is largely determined by the incorporation of the full range of hazard and risk considerations in the project preparation stage.

Budgetary constraints limit many cities from investing in resilience, even in the preliminary stages. Most initiatives that promote social resilience – community-driven literacy programs, nutrition campaigns or crime-reduction initiatives, for example – do not generate immediate economic returns, even if they offer measurable social and fiscal benefits over the long-term. Such “public good” investments

require cities to have access to resources to fund program design, implementation and monitoring. Many city governments cannot afford to pay for costly feasibility studies, and may lack the experience and institutional capacity to identify a “business case” for investment-ready projects.

Solutions: The World Bank Group can provide technical and grant financing support for feasibility studies across resilience investments: for example, for the Port of Cartagena, the IFC supported USD 200K in preparatory studies to unlock USD 10 million in private sector financing for overall rehabilitation of the port starting in 2011, including climate adaptations such as improved drainage systems. The Bank’s Global Infrastructure Facility (GIF) seeks to enable mobilization of private sector and institutional investor capital for infrastructure. For “public good” investments, the World Bank Group can provide direct financing to support programs, such as the Global Program for Safer Schools which provides financing to assess the hazard and structural risk profile of a portfolio of schools and advises on investment and intervention strategies to make schools more resilient to natural hazards (World Bank, 2016d).

Financing challenges

Subnational and city governments in the developing world struggle to raise finance for infrastructural projects for a number of reasons.

These include constraints upon their regulatory and institutional capacity. They in turn struggle to provide meaningful incentives for private sector investments, and to support the smaller local businesses which could participate in their resilience projects.

Most cities in emerging markets rely on intergovernmental transfers for the majority of their operating and capital budgets.

(UN Habitat, 2009) This can make it difficult to manage a budget when such fiscal transfers are either unreliable or insufficient. The design of such transfer schemes and the level at which cities depend on national governments vary by country, but some schemes can subject their cities to highly unpredictable flows, with ad hoc or discretionary transfers (e.g., where the amounts of transfers are negotiated on an annual basis). An effect of this is that cities struggle to budget accurately and are reactive and risk-averse when deciding on the deployment of resources for long-term resilience planning or project preparation, unless it's clear that national funding will be made available for ongoing support.

Solutions: A systemic solution to this issue would be for governments to shift to a formula-based, presumably more stable transfer system. The World Bank Group, together with a number of other donors provides technical assistance that can help cities to implement such a system.

However, even subnational governments empowered to raise revenue through taxes and fees lack sufficient funding to support ongoing public service delivery needs.

Over the last twenty years, a number of countries have increased the powers and responsibilities of local government; however, revenues at the municipal level have not kept pace with the increased expenditure requirements of devolution of responsibilities (UN Habitat, 2009). In most countries in the developing world, municipal own-source revenues are generally based on property taxes and user fees – and not on more lucrative taxes such as income, sales, and fuel taxes. Property tax is typically the largest source of own-source revenues for cities, and the low amount of revenue collected may be due to combination of factors, including: low value of local real estate market; very low property tax rates (cities often have little control over the actual rates); lack of a complete, annually updated property registry; and/or weak enforcement of collections. In addition, even cities with

Box 3.1: Public-private partnership to enhance energy resilience in Zambia

The World Bank's PPP advisory team recently supported an effort to add power capacity in Zambia, where only one fifth of the population has access to electricity and two years of drought have crippled existing hydropower facilities, causing a national electricity crisis. In this context, Zambia signed up to try Scaling Solar, a program designed to make it easier for governments to procure solar power quickly and at low cost through competitive tendering and pre-set financing, insurance products, and risk products. The results of the first auction, which took place in May 2016, surpassed the most optimistic expectations, with seven of the world's leading renewable energy developers competing for the opportunity to build Zambia's first large-scale solar plants. The winning bids, for 6.02 cents per kilowatt hour and 7.84 cents per kilowatt hour, represented the lowest prices for solar power to date in Africa, and among the lowest recorded anywhere in the world.



functional property registries underutilize alternative mechanisms for raising revenue.

Solutions: In countries where fiscal decentralization has already occurred (e.g., Brazil, Philippines, South Africa), one solution is to support local governments in enhancing their capacity to generate own-source revenue. This enables governments to invest in resilience-increasing initiatives directly or to invest in enabling local environment to attract private investors to specific projects. The World Bank Group can support governments interested in creating enabling regulatory environments and addressing capacity constraints in order to unlock financing for infrastructure development. PPIAF, for example, recently helped several large municipalities in South Africa and Colombia build their capacity in expanding sources of financing for urban infrastructure by including tax increment financing. Another solution is to help governments identify and compare various business models for delivering revenue-generating public services. Governments, particularly in emerging markets, need to realize value, when possible, from cash-generating assets, such as owned real estate portfolios and infrastructure. The World Bank's Public Private Partnerships (PPP) team has deep experience supporting governments in making good decisions regarding whether and how to

reform state-owned infrastructure and/or partner with the private sector to improve access to public services such as education, electricity, healthcare, and sanitation (see Box 3.1).

Limited funding and support stands in the way of local entrepreneurs and SMEs whose business concepts serve to increase urban resilience. Private sector engagement on making private assets more resilient has been generally opportunistic rather than the result of strategic actions aimed to lead to transformational change. The inability to cluster projects limits learning and impact. Small and Medium Enterprises (SMEs) and State Owned Enterprises (SOEs) are often unable to benefit from global initiatives to increase financing for resilience and climate adaptation for a variety of reasons, including the scale of financing arrangements, and lack information on financing

The World Bank Group can support governments interested in creating enabling regulatory environments and addressing capacity constraints in order to unlock financing for infrastructure development.



opportunities. SMEs, in particular, often have limited access to coping strategies, and are more likely to be non-compliant with industry norms and regulations, which can lead to a lowered capacity to adopt risk management tools (Ballesteros and Domingo, 2015). Yet SMEs are vital contributors to the national economies of disaster-prone regions across the world. For example, the proportion of SMEs amongst all enterprises can be as high as 90 percent in countries like Japan and Thailand (UN World Conference on Disaster Risk Conference, 2015). The development of innovative business practices and business models that help to address ongoing stresses as well as natural hazards is essential to building resilience. For example, in Indonesia LiveOlive, whose founder describes it as a “money management startup,” builds financial resilience among middle and low income women, helping them cope with financial shocks and business cycles through guided personal investments. Small-scale enterprises like this one need different kinds of capital, mentoring and support at different stages of their growth – although below what funds and institutional investors would be interested to provide.

SMEs are vital contributors to the national economies of disaster-prone regions across the world.

Solutions: The World Bank is currently evaluating the feasibility of creating a “Global Resilience Infrastructure Fund,” a market-based hybrid private-public Fund with a core focus on generating strong multipliers between investment by the public sector and investment by private investors. The Fund objective would be to crowd-in private capital in resilience infrastructure and SME projects/funds.

Many cities lack the funds or creditworthiness

The development of innovative business practices and business models that help to address ongoing stresses as well as natural hazards is essential to building resilience.

to attract private sector investment. The common challenge of insolvency amongst municipal governments due to an inability to generate sufficient revenue to meet existing obligations and maintain ongoing programs further increase the risk associated with municipal lending. These constraints add to the cost of project preparation, contribute to investors’ perception of excessive risk, and generate or exacerbate below-market returns.

Solutions: Technical assistance programs such as the City Creditworthiness Initiative can help support cities’ creditworthiness, as can guarantees (see Box 3.1). But to address the need for ‘sponsor equity’ for infrastructure projects, the World Bank Group and other development banks can also help to fill the equity gap. The IFC already invests approximately USD 1 billion annually in infrastructure. The recent launch of the WBG’s Global Infrastructure Fund will increase the amount of equity available for resilient urban infrastructure: the Fund’s mandate is to make equity and equity-related investments alongside IFC in a broad range of infrastructure sectors in developing countries. The Fund raised a USD 1.2 billion round of financing in late 2013, exceeding its target of USD 1 billion, receiving capital commitments from 11 investors, with IFC and GIC (previously known as Singapore Government Investment Corporation) as anchor investors, and including nine other sovereign and pension fund investors from Asia, the Middle East, Europe and North America. The value proposition of this Fund is to offer institutional



investors a cost-efficient platform to make direct infrastructure investments in markets where barriers to entry and transaction costs for investors can be a significant deterrent.

The type and scope of public sector engagement required to design and deliver an urban infrastructure project opens categories of risks for which mitigation is sought by investors. These risks might include regulatory uncertainty, political instability, and lack of institutional capability. Urban services that are provided under natural monopolies, such as roads or water and wastewater treatment, are subject to greater government oversight and therefore susceptible to political intervention risk of which is clearly outside the control of private investors. To address these perceptions of risk, a government would need to have in place a clear regulatory framework, established and transparent procurement procedures, and the technical capacity to engage and transact effectively with the private sector.

Solutions: MIGA guarantees can help to address these risks. For example, in 2014, MIGA issued a non-honoring guarantee for USD 361 million to Banco Santander SA of Spain. This guarantee provided specific coverage of Santander's loan to the State of São Paulo for the São Paulo Sustainable Transport project that enabled the state to invest in transport infrastructure and related activities. Additionally, governments themselves can issue different types of guarantees or revolving lines of

credit that can address such risks as well.

Foreign investment in infrastructure in emerging markets can involve exposure to foreign exchange risk. Foreign financing can create a mismatch between income obtained from providing infrastructure in local currency, and payment of debt in foreign currency. Hedging must be paid for. The currency mismatch has been, for some projects, a source of instability and has even resulted in the renegotiation of long-term contracts. For many "frontier" markets, currency swaps are not commercially available.

Solutions: The World Bank Group can provide such swaps. For example, in the case study below, the Asian financial crisis resulted in major issues for a number of private power projects provided by IFC.

Cities struggle to access finance for resilience. To increase resources available for investment in resilience, cities could borrow from commercial banks or capital markets. But few cities in emerging markets are able to do so, lacking the legal authority to borrow, independent of a sovereign guarantee or approval from the national government. Poor creditworthiness is another constraint where, in some cases, there is a history of sub-national government defaults. Cities in emerging markets that are legally able to borrow often try to raise capital through the local banking sector whose loan terms are typically unsuitable for funding new infrastructure. While capital markets

offer an alternative source of cheaper and longer-term finance, less than 20 percent of the 500 largest cities in developing countries have access to local capital markets and only 4 percent have access to international capital markets.

Solutions: The City Creditworthiness

Initiative provides technical assistance and training to cities seeking to enhance their creditworthiness by:

- strengthening financial performance;
- developing an enabling legal and regulatory, institutional and policy framework for responsible sub-national borrowing;
- improving the demand side of financing by developing sound, climate-smart projects; and
- improving the 'supply' side of financing by engaging with private sector investors.

Increasing urban resilience will require investment of all kinds: public and private, MDB lending and development assistance, domestic and foreign direct investment.

Since the program's launch several years ago, the Creditworthiness initiative has worked with more than 260 local authorities convened at academies in Tanzania, Colombia, Jordan, Rwanda, Turkey, among other countries, towards a goal of assisting 300 cities on the path to improved fiscal management and creditworthiness. Another category of solution to this challenge is to strengthen local capital markets and/or to set up local facilities in partnership with local banks with the purpose of increasing cities' access to financing for "resilient" infrastructure investment. The World Bank Group has sponsored a number of successful comparable initiatives to unlock private sector financing with this model, most notably related to energy efficiency. In 2010, for example, the World Bank approved a USD

100 million loan to China's Minsheng Bank to develop lending for energy efficiency projects, to help the Government of China achieve its ambitious goals with respect to energy use. As part of this initiative, Minsheng Bank committed USD 500 million equivalent of its own resources to finance energy efficiency and renewable energy projects. Another more recent example is a partial risk sharing facility for energy efficiency, created by the World Bank and the Government of India in 2015, a pilot operation whose objective is to address various market barriers that impede energy efficient practices and financing, by providing coverage to reduce the risks perceived by commercial institutions in financing demand-side energy efficiency projects. The project, as designed, has the potential to unlock private sector financing at 3 to 1 ratio of World Bank funds.



3.3 THE POTENTIAL FOR PRIVATE FINANCE

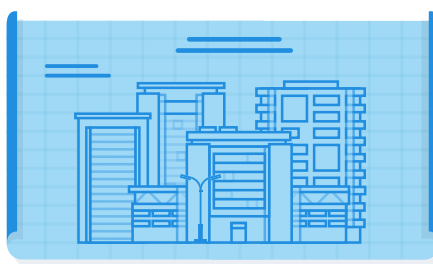
Public investment alone, even when combined with ODA, is inadequate. Given the scale of the estimated funding gap for urban infrastructure and other resilience investments, increasing urban resilience will require investment of all kinds: public and private, MDB lending and development assistance, domestic and foreign direct investment. Resilience investing will need to make the best possible use of each public sector dollar, including the USD 164 billion in net annual ODA (DAC/OECD 2014).

Private financing can flow directly into resilience-increasing urban infrastructure in the form of project equity; or indirectly by lending to projects or to a service-providing company. The importance of each channel varies across countries, depending on the degree of development of the domestic capital market, regulatory framework, sector, and investor sophistication. However, several characteristics distinguish infrastructure assets from other types of fixed capital: significant upfront construction costs; high initial risks (e.g. politics, policy changes, unexpected construction cost overruns, demand uncertainty); and timeframe of revenues (which tend to be decoupled from period when capital investment is required). These characteristics imply that, arguably, the most viable way to pay for urban infrastructure is through a project finance approach of long-term financing, such as long-term bond issuances and financing from institutional investors (e.g., sovereign wealth funds).

The largest share of project finance typically consists of debt, which is usually provided by creditors with no direct control over managing the project. They try to protect their investment through collateral and contracts, known as the security package, to help ensure that their loans will be repaid. The quality of the security package is closely linked to the effectiveness of the project's risk mitigation. Because project financing relies on the project's cash flows and the contractual arrangements that support and ensure those flows, it is essential to identify the security available in a project and to structure the security package to alleviate the risks perceived by participants. Some projects may need additional support—in the form of sponsor or government guarantees—to bring credit risk to a level that can attract private financing. Equity (sponsor, vendor, private investor) and bank loans are more common during the construction phase of a project (when risks are higher), while bonds are more commonly

used during operational phases (when projects can generate cash flows and risks are lower).

Investment capital seems to be abundant yet little is flowing towards resilient urban infrastructure, particularly to projects in the poorest countries. There is large funding potential among traditional as well as non-traditional investors for urban infrastructure. Long-term-investors such as pension funds and insurance companies have expressed willingness to increase their allocation to this asset class (OECD, 2014). And USD 106 trillion of institutional capital, in the form of pension and sovereign-wealth funds, is available for potential investment (McKinsey, 2016). On the public side, only 6.4 percent of registered public financial flows in 2014 went to climate adaptation; this amounted to USD 22.5 billion in developing countries while estimated needs for investment in adaptation range from USD 140-300 billion between 2015 and 2030 (Climate Policy Initiative 2015).



To date, most private capital flowing into infrastructure projects has gone into debt instruments, which has made sense in the context of predictability of cash flows (e.g., negotiated tariffs, toll roads) (McKinsey 2015b). Equity for infrastructure has come primarily from “infrastructure funds,” which – unlike pension or sovereign wealth funds – specialize in these types of investments. While debt capital has been comparably plentiful, sponsor equity is more scarce. A 2015 McKinsey report on infrastructure notes, for example, that Brazil will have a surplus of debt but a shortfall in

The past several years have seen a steady rise in infrastructure as an asset class in its own right.

equity financing for infrastructure in coming years due to public indebtedness, a devaluing currency, and highly leveraged corporate balance sheets. In this context, potentially viable urban infrastructure projects will be unable to secure financing if there isn't enough equity to attract the debt required to complete the transaction.

Nevertheless, given the current global low-growth forecasts, institutional investors and sovereign funds have indicated strong interest in considering a broader universe of investment opportunities. These include illiquid infrastructure assets in 'frontier' emerging markets as a means of enhancing otherwise poor returns (Invesco 2016). The past several years have seen a steady rise in infrastructure as an asset class in its own right. As sovereign funds have continued to receive new funding, they are taking a long-term view of their investments by increasing their average time horizons for investing and by diversifying their positions, including through increasing their allocation to infrastructure. This deepens the pool of capital available for infrastructure (Sovereign Wealth Fund Institute, 2016). According to Invesco's 2016 annual survey of sovereign funds, for example, the average sovereign investor portfolio exposure to infrastructure grew from 1.4 percent in 2012 to 2.8 percent in 2015 – a compound annual growth rate of 25 percent.

An ongoing, concerted effort by the development community and private sector is needed in order to create a pipeline of bankable projects in emerging markets, particularly in the poorest countries. As noted in a July 2016 World Bank blog about public private partnerships, among the 66 IDA countries,

defined as having annual per capita income under USD 1,215, only 9 had private infrastructure projects closed in 2015. Those projects – 16 in total – were focused on energy, transport and water & sanitation, representing investments of only USD 4.6 billion in value. In contrast, USD 111.6 billion in private infrastructure investment was committed across all emerging markets in 2015, according to the Private Participation in Infrastructure database released in 2015.

In this chapter, we have looked at some of the obstacles to securing finance, both public and private, for urban resilience projects.

We have explored some of the specific ways in which the World Bank Group and its partners have sought to overcome these obstacles. In the next chapter, we will detail the strategies developed by the Bank to help cities fund their resilience agendas, and the services, programs and instruments it provides.



04

Opportunities: How the World Bank Group Can Add Value to Urban Resilience



Scaling-up urban resilience investments – particularly infrastructure investments – is critical to achieving the World Bank Group's twin goals of ending extreme poverty and promoting shared prosperity. Given the development gains at risk and the increasing growth and complexity of urban systems, the World Bank Group provides financing as well as technical and advisory services to city and country clients interested in investing in urban resilience. As seen in the previous chapter, the need for urban resilience financing is massive. This is particularly relevant in the context of decentralized countries where subnational governments' current spending levels are often not sufficient to address the demand for urban public services, let alone the 'additional' costs associated with investing in adaptation and resilience. Multilateral development finance institutions such as the World Bank Group can play a critical role in helping prepare resilience investments, and anchoring and leveraging private capital to bridge the gap in needed finance to scale up resilient project interventions. This is in line with the World Bank Group commitment to stay at the forefront of this growing field and to deliver financial and technical assistance that proactively supports city resilience as a whole, in addition to addressing specific threats (World Bank 2014a).

This commitment represents a great opportunity for private investors interested in financing urban resilience projects. Here, we will highlight the ways in which the World Bank Group can help to mobilize private capital, institutional investors, sovereign wealth funds, and donor aid to ensure that the billions in available development finance can crowd in the trillions in additional finance required to meet these needs. A critical consideration for any private financier is the balance between risk and return on a potential investment opportunity. While purely privately-financed infrastructure

Multilateral development finance institutions such as the World Bank Group can play a critical role in helping prepare resilience investments, and anchoring and leveraging private capital to bridge the gap in needed finance to scale up resilient project interventions.

has achieved a number of successes in the developing world, as we have seen, the level of risk associated with such investments is often too high for private financiers. In addition, municipal and national entities lack the capacity to prepare and structure projects on a large scale so as to make them appealing to private capital. The World Bank Group can help to overcome some of the obstacles to resilience finance identified in the previous chapter through financial instruments, advisory services, and technical assistance that helps lowers risk and facilitates sound and effective project design to strengthen investor confidence in potential urban resilience investments.

4.1 – WHAT STRATEGIES ARE IN PLACE TO HELP SECURE RESILIENCE FUNDING?

While financing needs vary by city and sector, there are some common threads. First, reforms are needed to create a more conducive climate for pro-poor investment in urban resilience. This requires addressing institutional bottlenecks, regulatory reform, capacity for public-private engagement, and better resilience planning. Increased and dedicated financing

Box 4.1: South Africa Project on Utility Driven Energy Efficiency / SmartGrid

In late 2006, an accident resulted in the shutdown of the Koeberg nuclear plant in the Cape Town area. Because of the accident's magnitude and limited generator reserves or transmission capacity to meet this shortfall, the area would have suffered from several months of chronic black outs. The power company (ESKOM) supported a program to reduce energy demand and avoided a catastrophic black out.

Two years later, ESKOM faced a second blackout, this time at a national scale. The World Bank was requested to help mitigate the power crisis given that the system was both energy and peak capacity constrained. The Bank supported three fronts of work. The first included a rapid design of a rationing program that mirrors a program instituted in Brazil in 2001. In Brazil this program helped the country save 20 percent of energy over nine months without any black or brown outs. Such programs are considered one of the most effective utility interventions to manage power rationing on the demand side.

The second aspect of the Bank program was a simplified demand management program that enabled large customers to reduce/displace off-peak consumption. The third initiative was to establish a standard offer model where the utility could “buy” energy efficiency and load reduction resources at an agreed price. As such this is equivalent to a tariff in the energy efficiency space. Based on this program, the concept has been able to manage 700 MW of peak capacity that ESKOM can use to manage their power system. This model has also been adapted to improve energy efficiency in a number of other countries.



for operations and maintenance is needed to rehabilitate existing infrastructure and sustain new investments. Also, there is a need to focus on demand-side investments to increase access to infrastructure and services, especially for the urban poor. Technical assistance programs offered by the World Bank Group can provide support to help enable such investments at the city, country, community, and household levels. For example, in 2006, the World Bank supported a demand management program in Cape Town to reduce the peak energy load on the utility grid (see Box 4.1 above).

The unique capabilities of MDBs, and of the World Bank Group in particular, can provide the catalytic resources and technical support required to leverage and crowd-in private capital, institutional investors, sovereign wealth funds and donor aid. The World Bank Group's combination of in-house capacities, knowledge and financial resources can play a critical role in reducing the 'matching' gap, and thereby start the private capital flowing for sustainable and resilient urban infrastructure. Studies show that every dollar spent by the

MDBs' climate related investments leverage three dollars in private finance (IFC 2013). In the case of the World Bank Group, this can be multiplied several times as every dollar it mobilizes through bond sales results in five dollars of lending. In relation to IBRD/IDA and MIGA guarantees, every dollar in guarantees has resulted in more than four dollars of commercial capital mobilized toward investments. In addition, the World Bank Group's extensive experience in facilitating public private partnerships (PPPs) serves as an effective way of increasing private investment through innovative risk-sharing offering. For example, by integrating output performance-based contracting, the World Bank has helped to ensure that financing is available for operations and maintenance in addition to capital expenditures (see Box 4.2 for example).

Studies show that every dollar spent by the MDBs' climate related investments leverage three dollars in private finance.

Box 4.2: Performance-based Contracting in Brazil

In an effort to explore new options for road financing, the World Bank provided through performance-based contracts for rehabilitation and road maintenance (cReMa). The project consists of components to support institutional strengthening for road financing and management, and other investments to support sustainable road accessibility and safety. The project's second component investment supported a performance-based state highway rehabilitation and maintenance 'program' for improved sustainability and safety. This component includes investments in performance-based contracts for the maintenance and rehabilitation of 1685 km of identified roadways in Bahia, along with rehabilitation and maintenance works under CREMA contracts of an additional 685 km of highways. By including road rehabilitation and maintenance in the performance-based contract, the project investment better supported the long-term resilience of the roadways. As such the provision was made to ensure that the rehabilitated roads would be able to withstand the impact of high intensity climate events such as excess rainfall and floods. Additional investments under the project included feeder road improvements, improved drainage systems, etc. Such investments also support the long term resilience of the Bahia road network.



Further, concessional finance offered and enabled by the World Bank Group can fund the incremental costs associated with 'resilience proofing' infrastructure investments and for technical assistance and project preparation work.

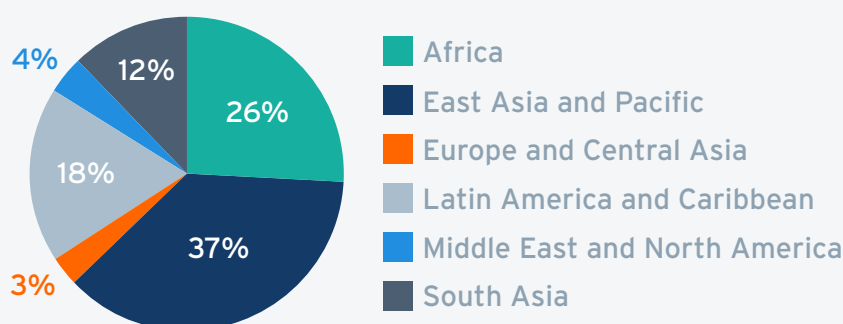
Even if the incremental costs associated with making infrastructure more resilient to climate change and disaster impacts result in savings later and are cost-efficient overall, financing higher upfront costs may be challenging, and there is a strong case for this funding to be made concessional in the smallest, poorest, and more vulnerable countries. A key element will be to facilitate country access to a menu of external climate finance instruments and work with partners and donors to harmonize, simplify, and rationalize access to concessional finance. (World Bank 2016b) For example, the IFC Blended Climate Finance team is developing a range of products and structures which will help to facilitate wider access to concessional financing. (IFC n.d.)

Ultimately, achieving the goal of increasing urban resilience will require addressing the root causes of the basic infrastructure and other gaps. While both the public and private

sectors can provide infrastructure, only the public sector can plan and regulate it. The challenge of increasing private investment in urban resilience – particularly in infrastructure – requires simultaneous action on multiple fronts, including: strengthening planning and regulatory capacities as well as institutional capacity to create a pipeline with well-prepared, investor-ready projects; and encouraging infrastructure as an asset class (to channel private investment into infrastructure). This also applies for non-infrastructure investments in urban resilience, e.g. measures to protect public health and reduce the vulnerability of the urban poor to socio-economic shocks.

The challenge of increasing private investment in urban resilience – particularly in infrastructure – requires simultaneous action on multiple fronts.

FIGURE 4.1: Urban Resilience Lending Commitment by Region FY12-16



4.2 WHERE DOES THE WBG HAVE COMPARATIVE ADVANTAGES?

An emerging portfolio of projects in urban resilience

From 2012 - 2016, the World Bank Group financed 79 core urban resilience projects in 41 countries, amounting to USD 9.72 billion. Over this five-year period, investment averaged a little over USD 1.8 billion per year (see Figure 4.1). The majority of urban resilience financing was in East Asia and the Pacific (38.3 percent) and Africa (27.2 percent), as depicted in Figure 4.2. The primary lending instrument has been investment project finance (87 percent), which includes specific investments, emergency recovery, technical assistance, adaptable programs, and financial intermediary lending. Program for Results (PforR) represented 7 percent, while development policy lending represented 6 percent of the urban resilience portfolio. A full list of core urban resilience lending can be found in Annex 2. This is a conservative estimate of financing, as an additional 151 non-core urban resilience projects were supported with financing of USD 17.5 billion during the same period. An example of an urban resilience project in Can Tho, Vietnam is summarized in Box 4.3.

Depth and breadth of experience

The World Bank Group maintains a global knowledge base, demonstrated experience and a successful track record of delivering high quality urban resilience solutions. The Bank is able to draw on several decades of international experience with development policies, projects and programs in urban development, disaster risk management and climate change adaptation. This has involved billions of dollars of lending as well as policy dialogue in thousands of cities and towns working across a range of sectors. Specifically, the Bank has worked with cities on a range of projects, policies, and programs to build social, fiscal, and physical resilience, through disaster risk management and climate adaptation approaches, municipal finance capacity building, resilient urban infrastructure, and risk sensitive land-use planning, as well as hedging and

The Bank is able to draw on several decades of international experience with development policies, projects and programs in urban development, disaster risk management and climate change adaptation.

FIGURE 4.2: Urban Resilience Lending Commitment by Instrument FY12-16



de-risking public and private investments in cities through MIGA, IFC, and World Bank Treasury. Beyond their development effects, these initiatives have made a substantial contribution to the body of knowledge on financing innovative and multi-sectoral initiatives generally.

Urban Development: The Bank's portfolio in urban development has grown in response to increased demand from client countries. Since its first urban lending operation was approved in 1972, the Bank has financed investments and technical assistance in more

The Bank's portfolio in urban development has grown in response to increased demand from client countries.

than 7000 cities and towns across more than 130 countries (World Bank 2010). The urban portfolio has included investments in shelter, infrastructure, slum upgrades, municipal development, local economic development, natural disaster management, environmental

BOX 4.3: Can Tho Urban Development and Resilience Project

Can Tho has a population of approximately 1.25 million and an annual growth rate of five percent. As the fourth largest city in Vietnam and the largest in the Mekong Delta, it is an engine of economic growth for the region and has a strategic role in promoting food security in the Delta. Although the City is growing dynamically, it faces multiple threats to sustainable development that are caused primarily by seasonal flooding, sea-level rise, land subsidence, and rapid urbanization.

A USD 322 million investment has been prepared to address the economic, social, environmental and financial dimensions of resilience by strengthening the capacity of the City to manage flood and other risks on multiple fronts. The project consists of components for:

- flood risk management and environmental sanitation;
- urban corridor development to increase intra-city connectivity and encourage compact, mixed-use, pedestrian and public transport-oriented urban development; and
- financial and social protection instruments to improve spatial planning, data and information management, post-disaster budget execution, and the responsiveness of safety nets to flood events.

The investment is co-financed by the Government of Vietnam and the Swiss State Secretariat for Economic Affairs, and was informed by the results of a CityStrength diagnostic.

Source: (World Bank 2016f)

BOX 4.4: Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP)

With 15 million inhabitants, Istanbul is not only the most populous province, but also Turkey's financial, cultural and industrial heartland, accounting for 28 percent of national GDP, generating 38 percent of the national industrial output and 44 percent of its tax income. With 188 of Turkey's 500 largest industrial companies located in Istanbul, and as the center of production, import and export, USD 82.5 billion of Turkey's GDP is at risk from Istanbul's exposure to multiple hazards, primarily earthquakes.

Over the past decade, ISMEP has helped improve Istanbul's preparedness for a potential earthquake by enhancing its institutional and technical capacity for disaster management and emergency response, strengthening critical public facilities for earthquake resistance, and supporting measures for better enforcement of building codes. The investment has resulted in:

- 1258 high-risk buildings, including schools and hospitals, being strengthened, directly benefitting about 1.5 million people;
- added value and service life to those buildings in retrofitting to the value of USD 227 million; and
- a difference between the undamaged asset value 'with' and 'without' the project of avoided direct damages in the amount of USD 728 million.

Initially supported with a € 415.26 million (USD 550 million) IBRD loan and additional financing, ISMEP has leveraged another € 1.36 billion from the European Investment Bank, Council of Europe Development Bank and Islamic Development Bank, which will continue financing risk reduction for critical public facilities until 2020 under ISMEP implementing arrangements.

Source: (World Bank 2016g)

Three times as much financing has gone to support ex-ante measures such as early warning systems and resilient infrastructure compared with expenditure on post-disaster recovery.

improvements and social services. The urban portfolio now consists of 397 active projects valued at USD 26.8 billion with 70 percent of projects located in the Africa, East Asia/Pacific and Latin America/Caribbean regions.

Disaster Risk Management: At the core of the portfolio is a robust and growing disaster risk management program. Annual financing for disaster risk management (DRM) has increased from USD 3.7 billion in FY12 to USD 5.7 billion in FY15. These investments cover both specific disaster risk management activities and the mainstreaming of DRM in other sectors such as agriculture, water, energy, and transport. During this period, three times as much financing has gone to support ex-ante measures such as early warning systems and resilient infrastructure compared with expenditure on post-disaster recovery. In addition, all financing for low-

income countries (IDA commitments) are screened for disaster and climate risks using sector-specific tools (Development Committee 2016). An example of investment in urban DRM can be found in Box 4.4, which presents the results of a seismic risk mitigation and emergency preparedness project in Istanbul.

Climate Change Adaptation: The World Bank Group has become a specialist in climate change as this is the main challenge to its core mission. Sustaining long-term poverty reduction requires the achievement of global climate objectives, including assistance to help countries adapt. From FY11-15, the World Bank Group committed an average of USD 10.3 billion a year, or around 21 percent of all commitments, to help developing countries mitigate the effects and adapt to the challenges of climate change. In that period, over USD 50 billion was committed through more than 900 projects with climate-related activities with 73 percent for mitigation and 23 percent for adaptation (World Bank 2016b).

The World Bank Group has become a specialist in climate change as it is the main challenge to its core mission.



Capacity to meet the urban resilience challenge

Making cities resilient will require a multi-sectoral approach. As we have seen, cities are made up of complex and highly-dependent networks of systems. Shocks and stresses can impact a range of different sectors, while building resilience involves coordination across different services, functions and stakeholders. The World Bank Group is well-placed to enable a cross-sectoral approach to making cities resilient. One of the largest of the Bank's new global practices is focused on sustainable communities and includes teams that cover urban development as well as disaster risk management, social development and land use. While the institutional leadership for urban resilience is based in this practice, there is coordination and joint work with other relevant practices such as water, energy, transport, finance and markets, and cross-cutting areas such as climate change and poverty.

An improved policy environment is also needed to facilitate change. As noted in Chapter 3, mobilizing development finance is critical but is only part of the puzzle. An enabling environment for investing in urban

The World Bank Group is well-placed to enable a cross-sectoral approach to making cities resilient.

resilience also requires proper policies; good policies and effective regulatory frameworks are also needed to promote resilient cities, e.g. appropriate implementation mechanisms for building regulations. The World Bank Group assists client countries with policy analysis and helps identify opportunities for reform. This is backed up with development policy lending where countries receive financing for budget support in recognition of progress that is being made in policy reforms.

The World Bank Group assists client countries with policy analysis and helps identify opportunities for reform.

**A capacity to leverage resources is critical.**

As climate changes and the world urbanizes, the percentage of WBG commitments going to climate change, disaster risk management and urban development is increasing. These commitments then leverage additional resources from other donors, the private sector, foundations, and civil society. For example, since 2009, the IFC has mobilized USD 4.7 billion from core private sector sources and catalyzed an additional USD 30 billion in co-finance for total climate-related private co-financing of USD 34.7 billion (World Bank 2016b). At COP21, the World Bank made a commitment to increase the climate-related share of its portfolio from 21 percent to 28 percent by 2020 with total financing (including leveraged co-financing) of

potentially USD 29 billion per year. The Bank's ensuing Climate Change Action Plan has laid out how this increase can be achieved on a sector-by-sector basis while simultaneously rebalancing its portfolio to put a greater focus on adaptation and resilience. A specific example of leveraging resources in Istanbul is presented in [Box 4.4](#).

Drawing on a global knowledge base facilitates good practice and sharing of experience.

Several hundred professional staff spread across six regions are currently working on issues of urban resilience. They represent a networked repository of experience and knowledge about various aspects of what makes cities resilient. Internal and external partnerships, which are elaborated below, are another pathway for

BOX 4.5: Using Analysis for Safe and Resilient Cities in Ethiopia

Ethiopia has one of the fastest growing urban populations in the world. It is projected to triple from 15 million in 2012 to 42 million in 2034, growing at 5.4 percent a year. The CityStrength Diagnostic approach that was developed and successfully piloted in Addis Ababa in early 2015 informed the Government of Ethiopia's decision to scale up the urban resilience technical assistance (TA) program to nine other regional capitals - Adama, Assosa, Bahir Dar, Gambella, Harar, Hawassa, Jigjiga, Mekelle, and Semera-Logia, and Dire Dawa City Administration. This program builds on the CityStrength Diagnostic approach, while improving the rigor of the approach by adding hazard mapping, a review of building framework and a quick assessment of emergency response management capacity in urban areas.

The initial assessment found that all those regions are facing increased exposure to floods and fire. A majority of them are exposed to earthquake risk but are not taking any actions to prepare for an earthquake event. They are all facing a number of urban stresses, including acute water shortages, a housing shortage, an increasing number of traffic accidents, and unemployment. Moreover, these cities are projected to triple in population by 2037, more than tripling their current built up area. These regional capitals are at a crossroads where decisions made today about the type and location of infrastructure, services and buildings will affect the overall safety of the cities and increase in exposure and climate impacts.

Consultative analysis found that substantial savings could be made in lives and future economic losses if investments are made to improve urban resilience. These relate both to the long term cost savings in urban services and resilient infrastructure development, and the safeguarding of hard earned development gains. For example, improved flood management practices (involving compliance with regulatory requirements for land use) would reduce the average annual loss to about USD 93 million from the current level for a net annual savings reduction of about USD 230 million each year. As a result, five main priorities areas and investments were identified to enhance resilience in these regional capitals:



- Effective management of rapid urban growth in a risk-sensitive manner focusing on the most vulnerable;
- Better management of floods and water scarcity;
- Improvement of disaster preparedness including fire safety and response;
- Improvement in building a regulatory framework to mitigate seismic risk; and
- enhancement of overall safety of the built environment, and support towards key sectoral priorities.

Source: (World Bank 2016 h)

identifying and sharing good practice. Finally, the Bank can use its convening power to bring diverse partners at the international, national and sub-national levels together to share knowledge, as well as to link demand for urban resilience with supply of finance and know-how.

Importantly, the World Bank Group has demonstrated capacity to pull it all together. With its experience, global knowledge and financing capacity, the Bank is well-positioned to address many of the financing gaps identified in Chapter 3. It has the capacity to crowd in additional private financing by identifying attractive risk/return opportunities, understanding the range of appropriate financial instruments, assisting clients with

The Bank can use its convening power to bring diverse partners at the international, national and sub-national levels together to share knowledge, as well as to link demand for urban resilience with supply of finance and know-how.

the preparation of bankable investments, and advising on complementary policy reforms that are needed for investments to be effective.

4.3 – WORLD BANK SERVICES FOR SUPPORTING URBAN RESILIENCE

Strengthening the resilience of cities – especially of the urban poor – requires interventions at different levels ranging from the individual and household to the national. This includes taking action to reduce impacts or exposure before the shock occurs; it also includes supporting coping capacities immediately afterwards and improving the ability to bounce back, or forward to a more resilient state, in the aftermath. To this end, resilience needs to be understood at different scales:

Individuals and households.

This includes their opportunities to minimize exposure to risk by living in safe locations and in safe houses, and to enhance their adaptive capacity through improved health, knowledge and access to safety nets.

Communities.

This includes a community's capacity to work together on risk reduction – for instance to share information about local risks, to use infrastructure and services (including natural ecosystems) in ways that do not jeopardize their risk-reducing functions, or to provide this infrastructure where governments fail to do so.

The World Bank Group offers a wide range of specialized financing products and services which contribute to urban resilience on the individual / household, community, municipal, and national levels.

Cities.

This includes their capacity to provide risk-reducing infrastructure and services, such as drainage and sanitation systems, all-weather roads, drinking water supply and health care and emergency services. It also includes the potential to quickly repair or restore these in the aftermath of disaster. Implementation of effective land use planning and building code regimes further contribute to the resilience of the built environment.

Countries.

To support city-level interventions, countries can secure and provide the needed financing for urban resilience investments as well as create the policy and institutional environment required to promote private sector investment in urban resilience. As a sovereign, national governments are sometime better able to secure financing for urban resilience investments – be it through multilateral development finance, bonds and guarantees.

This framework is applied below to identify relevant technical assistance and financing options the World Bank Group can offer to bolster urban resilience. The World Bank Group offers a wide range of specialized financing products and services which contribute to urban resilience on the individual / household, community, municipal, and national levels. Importantly, these financial products and services provide opportunities to leverage private capital in order to fill the gap between client needs and available financing from multilateral development institutions like the World Bank Group.

The Bank also offers interested cities and countries a suite of urban resilience financing through several instruments, advisory services and analytics (ASAs), reimbursable advisory services (RASs) as well as technical assistance. Importantly, these

leverage private capital in order to meet the gap in availability of multilateral development finance to city needs. A summary of the technical assistance, financing, insurance, as well as bonds and guarantees available for urban resilience purposes is provided below. A more detailed description of these financing products and services is given in Annex 3.

Technical Assistance

There is a global practice at the World Bank that unites urban and resilience/disaster risk management teams. To fully assist cities in being prepared to cope with shocks and stresses, the task teams collaborate with other Global Practices (e.g. with Health on epidemics, Energy and Water on urban service delivery, Transport on sustainable mobility). This collaboration has resulted in the creation of a Community of Practice around urban resilience to enable cities to identify their vulnerabilities and develop and finance investments to mitigate and adapt. The Bank also has several instruments which promote dialogue within the institution to help serve cities and development partners better, e.g. on urban flooding, fragility and conflict, disaster response, and resilient recovery.

A number of analytical tools and methods have been developed for assessment and prioritization. The World Bank Group has been integrating successful approaches into “tools” that can be utilized to better serve city partners. Most of the tools related to disaster risk have been tested and developed with support from GFDRR,¹⁶ while tools and services related to energy use, land value capture, tax increment financing and municipal finance have been tested in the context of the World Bank’s urban engagements.¹⁷ The Bank also has access to the full range of urban resilience tools that have been developed by external partners and classified through work by UN-Habitat and Joint Work Program on Urban Resilience supported

by the Cities Alliance (<http://resiliencetools.org/tools-overview>). Institutional knowledge of and experience in urban resilience is consolidated by the Global Lead on Resilience so that it can be used throughout the institution. An example of the application of multiple tools to benefit Ethiopian cities is presented in **Box 4.5**.

The World Bank Group has been integrating successful approaches into “tools” that can be utilized to better serve city partners.

The World Bank Group offers technical support and resources to aid subnational governments in strengthening their capacity to capture own-source revenue, improve fiscal management, and enhance their creditworthiness. It also provides grant funding to support project preparation and provide in-depth technical support to build capacity amongst larger cities, in particular, to prepare technical and pre-investment studies needed to create investor-ready projects. The Bank further supports governments as they consider various structures for service delivery, so as to improve alignment of service delivery and capital investment decisions and resource allocation.

Financing Approaches and Modalities

To unlock a greater amount of third-party financing, governments need various kinds of support that the World Bank is well-positioned to provide. This includes: pre-development financing; and technical assistance for capacity building to conceptualize, plan, prepare and negotiate investor-ready resilience projects. Better technical capacity in the public sector would reduce uncertainty and, therefore, the cost of capital for private investors. Support

BOX 4.6: Development Policy Lending for Belo Horizonte

Belo Horizonte, Brazil's sixth largest city, has a high poverty rate which is unevenly distributed throughout the city and is highly correlated with housing conditions, inequality, access to jobs, and gender. The World Bank provided a USD 200 million development policy loan (DPL) to the city in 2013 in support of inclusive urban development to reduce vulnerability of the poor, promote green and sustainable practices, and enhance socially and fiscally sustainable urban governance. The loan built upon ongoing reforms in housing development, resettlement, social programs, climate change adaptation and mitigation, disaster risk management, and results-based management.

During the loan implementation period, the Municipality adopted ambitious participatory decision-making mechanisms to foster direct citizen inclusion and ownership of budget allocation, policy decisions, and planning. The city also embraced state-of-the-art resettlement policies and practices. It spearheaded an innovative approach to reach the most vulnerable families, designing a specific development action plan for those families not reached by existing social programs by tailoring to their specific needs. Finally, the city developed and implemented a municipal climate change action plan and strengthened its disaster early warning and reporting system.

Source: (World Bank, 2015c)



The World Bank Group and its partners have been working to enhance the efficiency of financial flows, by reducing delivery time and/or costs, especially for emergency needs and in crisis situations.

is required to help governments understand the conditions required to attract and retain private capital, and to understand the costs of certain government policies or actions (or inaction, as the case may be). The World Bank Group and its partners have been working to enhance the efficiency of financial flows, by reducing delivery time and/or costs, especially for emergency needs and in crisis situations.

There are various approaches and modalities of structuring urban resilience projects with World Bank Group resources. However, the financing itself is offered through one of three specific instruments: Investment Project Finance (IPF), Development Policy Loans (DPLs) and Program for Results (PforR).

Investment Project Financing (IPF):

Investment project financing (IPF) allows the World Bank to finance projects that aim to promote poverty reduction and sustainable development of member countries. Borrowers may choose the IPF instrument based on their objectives, the results they expect to achieve, and the risks they face. IPF supports projects with defined development objectives, activities, and results, and finances a specific set of expenditure transactions and disburses the proceeds of Bank financing against eligible expenditures.

Development Policy Lending (DPL):

Development policy lending can support policy reforms that emerge from dialogue. Through development policy operations, the Bank supports a country's program of policy and institutional actions that promote growth and sustainable poverty reduction. This type of financing typically provides budget support in recognition of policy and institutional reforms to improve, for example, the investment climate, diversify the economy, create employment, improve public finances, strengthen service delivery, and meet applicable international commitments. Some of these reforms, e.g. improving the investment climate in urban

areas, can contribute to enhanced resilience. Conceivably, a development policy operation could be defined with a primary focus on urban resilience. An example of urban resilience policy lending in Brazil is provided in [Box 4.6](#).

Program for Results (PforR): Similarly, Program for Results (PforR) lending can also support positive policy reform, which promotes urban resilience. By utilizing a country's own institutions and processes, and linking disbursement of funds directly to the achievement of specific program results, the PforR approach helps build capacity in-country, enhances effectiveness and efficiency and leads to achievement of tangible, sustainable program results. PforR is available to all World Bank member countries. Since its creation in 2012, there has been a steady increase in the use of PforR. Between FY12-16, there were 5 approved urban resilience PforR operations totaling USD 1.03 billion of Bank financing. An example includes the Results-based National Urban Development Program - Northern Mountains in Vietnam (USD 250 million). The program development objective is to strengthen the capacity of participating cities to plan, implement and sustain urban infrastructure.

Through development policy operations, the Bank supports a country's program of policy and institutional actions that promote growth and sustainable poverty reduction.

Insurance

The World Bank Group offers a number of insurance products aiming to enhance the resilience of individuals and households, cities and countries. By offsetting the risk associated with not only the occurrence of adverse climate events and disasters, but also project-specific risks which concern private investors interested in financing urban resilience projects, World Bank Group insurance products enable more resilient outcomes. Such insurance instruments include disaster responsive social safety nets, city risk transfer and risk sharing facilities as well as multi-country catastrophe risk pools and credit enhancements play a significant role in bolstering the overall resilience of cities.

Bonds and Guarantees

Bonds and guarantees offered by the World Bank Group are effective ways of incentivizing and raising private capital for urban resilience projects. Examples include guarantees on resilience financing for individuals, households and businesses as well as project bonds and project-based guarantees. At the national level, country clients interested in raising funds for urban resilience projects are able to issue sovereign bonds with MIGA guarantees as well as access partial credit guarantees and policy-based guarantees provided by IBRD. The Global Emerging Markets Local Currency Bond Program within the IFC provides advisory services to countries interested in developing a local currency bond market. Doing so can be an effective tool for raising capital for urban resilience investments.

TABLE 4.1: World Bank Instruments for Urban Resilience

	Technical Assistance	Financing Approaches and Modalities	Insurance	Bonds and Guarantees
INDIVIDUAL/HOUSEHOLD: Financing and services available to individuals or households which contribute to urban resilience	<ul style="list-style-type: none"> Resilient Retrofit of Informal Housing (GSURR) 	<ul style="list-style-type: none"> Housing Finance Climate Adaptation Finance 	<ul style="list-style-type: none"> Disaster Responsive Social Safety Nets 	<ul style="list-style-type: none"> Resilience financing (with MIGA guarantee)
COMMUNITY: Financing and services which contribute to urban resilience, available to communities/ Community-level financing and services which contribute to urban resilience	<ul style="list-style-type: none"> Inclusive Community Resilience (GFDRR) Safer Schools (GFDRR) Code for Resilience (GFDRR) 	<ul style="list-style-type: none"> Community-driven development 		
CITY: Financing and services which contribute to urban resilience, available to cities	<ul style="list-style-type: none"> City Creditworthiness Initiative Sub-national Technical Assistance Program (SNTA) of Public Private Infrastructure Advisory Facility (PPIAF) CURB: Climate Action for Urban Sustainability-Tool for Rapid Assessment of City Energy (TRACE) - ESMAP 	<ul style="list-style-type: none"> Sub-sovereign lending for urban resilience project (with Sovereign Guarantee) Performance-based Contracts 	<ul style="list-style-type: none"> City Risk Transfer (GFDRR/GSURR/ Treasury) Risk Sharing Facilities 	<ul style="list-style-type: none"> Project bond Project-based Guarantees (i.e. loan guarantees and payment guarantees) (MIGA)
COUNTRY: Financing and services which contribute to urban resilience available to countries	<ul style="list-style-type: none"> Public Private Infrastructure Advisory Facility (PPIAF) Efficient Securities Markets Institutional Development (esMid) Program Innovation Lab (GFDRR) Building Regulation for Resilience (GFDRR/ GSURR) 	<ul style="list-style-type: none"> Long-term Finance (IDA/IBRD) Blended Finance (IDA/IBRD/MIGA/IFC/ Donor and Private Capital) Development Policy Loans with Catastrophe Deferred Drawdown Option (CAT-DDO) Program for Results (PforR) Crisis Response Window (CRW) Contingent Emergency Response Component (CERC) Debt convergence (including debt swaps and debt buy-backs) 	<ul style="list-style-type: none"> Multi-country Catastrophe Risk Pools Global Index Insurance Facility - GIIF CCRIF / PCRAFI Non-honoring of Sovereign Financial Obligation (NHSFO) - credit enhancement (MIGA) Private Equity Fund 	<ul style="list-style-type: none"> Sovereign Bonds (with MIGA Guarantee) Social Impact Bond Partial Credit Guarantees (IBRD) Policy-based Guarantees (IBRD) Global Emerging Markets Local Currency Bond Program (Gemloc)

In addition, the World Bank Group has various vehicles through which it is able to crowd-in and raise private capital for urban resilience purposes for country clients. A more detailed description can be found in Annex 3.

World Bank Group Methods of Attracting Additional Capital for Urban Resilience Financing				
Bond Issuance <ul style="list-style-type: none"> Green Bonds Infrastructure Bonds Sukuk (Islamic Bonds) Frontloading (ex. International Finance Facility for Immunization) 	Investment Platforms and Pooled Vehicles <ul style="list-style-type: none"> Asset Management Company (IFC) Global Infrastructure Facility (GIF) Managed Co-Lending Portfolio Program (MCP) (IFC) Prototype Carbon Fund (PCF) 	Donor Contributions <ul style="list-style-type: none"> Climate Investment Funds Concessional Financing Facility (CFF) 	TA and Analytics <ul style="list-style-type: none"> Small Island States Resilience Initiative (SISRI) Doing Business Report (DBR) 	Partnership Building <ul style="list-style-type: none"> Medellin Collaboration for Urban Resilience (MCUR)

4.5 WHAT THE WORLD BANK GROUP WILL DO DIFFERENTLY TO MAKE CITIES MORE RESILIENT

Resilient Cities Program

The World Bank Group has launched a Resilient Cities Program, which will serve as a 'one stop shop' within the Bank for any business or organization wishing to invest in urban resilience. The Program objective is to enable 50 million people to escape poverty over the next two decades by improving the disaster and climate resilience of the cities where they live and work. This will be achieved by building cities' technical, regulatory, and financial capacity to integrate disaster risk management in territorial and financial planning, and in their investment programs.

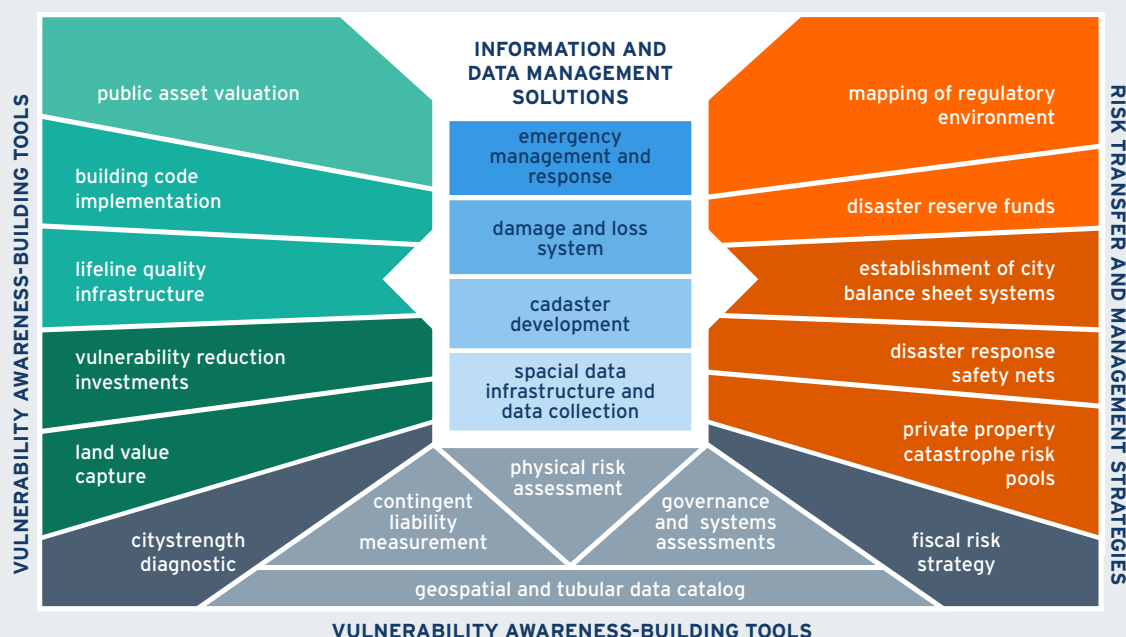
Leveraging private investment will enable the Program to scale up. Achieving higher levels of climate resilience is almost always presented as an insurmountable financing challenge for cities. In fact, many cities around the world have enough economic value that can be tapped to make investing in resilience a strategic choice

rather than a dream. The low-to-negative interest rate climate currently experienced globally adds incentive for private capital, institutional investors and sovereign wealth funds to invest in urban resilience – provided risk is brought to manageable levels and returns on investment can be better assured with MDB financing, and the insurance of guarantees.

Many cities around the world have enough economic value that can be tapped to make investing in resilience a strategic choice rather than a dream.

Over the next two decades, the Program aims to crowd in USD 500 billion in private capital to finance resilient infrastructure and services that will contribute to the elimination

Figure 4.3: Sample menu of options for urban resilience investments



of poverty and adaptation to climate change in 500 cities, benefitting one billion people.

To achieve these ambitions of leveraging and impact, the World Bank Group would need to make more use of efficient financial instruments and double its current level of lending for urban resilience to something on the order of USD 4 billion per year.

The Cities Resilience Program will help create an enabling environment.

The core of the program provides grant resources for technical assistance activities to city governments to create an enabling environment for:

- risk reduction;
- improvement of implementation mechanisms of building regulations and construction practices across sectors;
- inclusion of risk management in territorial planning, and regulatory and financial enhancements to enable city access to credit; and
- the preparation of resilience-boosting projects so that they are bankable and ready for investment by the private sector.

These activities will be directly linked to ongoing and planned infrastructure investment programs or regulatory reforms, to ensure scale and long-term impact. A menu of options in each of these areas is presented in Figure 4.3.

A phased approach will be used during the first ten years of the Program.

In the first five years, the program seeks to engage 40 cities in the development of comprehensive resilience plans or to help implement existing ones, integrated with their other major planning instruments. It will help them match these plans with a viable financing

In the first 10 years, the program will leverage USD 4 billion in MDB financing, crowd-in USD 4 billion in private capital and put at least 20 cities on the path to access private capital for resilience investments.

BOX 4.7: Partnering to Enhance Resilience in Metropolitan Accra

The 4.4 million people living in the Greater Accra Metropolitan Area (GAMA) in Ghana face resilience challenges ranging from floods to inadequate solid waste management. These are exacerbated by fragmentation across 16 jurisdictions.



After the disastrous floods in June 2015, which affected more than 50,000 people in Greater Accra, the World Bank developed a technical assistance program to help the Government in achieving greater urban resilience in the GAMA region. This assistance is being provided with a range of internal and external partners: the Global Facility for Disaster Reduction and Recovery is providing financing; the International Finance Corporation is assisting with risk insurance; the Climate Investment Readiness Partnership is supporting a dialogue on climate change adaptation, disaster risk reduction and an investment framework; and the Rockefeller Foundation - 100 Resilient Cities Initiative, the Japan International Cooperation Agency, Cities Alliance and UN-Habitat are also coordinating technical support. (World Bank 2016e)

strategy. In the first 10 years, the program will leverage USD 4 billion in MDB financing, crowd-in USD 4 billion in private capital and put at least 20 cities on the path to access private capital for resilience investments.

The first year of the Program will focus on four areas. The key activities will be to:

- **Develop and refine tools for the Program.** These include developing indicators to measure poverty and welfare and asset risks at city level, and a city-level poverty-DRM survey instrument.
- **Leveraging private capital.** This means engaging with investment industry groups and cities to define resilient infrastructure investments, and constructing a global overview of cities on the basis of their financial and regulatory readiness to access capital markets.
- **Building a pipeline of city engagements.** Several cities in the developing world have already been identified; more will soon be added.
- **Creating value from existing partnerships and establish new partnerships.** The following formal partnerships are expected to start supporting the program in 2017 and 2018: Rockefeller 100 Resilient Cities, C40, Bloomberg Philanthropies, City Climate Finance Leadership Alliance, International Code Council, Transparency International, ICLEI, Medellín Collaboration

for Urban Resilience, and Columbia Business School. Informal conversations on potential partnerships have begun with Stanford University, Blackrock, JP Morgan, Credit Agricole, Veolia, SwissRe, and Arup International. An example of partnership in action is provided in **Box 4.7** for Metropolitan Accra, Ghana and a description of existing internal and external partnerships is provided in Annex 4.

Climate Change Action Plan

The World Bank's Climate Change Action Plan supports the integration of climate into urban planning.

The WBG will support cities directly and by developing tools and knowledge products through the Global Platform for Sustainable Cities, and roll these out in at least 30 cities by 2020. In addition, the WBG will develop and pilot a city-based resilience approach in 15 cities by 2020 to integrate infrastructure development, land use planning, DRM, institutions/governance, social components, and investment. It will also use its multi-sectoral capacity to support integrated urban water management (water resource management, sanitation planning, urban drainage, and related investments). Finally, to ensure consistency between

infrastructure development and urbanization, the WBG will develop and pilot approaches for transit-oriented development in at least five cities by 2020 with support from IFC and MIGA (World Bank, 2016b).

Doing Business Differently

The World Bank will commit resources to make urban resilience a business product line.

In order to mobilize full institutional support for addressing the challenge of resilience in cities, the World Bank will recognize investment in urban resilience as a standard business product. This recognition can then ensure that resources are available for various aspects of work: systematic country diagnostics and country policy frameworks, analytic and advisory services, lending and other financial instruments, and knowledge management. It would also involve the expansion of disaster and climate risk screening from IDA to IBRD projects to ensure that all investments are risk-informed as well as continued use of the resilience screen employed by the IFC. Resources have already been committed by GFDRR to support the scaling up of the Resilient Cities Program and the consolidation of external partnerships through the Medellin Collaboration on Urban Resilience.

Support for broader urban development is needed and will continue.

An enhanced focus on urban resilience does not mean that the World Bank will reduce its support for urban development in other areas. In fact, making cities more productive, efficient and better governed are critical to enhancing overall resilience. Economic growth and shared prosperity will help increase incomes of the urban poor and reduce their vulnerability to shocks and stresses. Better fiscal and financial management can increase the ability of cities and their partners to meet the additional

costs of investing in resilience. Improved urban management, combined with better governance, can help ensure that services and infrastructure reach the poor and vulnerable.

Mainstreaming will enable the scaling up of a more significant urban resilience portfolio.

The 79 core urban resilience projects that have emerged over the last five years (see Annex 2) have grown organically and not strategically. A more strategic and comprehensive approach to investing in resilient cities can be achieved by:

- Mainstreaming the analysis of urban resilience in SCDs, CPFs, national urbanization strategies, and climate strategies by using, for example, the CityStrength diagnostic.
- Using the full range of instruments outlined in Annex 3 to scale up WBG assistance for making cities and the urban poor more resilient.
- Mobilizing resources to create a project preparation facility to assist clients with the additional costs of preparing investments in urban resilience.
- Creating an internal Community of Practice on urban resilience to facilitate the sharing of knowledge, expertise and good practices for analyzing, identifying, prioritizing, preparing, supervising, and evaluating investments and other activities for making cities and the urban poor more resilient.
- Developing guidance and other knowledge products with internal and external partners for preparing investments and leveraging resources across different sectors for city resilience.
- Developing new partnerships with other financiers and sources of technical excellence while strengthening existing relationships.



4.6 IN CONCLUSION

Building resilient cities is a multi-decade task, demanding considerable commitment and resources, but offering exceptional opportunities to cities and investors alike. Here are some critical first steps:

Use this report.

It is a useful reference to the issues which affect the resilience of cities and the urban poor, and a guide to the information, capacity-building and investment tools provided by the World Bank Group and other organizations.

Partner with the World Bank.

Whether you are in a city that seeks to become more resilient or are an investor looking for opportunities to build urban resilience, the World

Bank Group has the capacity and mission to serve as an honest broker to help meet the challenge.

Use the resources provided by the World Bank Group.

Access these through the City Resilience Program at <http://www.worldbank.org/en/topic/urbandevelopment/brief/resilient-cities-program>.

Start now.

City resilience is as we have seen an urgent priority. Building it into our planning processes will preserve the development gains already achieved, lift millions out of poverty and help sustain urban development.

ANNEX 1 – SAMPLE DEFINITIONS OF URBAN RESILIENCE

UN-HABITAT	Resilience refers to the ability of any urban system to withstand and to recover quickly from multiple shocks and stresses and maintain continuity of service. ¹⁸
ICLEI	The capacity of a social or ecological system and its component parts to cope with hazardous shocks and stresses in a timely and efficient manner by responding, adapting, and transforming in ways that restore, maintain, and even improve its essential functions, structures, and identity while retaining the capacity for growth and change. ¹⁹
DFID	Disaster Resilience is the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses - such as earthquakes, drought or violent conflict - without compromising their long-term prospects. ²⁰
ROCKEFELLER FOUNDATION	Resilience is the capacity of individuals, communities and systems to survive, adapt, and grow in the face of stress and shocks, and even transform when conditions require it. ²¹
NYC, A STRONGER MORE RESILIENT NEW YORK	A resilient city is one that is: first, protected by effective defenses and adapted to mitigate most climate impacts; and second, able to bounce back more quickly when those defenses are breached from time to time. ²²
RESILIENTCITY.ORG	A Resilient City is one that has developed capacities to help absorb future shocks and stresses to its social, economic, and technical systems and infrastructures so as to still be able to maintain essentially the same functions, structures, systems, and identity. ²³
WORLD ECONOMIC FORUM, GLOBAL RISKS	A resilient country is “one that has the capability to 1) adapt to changing contexts, 2) withstand sudden shocks and 3) recover to a desired equilibrium, either the previous one or a new one, while preserving the continuity of its operations.” *New term from Global risks report, 2016: ‘Resilience imperative’ – an urgent necessity to find new avenues and more opportunities to mitigate, adapt to and build resilience against global risks and threats through collaboration among different stakeholders. ²⁴
JEB BRUGMANN, FINANCING THE RESILIENT CITY	“Adaptation focuses development resources on mitigating specific risk factors, often without a clear connection to the overall performance of the area as a functioning urban unit or system. Resilience focuses on the reliability and efficiency of performance.” ²⁵
USAID	Resilience is “the ability of people, households, communities, countries and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.” ²⁶
100 RESILIENT CITIES	Urban Resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience. ²⁷
RESILIENCE ALLIANCE	Resilience is the capacity of a social-ecological system to absorb or withstand perturbations and other stressors such that the system remains within the same regime, essentially maintaining its structure and functions. It describes the degree to which the system is capable of self-organization, learning and adaptation (Holling 1973, Gunderson & Holling 2002, Walker et al. 2004). ²⁸

ANNEX 2 – WORLD BANK URBAN RESILIENCE PORTFOLIO

The Urban Resilience portfolio analysis for FY12-16 is divided into two parts:

- core²⁹ urban resilience projects and
- non-core³⁰ urban resilience projects.

In total, the WBG provided USD 26.77 billion in 86 countries that is either directly or indirectly contributing towards improving urban resilience over the last five years. 79 core urban resilience projects were financed in 41 countries, accounting for USD 9.7 billion between FY12-16. In addition, 151 non-core urban resilience projects were supported with financing of USD 17.5 billion during the same period.

Methodology:

1. The time period was for lending operations approved in fiscal years 2012-2016 (i.e., between July 1, 2011 and June 30, 2016).
2. Lending operations included both development policy financing

and investment project financing on IDA and IBRD terms.

3. A primary list of urban resilience projects was developed that mainly focus on disaster risk management and climate change adaptation (Source: GFDRR 2016b)
4. A secondary list of urban projects was derived from a search of 23 selected themes (see Table A1) from the World Bank theme coding system for their possible connection to urban resilience (World Bank 2014a).
5. The master list (primary + secondary list) was filtered for projects that are based in 'urban' areas. The ones that are primarily based in urban areas are referred as 'core' urban resilience projects and the ones that are either partially based in urban area or are regional/ national projects, are referred as 'non-core' urban resilience projects.

Table A1: Non-core urban resilience theme codes

55	Vulnerability Assessment and Monitoring (Social Protection and Risk Management)	68	HIV/AIDS
71	Urban Services and Housing for the Poor (Urban Development)	88	Non-Communicable Diseases and Injuries
82	Environmental Policies and Institutions (Environment and Natural Resources Management)	89	Malaria
85	Water Resource Management (Environment and Natural Resources Management)	92	Tuberculosis
27	Public Expenditure, Financial Management and Procurement	93	Municipal Finance
41	Micro, Small and Medium Enterprise Support	72	Municipal Governance and Institution Building
51	Improving Labor Markets	73	City-Wide Infrastructure and Service Delivery
56	Other Social Protection and Risk Management	102	Urban Economic Development
58	Conflict Prevention and Post-Conflict Reconstruction	103	Global Food Crisis Response
100	Social Inclusion	91	Pollution Management and Environmental Health
64	Other Communicable Diseases	84	Other Environment and Natural Resources Management
	Nutrition and Food Security		

S.no	Approval FY	Project Name
1	2012	Adaptable Program Loan Sao Bernardo Integrated Water Management
2		Coastal Cities & Climate Change
3		Disaster Risk Management and Reconstruction
4		Jakarta Urgent Flood Mitigation Project
5		Medium Cities Development Project
6		Metro Colombo Urban Development
7		Municipal Infrastructure Development Project (Additional Financing)
8		Second National Urban Water Sector Reform Project (Additional Financing)
9		Second Urban Upgrading (VUUP2)
10		Stormwater Management and Climate Change Adaptation Project
11		Upgrading and Greening the Rio de Janeiro Urban Rail System (Additional Financing)

Country	Country	Total Commitment (\$m)
Sao Bernardo	Brazil	20.82
Maputo; Beira; Nacala	Mozambique	120
Port-au-Prince	Haiti	60
Jakarta	Indonesia	139.64
Lao Cai	Vietnam	210
Colombo	Sri Lanka	213
Vose	Tajikistan	11.85
Lagos	Nigeria	99.6
Can Tho	Vietnam	292
Dakar	Senegal	55.6
Rio de Janeiro	Brazil	600

S.no	Approval FY	Project Name
12	2013	Anhui Xuancheng Infrastructure for Industry A1:F81
13		Belo Horizonte Urban Development Policy Loan
14		China: Nanchang Urban Rail Project
15		Cities Support Program
16		Danang Sustainable City Development Project (SCDP)
17		Donsin Transport Infrastructure Proj
18		Emergency Infrast Rehab Add Financing
19		Guangxi Laibin Water Environment
20		Integrated Solid Waste Management Project
21		Jiangxi Poyang Lake Basin and Ecological Economic Zone Small Town Development Project
22		Jiangxi Wuxikou Flood Management Project
23		Liaoning Coastal Economic Zone Urban Infrastructure and Environmental Management Project
24		Ma'anshan Cihu River Basin Improvement Project
25		Managing Natural Hazards Project
26		National Community Empowerment Program In Urban Areas For 2012-2015
27		Productive and Sustainable Cities Development Policy Loan
28		Rio de Janeiro Strengthening Public Sector Management Technical Assistance Project
29		Safer Municipalities
30		Second Urban Infrastructure Project (Additional Financing)
31		Sao Paulo Climate Change, Disaster Risk Management and Transport

City	Country	Total Commitment (\$m)
Xuancheng (Anhui)	China	73.5
Belo Horizonte	Brazil	200
Nanchang	China	250
Cotonou; Kandi	Benin	60
Danang	Vietnam	202.5
Ouagadougou	Burkina Faso	85
Lome	Togo	14
Laibin (Guangxi)	China	80
Baku	Azerbaijan	47.1
Jiangxi	China	150
Jingdezhen (Jiangxi)	China	100
Donggang, Kuandian, Lingyuan, Longcheng, Panjin and Suizhong. (Liaoning) Kuandian, Lingyuan, Longcheng, Panjin and Suizhong.	China	150
Ma'anshan (Anhui)	China	100
TĐnh Ninh Thuận; TĐnh Quảng Bình	Vietnam	150
East Nusa Tenggara; East Java; Bali; Sulawesi; Kalimantan; Maluku Utara; Papua Barat; Maluku; Nusa Tenggara Barat	Indonesia	266
Nationwide	Colombia	150
Rio de Janeiro	Brazil	2.754
San Pedro de Sula; La Ceiba; El Progreso	Honduras	15
La Paz; El Alto; Santa Cruz	Bolivia	24
Sao Paulo	Brazil	300

S.no	Approval FY	Project Name
32	2014	Benin Emergency Urban Environment Project (Additional Financing)
33		Cusco Regional Development
34		Drina Flood Protection Project
35		Greater Maputo Water Supply Expansion Project
36		Haiti - Urban Community Driven Development Project (Additional Financing)
37		Ibadan Urban Flood Management Project
38		Kosovo Energy Efficiency and Renewable Energy Project
39		Niger Disaster Risk Management and Urban Development Project
40		Nigeria Lagos Second State Development Policy Credit
41		Oaxaca Water Supply and Sanitation Modernization
42		Results-based National Urban Development Program - Northern Mountains
43		Second Kampala Institutional and Infrastructure Development Project
44		Second Urban Poverty Reduction Project (PREPUD II)
45		Sri Lanka Strategic Cities Development Project

City	Country	Total Commitment (\$m)
Cotonou	Benin	6.4
Cusco	Peru	35
Bijeljina; Goražde	Bosnia and Herzegovina	24
Maputo	Mozambique	178
Hinche; Mirebalais; Dondon; Milot	Haiti	4.5
Ibadan	Nigeria	200
Ferizaj; Gjakovë; Gjiilan; Mitrovicë; Pejë; Pristina; Prizren	Kosovo	31
Niamey; Diffa	Niger	100
Lagos	Nigeria	200
Oaxaca	Mexico	33
Huyen Dien Bien; Tinh Bac Kan; Tinh Cao Bang; Tinh Hoa Binh; Tinh Thai Nguyen; Tinh Tuyen Quang; Tinh Yen Bai	Vietnam	250
Kampala	Uganda	175
Djibouti	Djibouti	5.6
Digana; Galle; Jaffna; Kandy; Katugastota; Madawala	Sri Lanka	147

S.no	Approval FY	Project Name
46	2015	Bangladesh Urban Resilience Project
47		Benin Emergency Urban Environment Project (Second Additional Financing)
48		Bukhara and Samarkand Sewerage Project (Additional Financing)
49		Chongqing Small Towns Water Environment Management Project
50		Cities And Climate Change PPCR (Additional Financing)
51		Dar Es Salaam Metropolitan Development Project
52		Earthquake Housing Reconstruction Project
53		Goma Airport Safety Improvement Project
54		Second Dushanbe Water Supply Project (Additional Financing)
55		Second Integrated Growth Poles And Corridor Project
56		Senegal Urban Water and Sanitation Project
57		Shaanxi Small Towns Infrastructure
58		Stormwater Management and Climate Change Project (Additional Financing)
59		Tamil Nadu Sustainable Urban Development Program
60		Vanuatu Aviation Investment Project
61		Qinghai Xining Water Environment Management Project

City	Country	Total Commitment (\$m)
Dhaka; Sylhet	Bangladesh	173
Cotonou	Benin	40
Bukhara; Samarkand	Uzbekistan	102.9
Chongqing	China	100
Beira	Mozambique	15.75
Dar es Salaam	Tanzania	300
Madhyamanchal	Nepal	200
Goma	DR Congo	52
Dushanbe	Tajikistan	8.7
Antananarivo; Antsiranana; Fort Dauphin; Toliara	Madagascar	50
Dakar	Senegal	70
Shaanxi province	China	150
Dakar	Senegal	35
Chennai	India	400
Luganville; Port-Vila; Tafea Province	Vanuatu	59.8
Xining	China	150

S.no	Approval FY	Project Name
62	2016	Addis Ababa Urban Land Use and Transport Support Project
63		Bamako Water Supply Project (Additional Financing)
64		Can Tho Urban Development and Resilience
65		Flood Risk Management Support Project for the City of Buenos Aires
66		Hebei Air Pollution Prevention and Control Program
67		Infrastructure and Local Development Project II
68		Infrastructure, Urban Development and Mobility Project
69		Integrated Disaster Risk Management and Resilience Program
70		Morocco Urban Transport Project
71		Strategic Cities Development Project (Additional Financing)
72		Teresina Enhancing Municipal Governance Project (Additional Financing)
73		Urban Development and Poor Neighborhood Upgrading Project
74		Urban Development Project
75		Urban Development Project
76		Urban Infrastructure and Violence Prevention
77		Urban Water and Sanitation Project (Additional Financing)
78		Urban Water Supply and Wastewater Project (Additional Financing)
79		Zanzibar Urban Services Project (Additional Financing)

City	Country	Total Commitment (\$m)
Addis Ababa	Ethiopia	195
Bamako	Mali	50
Can Tho	Vietnam	250
Buenos Aires	Argentina	200
Hebei	China	350
Libreville; Port Gentil; other cities	Gabon	99.75
Ouagadougou; Bobo-Dioulasso; other cities	Burkina Faso	35
Tanger; Tétouan; Fès; Meknès; Rabat; Casablanca; Marrakech; secondary cities	Morocco	200
Casablanca; Agadir; Marrakech; Rabat; Tangier; Fes	Morocco	200
Jaffna; other northern cities	Sri Lanka	46.75
Teresina	Brazil	87.78
Brazzaville; Pointe Noire	Congo	80
Kigali; secondary cities	Rwanda	95
Balykchy; Kerben; Suluktu; Toktogul	Kyrgyz Republic	12
Guatemala City	Guatemala	44.89
Niamey; other cities	Niger	70
Secondary cities (nationwide)	Vietnam	119
Zanzibar	Tanzania	46.75

TOTAL: **9,720.934**

ANNEX 3 – INDIVIDUAL AND HOUSEHOLD LEVEL FINANCING AND SERVICES

Technical assistance

Resilient Retrofit of Informal Housing TA (GSURR / GFDRR):

As local governments and national programs have often been unable to fully address the lack of compliance with building or construction codes to reduce risk exposure of individuals and households that have opted for informal housing solutions, the World Bank Group is able to provide various technical assistance activities, offering services which include:

- development of a typology of informal housing and associated risk profiling;
- preparation and design of a home retrofitting product to mitigate disaster risk while enabling title deed formalization;
- enabling regulatory environment to simplify property formalization processes;
- identifying viable financial instruments for resilient retrofit of informal housing.

Currently, a resilient retrofit of informal housing technical assistance activity is being implemented throughout the Latin America and Caribbean region.

Financing

Housing Finance (IBRD/IDA):

The World Bank Group housing finance team works in coordination with other parts of the World Bank and IFC to provide a comprehensive approach that reaches across the entire housing value chain. The team's focus is on five strategic areas to provide governments in client countries the tools to tackle the challenges listed above. These include:

- building housing finance markets;
- funding housing finance;
- housing finance for the poor;
- supplying affordable housing; and
- housing finance crisis response.

Each of these areas is critical in the building of a sustainable and efficient housing finance system – a system that will benefit people from many income levels and will help them obtain affordable housing. The most important aspect of the work, though, is creating systems that address the needs of households at different income levels, while building a system that can be sustained, scaled up, and oriented to the private sector.

Climate Adaptation Finance (IBRD/IDA/CIF):

In an effort to incentivize individuals, households and businesses to proactively invest in climate adaptation, an intermediary financing institution can leverage a concessional loan from the World Bank Group, or a concessional fund managed by the World Bank Group (e.g. Climate Investment Funds) and provide more affordable financing for households and businesses interested in investing to enhance their resilience. Examples of investments could include hurricane-proof roofs, drainage, rainwater harvesting and structural retrofits. This modality has been piloted in Saint Lucia, through the Climate Adaptation Finance Facility (CAFF) managed by the Saint Lucia Development Bank and financed by the Pilot Program for Climate Resilience (PPCR) managed by the Climate Investment Funds (CIF)

Insurance

Disaster Responsive Safety Nets:

Social safety net (SSN) programs are engaged in providing enhanced protection to poor households that have been affected by natural disasters. They have been designed

to buffer individuals from shocks and equip them to improve their livelihoods and create opportunities to build a better life for themselves and their families. Examples of SSN programs include emergency cash transfers, which help break the cycle of poverty and increased level of socio-economic vulnerability experienced by many poor households post-disaster.

Currently, the Responding to Disasters Together Community of Practice (R2D2) brings together World Bank staff across three separate Global Practices: Social Protection and Labor; Social, Urban, Rural and Resilience; as well as Finance and Markets, while the Inclusive Community Resilience (ICR) thematic program at GFDRR provides grant financing for technical assistance initiatives which assist client countries in establishing and enhancing in-country social protection systems. Technical assistance is being provided to establish disaster responsive social protection systems in Fiji, Jamaica, the Philippines, Tonga, and Vanuatu.

Bonds and guarantees

Resilience Financing (backed by a MIGA Guarantee):

In an effort to enable individuals, households and businesses to access affordable financing for resilience investments, a financial intermediary such as a development bank can leverage financing (either from private or public investors)³¹ made more affordable with a MIGA guarantee. In the case of the Financiera de Desarrollo initiative in Colombia (Findeter), MIGA issued USD 95 million in guarantees to provide coverage against the risk of non-honoring of financial obligations for a period of up to 10 years for a non-shareholder loan from KfW Bankengruppe. This was the first time MIGA provided guarantees to a state-owned enterprise, without a sovereign guarantee. The more competitively priced financing was passed on to end borrowers which included municipalities and other intermediary banks

financing urban infrastructure investments. Findeter financing was channeled towards the “Sustainable and Competitive Cities Program” and is expected to finance between 20-30 sub-projects ranging from urban transportation, social housing, water and sanitation as well as health and education infrastructure.

COMMUNITY LEVEL FINANCING AND SERVICES

Technical assistance

Inclusive Community Resilience (GFDRR):

The Inclusive Community Resilience program was established in 2014 to enhance the World Bank’s engagement with civil society, promote community-led disaster and climate risk management, and to integrate social inclusion and gender into DRM investments. It emphasizes the underlying socio-economic drivers of vulnerability, such as poverty, marginalization, and accountability, and supports governments’ efforts to strengthen local level resilience at a national scale. Examples of technical assistance activities include capacity building for inclusive disaster risk management globally; developing social inclusion and resilience frameworks in Karachi, Pakistan; community-based hazard and risk mapping in the Philippines; as well as leveraging Japanese best practice to empower elders, women and people with disability for resilience in the Philippines and Nepal.

Safer Schools (GFDRR):

The objective of this program is to make school facilities, and the communities they serve, more resilient to natural hazards. Key components of technical assistance activities carried out under this program include:

- building an enabling institutional, policy, and regulatory environment for risk reduction;

- improving school construction practices; and
- monitoring global progress on school safety.

Through the Safer Schools program, GFDRR works with national and sub-national agencies, including Ministries of Finance, Public Works, and Education, to integrate risk considerations into new and existing education sectors. The Facility also collaborates with a wide range of international partners, including United Nations agencies such as UNICEF, UNESCO, and UNISDR; international NGOs such as Build Change, Save the Children, and Plan International; and private sector companies such as Arup. The Safer Schools Program is currently implementing technical assistance activities in eight countries across five regions which include: Armenia, El Salvador, Indonesia, Jamaica, Mozambique, Nepal, Peru and Turkey. Programs in small island states (Saint Lucia, Samoa, Tonga and Vanuatu) are currently in the pipeline.

Code for Resilience:

To strengthen community resilience to natural disasters through innovation, Innovation Lab supports Code for Resilience (CfR), an initiative that partners local technologists with disaster risk management experts to create digital and hardware solutions for DRM and other civic-minded activities. Code for Resilience first identifies country partners willing to commit financial and technical resources to co-invest in developing capacity and tools which leverage technological innovations meant to strengthen community resilience to natural disasters. Examples of activities include:

- identifying a list of technical challenges related to disaster risk assessment and identification, disaster risk reduction and disaster preparedness;
- building capacity by providing tailored training on the use of open source tools and open data to address specific disaster risk management problem statements;
- investing in expertise to refine technology-based solutions to local

disaster risk management challenges;

- adapting existing tools or developing new tools to address locally identified problems; and
- creating communities amongst disaster risk management experts and local technology communities to promote the use of open source technologies, open data, open standards and open platforms.

Financing

Community-driven development financing:

Community Driven Development (CDD) programs operate on the principles of transparency, participation, local empowerment, demand-responsiveness, greater downward accountability, and enhanced local capacity. Experience has shown that when given clear and transparent rules, access to information, appropriate capacity, and financial support, poor people can effectively organize to identify community priorities and address local problems by working in partnership with local governments and other supportive institutions. The World Bank recognizes that CDD approaches and actions are important elements of an effective strategy for poverty reduction and sustainable development. The Bank has supported CDD across a range of low to middle income, and conflict-affected, countries to support a variety of urgent needs. These include water supply and sanitation, post-conflict school and health center construction, nutrition programs for mothers and infants, rural access roads, and support for micro-enterprises. One such project financed by the World Bank Group is Rekompak, the Community-based Settlement Rehabilitation and Reconstruction Project which financed the rebuilding of homes following a volcanic eruption in 2010 close to the town of Yogyakarta in Java Indonesia. Another is the Kapitbisig Laban sa Kahirapan – Comprehensive and Integrated Delivery of Social Services Project (KALAHI-CIDSS), which financed the completion of close to 6,000 projects worth USD 265 million,

benefitting over 1.6 million households in the poorest municipalities and provinces in the Philippines since 2002. Sub-projects financed through this project include small-scale water systems, school buildings, day care centers and health stations, as well as roads and bridges.

Case study: Community development finance support (Archer 2012)

The Asian Coalition for Community Action provides seed funding for community development finance. In the Nong Duang Thung community in Vientiane, Lao PDR, the ACCA conducted its first pilot project, a community housing program. The money was provided through a district savings group allowing for a district-wide mechanism that facilitated development and assisted in land negotiations for squatters. This was the first case of squatters being granted a long-term lease on publicly owned land. Given the threat of eviction, the community developed an upgrading project with the help of community architects. These architects helped to survey and map the settlement, expand the savings group to include all the squatter households, and develop a new development plan.

The development plan brought in water supply, drainage, and electricity and provided for the construction of homes that realigned the onsite lanes. The ACCA provided a budget of USD 40K, of which the community committed USD 10K as a grant for infrastructure upgrading, with the remainder revolved into home improvement loans. To enable the funds to revolve more quickly, and to increase the number of households who could access the money, the community decided that the loans should be kept small, to a maximum of USD 500, and repaid within a six-month period. The interest rate was eight percent, with four percent remaining in the community savings group and four percent moving to the district community development fund to increase its overall lending capital.

Within a few years the community has been able to secure tenure of its land. Community representatives sit on a committee with local officials. Infrastructure is improving and houses are being renovated, while funds are kept available for residents of this and other poor communities in the city to take out further home improvement loans.

CITY-LEVEL FINANCING AND SERVICES

Technical assistance

City Creditworthiness Initiative:

Cities in the developing world are unable to fund their growing infrastructure demand by relying on traditional sources of financing from central governments and international aid organizations alone. Thus, the need to innovate and access private sources of long-term financing through local capital markets and commercial partnerships is becoming a priority. However, in order to access such financing, cities must first prove themselves creditworthy, by managing finances, planning development and engaging citizens using methods that emphasize sustainability and transparency. Currently, only 20 percent of the largest 500 cities in the developing world are creditworthy – severely constricting their capacity to finance investments in public infrastructure. Supporting cities towards creditworthiness is a crucial first step in unlocking larger, longer-term sustainable investments that provide critical services to resident populations through climate-smart urban development. The City Creditworthiness Initiative helps cities achieve higher creditworthiness by

- strengthening financial performance;
- developing an enabling legal and regulatory, institutional and policy framework for responsible sub-national borrowing;

- improving the demand side of financing by developing sound, climate-smart projects; and
- improving the 'supply' side of financing by engaging with private sector investors.

To help achieve these aims, the Initiative has established City Creditworthiness Academies and Implementation Programs. The initiative has a goal of assisting 300 cities in 60 low- and middle-income countries to enhance own source revenues, implement climate-smart capital investments plans, improve their credit ratings, structure their PPPs projects, and utilize tax increment financing. Implementing partners include: C40 Network, UN-Habitat, Findeter, Municipal Institute of Learning (MILE), and the Korean Development Institute. Core funding partners include the Public Private Infrastructure Advisory Facility (PPIAF), Korean Green Growth Partnership, and the Rockefeller Foundation. Cities participating in the Initiative should see improved municipal services; strengthened fundamentals; improved creditworthiness; and increased access to local financing.

Sub-national Technical Assistance Program (SNTA) (PPIAF)³²:

PPIAF helps build the capacity of government officials to prepare and enter into PPP arrangements with private partners. This work can include reforms to institutions, policies, and legal/regulatory frameworks necessary for sustainable PPPs. PPIAF's Sub-National Technical Assistance (SNTA) Program under PPIAF is uniquely qualified to help municipal officials and cities respond to some of the key challenges associated with urbanization and decentralization. Through SNTA, PPIAF supports sub-national entities' access to private financing – for example, through Municipal Bonds. These are a powerful capital allocation tool used by cities in many developed countries to build and maintain urban infrastructure, but have so far been untapped in many developing countries.

SNTA's ultimate target is financial transactions involving bonds or bank loans to help utilities or municipalities access market-based finance without sovereign guarantees to tackle the urbanization problem developing countries face.

CURB: Climate Action for Urban Sustainability:

A new planning tool launched by the World Bank in partnership with C40 Cities and the Compact of Mayors and other partners, Climate Action for Urban Sustainability (CURB) is a decision-support tool meant to provide tailored analysis to help identify, prioritize, and plan cost-effective and efficient ways to reduce carbon emissions. Relying on city-specific data to estimate cost, feasibility and impact of a range of climate actions under different scenarios, CURB:

- explores an array of climate-smart options – from more efficient transport systems to retrofitted buildings;
- defines what goals are realistic;
- simulates technology and policy changes to assess the best course of action; and
- analyzes project financials to determine cost-savings and returns on investment.

These smart investment decisions can in turn help cities create jobs, improve livelihoods, and build up resilience to climate risks – especially for the poor and vulnerable.

One of the notable features of CURB is proxy data: if a city is missing data or other specific information, it allows officials to use data from peer cities or countries to plan targeted approaches. As a result, all cities can use CURB's capabilities to their full potential, regardless of size or income level. It is one of the first free tools of this sort that can be applied comprehensively across a range of sectors for cities in both developing and developed countries. More than 100 cities across the world have plans to deploy the CURB tool including Buenos Aires, Johannesburg, Bangalore, and Chennai – amongst others.

Tool for Rapid Assessment of City Energy (TRACE) - ESMAP:

A decision-support tool utilized by the Energy Sector Management Assistance Program (ESMAP), TRACE is a decision-support tool designed to help cities quickly identify under-performing sectors, evaluate improvement and cost-saving potential, and prioritize sectors and actions for energy efficiency (EE) intervention. It covers six municipal sectors: passenger transport, municipal buildings, water and waste water, public lighting, solid waste, and power and heat. It consists of three modules:

- an energy benchmarking module which compares key performance indicators (KPIs) among peer cities;
- a sector prioritization module which identifies sectors that offer the greatest potential with respect to energy-cost savings; and
- an intervention selection module which functions like a “playbook” of tried-and-tested EE measures and helps select locally appropriate EE interventions.

TRACE is designed with the intention to involve city decision makers in the deployment process. It starts with benchmark data collection, goes through an on-location assessment involving experts and decision makers, and ends with a final report to city authorities with recommendations of EE interventions tailored to the city's individual context.

Financing

Sub-sovereign lending (with Sovereign Guarantee):

While IBRD and IDA generally tend to lend to national governments, the World Bank Group also lends directly to sub-national government such as states in federal republics and some local governments. However, in such cases, while financing or loan agreements are signed directly between sub-national governments and the World Bank, the sovereign government

is responsible for guaranteeing the loan will be repaid. An example of such is the Buenos Aires Infrastructure Sustainable Investment Development Project (USD 264 million), whereby the borrower was the Province of Buenos Aires with a guarantee from the Argentine national government. The development objectives (PDOs) of this project were to:

- enhance the provision of water and sewerage services for the benefit of low-income people, in particular for those people living in highly vulnerable areas;
- improve high priority road segments of the Borrower's road network;
- mitigate urban flooding; and
- support the reactivation of the Borrower's economy and strengthen its regional competitiveness.

Performance-based Contracts:

The use of performance-based contracts can help ensure that the maintenance and rehabilitation of a road or transport system is included and budgeted for in the construction contract to incentivize better developer performance. This can help cities mobilize additional financing to support long-term rehabilitation of such investments. An example of a successful performance-based contract is the Bahia Road Rehabilitation and Maintenance Project. In an effort to explore new options for road financing, the World Bank provided financing and technical assistance to rehabilitate and maintain work through performance-based contracts for rehabilitation and road maintenance (CREMA) on about 1685 km of identified roads, leveraging the investment to secure private capital to pay for continued operation, maintenance and rehabilitation of the infrastructure. Provision was made to ensure that the rehabilitated road would be able to withstand the impact of high intensity climate events such as excess rainfall and floods. The International Finance Corporation (IFC) provided technical advisory support in structuring the contract and in defining the detailed specifications of the CREMA contract.

Insurance

City Risk Transfer (GFDRR/GSURR/Treasury):

Building on the success of on-going national-level engagements on catastrophe risk pooling and transfer, the proposed technical assistance will engage municipalities interested in transferring catastrophic risk to the private reinsurance market, with the World Bank Group as an intermediary. By engaging at the sub-national level in up to six cities globally, the technical assistance will work with credit-worthy cities in the developing world with strong national-level backing to pursue this agenda. It aims to:

- enhance understanding of a city's resource needs to effectively respond to a disaster;
- strengthen ex-ante planning and management in response to emergencies and disasters;
- strengthen the management and execution of budgetary resources post-disaster for emergency response, recovery, and reconstruction of public infrastructure; and
- enhance coordination of emergency response and management from the national to municipal levels of government.

Risk Sharing Facilities:

These financing mechanisms allow a client to sell a portion of the risk associated with a pool of assets. The assets typically remain on the client's balance sheet and the risk transfer comes from a partial guarantee provided by the IFC. In general, the guarantee is available for new assets to be originated by the client using agreed upon underwriting criteria, but in certain situations may also be used for assets that have been already originated. Typically, the client's enters into a risk sharing facility with the IFC to help increase its capacity to originate new assets within an asset class in which the IFC is interested in increasing its own exposure. An example here is the Kenya School Risk Sharing Facility which the IFC extends to eligible private schools financing for construction, purchase, of educational materials,

and other capital expenditures. IFC's USD 2.8 million in loans is intended to improve access to medium term lending for the education sector.

Bonds and guarantees

Project bond:

At the request of the Brazilian Government, the World Bank developed a new "Project Bond" concept to help attract capital market financing to infrastructure projects such as roads, railways, airports and ports. The project bond has been developed at a time when Brazil seeks to leverage twenty years of successful private sector involvement in operating infrastructure assets and concessions to increase the role of the capital market in financing infrastructure. It is aimed at encouraging greater risk sharing and creating new opportunities for domestic and international investors, operators and builders. The bond is expected to be piloted in the coming months to raise financing for a selected number of concessions under the Government's logistics investment program (Programa de Investimento em Logística). The World Bank is ready to consider supporting the pilot issue with new financial commitments of up to USD 500 million. The pilot will be open to the participation of other IFIs, such as the Inter-American Development Bank (IDB).

Project-based Guarantees (MIGA):

Currently, the World Bank Group offers two types of project-based guarantees: (1) loan guarantees, whereby the loan related to debt service default caused by Government's failure to meet specific payments and/ or performance obligations in relation to a project; and, (2) payment guarantees cover defaults on non-loan related payment obligations by the Government. For example, in 2014, MIGA issued USD 361 million in guarantees under this product line to Banco Santander SA of Spain. This guarantee provided specific coverage of Santander's loan to the State of São Paulo for the São Paulo Sustainable Transport Project,

which consists of investments in the state's transport infrastructure and related activities. Total project financing includes a USD 300 million IBRD loan, USD 129 million in State of São Paulo funds as well as financing from Banco Santander.

COUNTRY-LEVEL FINANCING AND SERVICES

Technical assistance

Public Private Infrastructure Advisory Facility (PPIAF):

PPIAF provides technical support to governments in three primary avenues:

- creating enabling environments for private sector participation in infrastructure projects;
- addressing the lack of capacity to transact 'bankable' projects that can attract private investments; and
- growing capacity and awareness through knowledge sharing with developing country governments on key issues and opportunities with private sector infrastructure development.

Importantly, PPIAF's relevance lies in its work on the upstream enabling environment for public-private partnership projects, early stage project conceptualization, and pre-feasibility project development. These are key entry points for integrating climate change sensitivities if the private sector is to invest in infrastructure-related climate change mitigation and adaptation in developing countries. Specifically, government officials need help to plan and prioritize climate-friendly projects, design legal and regulatory environments that facilitate the development of such projects, incorporate specific climate change responses into project designs, find and justify subsidy funding to pay for costs or mitigate risks that make private participation non-viable, and regulate project implementation after contract closure.

Efficient Securities Markets Institutional Development (esMid) Program:

Under the ESMID program, the Swedish International Development Cooperation Agency (Sida), the IFC and the World Bank are jointly working on a project to support the better functioning of securities markets in Africa. ESMID is working with central banks, securities regulators, stock exchanges and other stakeholders to: simplify regulations and procedures for issuing, investing in, and trading bonds; establish and strengthen market infrastructure; build capacity of market participants; facilitate the regionalization of securities markets; and support demonstration and replicable transactions. To date, ESMID has facilitated USD 950 million in new bond issues in East Africa, by streamlining approval and regulatory processes. The time taken to approve bond issues in Kenya and Tanzania has reduced to 45 and 60 days respectively. Such improvements can help to better incentivize urban resilience investments.

Innovation Lab (GFDRR):

To meet the needs of a rapidly changing world, Innovation Lab supports the use of science, technology, and open data in promoting new ideas and the development of original tools to empower decision-makers in vulnerable countries to strengthen their resilience. Recent innovations in the field have enabled better access to disaster and climate risk information and a greater capacity to create, manage, and use this information. Initiatives within the Innovation Lab which can inform decision-making and positively influence the design and planning of urban resilience investments include the Open Data for Resilience Initiative (Open DRI), which applies the concepts of the global open data movement to the challenges of reducing vulnerability to natural hazards and the impacts of climate change.

Activities include:

- GeoNode, a free and open source catalogue of risk data and visualizations;
- Community mapping and OpenStreetMap;
- inaSAFE, a tool providing realistic disaster scenarios and their potential impacts;
- Spatial Impact Assessment which uses satellite imagery and local spatial data sets to efficiently evaluate the entire extent of damage from a disaster and facilitate the development of a financial estimate for a country's recovery. This work supports GFDRR's Resilient Recovery efforts process by providing information before a damage assessment is undertaken and by providing independent validation.
- ThinkHazard!, a new online tool for the development community, developed in collaboration with BRGM (the French geological survey), Camptocamp, and Deltares, which enables development specialists to identify natural hazard information for a given area and incorporate measures to reduce it into project design.

Building Regulations for Resilience Initiative (GFDRR / GSURR):

This new initiative is working to promote a new building policy and regulatory strategy for the World Bank Group. Specifically, it seeks to develop and promote a new stream of activities to increase regulatory capacity and promote a healthier, and safer built environment. By leveraging good practice in building regulation as part of a strategy to reduce both chronic risk and disaster risk, it will set developing countries on the path to effective reform and long-term resilience. Technical assistance activities include developing appropriate building standards for all building structures, including homes, and a focus on the effective implementation of building regulation. Having completed its first pilot in Ethiopia, the Initiative will soon provide technical assistance in countries ranging from Armenia, Jamaica and India.

Financing

Long-term Finance (IDA/IBRD/IFC):

The World Bank Group provides long-term, concessional and non-concessional financing to governments interested in investing in urban resilience. It offers this financing at both concessional and non-concessional rates, through the International Bank for Reconstruction and Development (IBRD) as well as the International Development Association (IDA). Country clients have tapped into both these funding sources when implementing urban resilience projects. In addition, IFC has made equity investments and offered venture capital to private firms implementing resilience projects.

The International Development Association (IDA)

offers financing to low-income countries, extended on terms with substantially more generous interest rates and with typically longer grace periods than are available from the private finance market. Such generous terms have often enabled country clients to invest in urban resilience. IDA often charges little or no interest and repayment periods can be stretched over 25 to 38 years, including a 5- to 10-year grace period. Over the last five years, IDA has provided financing to 14 countries towards 47 urban resilience projects in the amount of USD 4.54 billion.

An example of an IDA-financed urban resilience investment includes the Bangladesh Urban Resilience Project (USD 182 million). The project development objective is to strengthen the capacity of the Government of Bangladesh to respond to emergency events and to strengthen systems to reduce the vulnerability of future building construction to potential disasters in Dhaka and Sylhet.

The International Bank for Reconstruction and Development (IBRD)

offers financing to middle-income countries and some creditworthy low-income governments at a market-based interest rate. While middle-income countries are able to borrow at non-concessional terms, these are still less expensive and have longer grace periods than commercial loans. Over the last five years, IBRD has provided financing to 28 countries towards 31 urban resilience projects in the amount of USD 4.76 billion.

An example of an IBRD-financed urban resilience investment includes the Istanbul Seismic Risk Mitigation Project (USD 400 million). The project is aimed at improving the city's preparedness for a potential earthquake, enhancing the institutional and technical capacity for disaster management and emergency response, strengthening critical public facilities for earthquake resistance, and supporting measures for better enforcement of building codes. Importantly, this project modality enabled the government to leverage an additional 1.5 billion Euro from other international financing institutions including the European Investment Bank, the Islamic Development Bank, the Council of Europe Development Bank and the Reconstruction Credit Institute of Germany.

Blended Finance (IDA/IBRD/MIGA/ IFC/Donor and Private Capital):

At times, country clients have blended their own resources with IDA and/or IBRD financing as well as with donor contributions to finance a single project. MIGA guaranteed commercial financing can also be blended with other sources of financing.

The Sao Paulo Sustainable Transport Project, for example, brought together USD 300 Million in IBRD finance, USD 129 Million from the Client (State of Sao Paulo), and USD 361 Million in

private finance with a MIGA guarantee. The objective of the project is to improve the state's transport and logistics efficiency and safety while enhancing its capacity in environmental and disaster risk management. It consists of investments by the State of São Paulo in sustainable transportation infrastructure and related activities, specifically the rehabilitation of about 800 kilometers of roads selected for their proximity and connectivity to inland waterway and railways, reconstruction of two bridges to enhance the navigability of the Tiete inland waterway corridor complex, and other works to improve road safety. The national government of Brazil was the intermediary, allowing for on-lending to the State of Sao Paulo. The project combines USD 300 Million in IBRD financing, USD 129 Million in Client financing and USD 361 in private financing backed with a 12-year MIGA non-honoring of sovereign financial obligations (NHSFO) guarantee.

The Can Tho Urban Development and Resilience Project is aimed at reducing flood risk in the urban core area, improve connectivity between the city center and the new low risk urban growth areas, and enhance the capacity of city authorities to manage disaster risk in Can Tho City. Components include:

Flood risk management and environmental sanitation;

Urban corridor development; and

Management systems to improve spatial planning, flood risk management and transport.

The project combines financing from IDA, IBRD and the Client, while also leveraging donor finance from SECO. The project brought together USD 125 million in IDA finance; USD 125 million in IBRD finance, USD 62 million in Client finance and USD 10 million in SECO finance, for a total of USD 322 million.

Development Policy Loans with Catastrophe Deferred Drawdown Option (CAT-DDO):

CAT-DDOs enable countries to plan efficient responses to natural disasters – by serving as a critical source of immediate liquidity following a “soft” trigger such as the declaration of a state of emergency like a natural disaster. CAT-DDOs provide bridge financing to maintain important development programs, while funds from other sources such as donor aid or reconstruction loans are being mobilized. Importantly, CAT-DDOs can only be implemented in countries with a disaster risk management program in place, which helps ensure better managed emergencies in cities. An example is the Colombia Disaster Risk Management Development Policy Loan with a Catastrophe Risk Deferred Drawdown Option (CAT-DDO) (USD 150 Million). Here the development objective was to strengthen the Government’s program for reducing risks resulting from adverse natural events. Key outcomes of the loan include expansion of a hazard monitoring network (e.g. seismic, volcanic, hydromet); resettlement of people living in high hazard zone of the Galeras Volcano; and the successful development of local DRM plans for 338 municipalities. This led the Government of Colombia to develop plans for reaching a total of 790 municipalities in its 2010-2014 National Development Plan. Following its close in 2014, the CAT-DDO proved to be a valuable financial instrument, reassuring both financial markets and the population by reducing the negative effects on markets following the declaration of national states of disaster.

Program for Results (PforR):

PforR’s unique features include using a country’s own institutions and processes, and linking disbursement of funds directly to the achievement of specific program results. This approach helps build capacity within the country, enhances effectiveness and efficiency and leads to achievement of tangible, sustainable program

results. PforR is available to all World Bank member countries. Since its creation in 2012, there has been a steady increase in the use of PforR. As of June 7, 2016, there are 46 approved PforR operations, totaling USD 11.6 billion of Bank financing and supporting USD 55.1 billion of government programs. An example is the USD 250 Million Results-based National Urban Development Program in the Northern Mountains in Vietnam. The program development objective is to strengthen the capacity of participating Northern Mountains cities to plan, implement and sustain urban infrastructure.

Crisis Response Window (CRW):

Crisis Response Window serves as a source of emergency financing of the last resort, providing IDA countries with resources based on country-specific circumstances such as the severity of a crisis or the absence of alternative sources of financing. Such resources are critical in enabling countries to respond to severe economic crises, major natural disasters or public health emergencies and epidemics, by financing safety nets for affected populations or reconstructing basic physical assets destroyed by a natural disaster. For more information, refer to <http://ida.worldbank.org/financing/crisis-response-window>. A specific example in which resources from the Crisis Response Window were accessed in the aftermaths of a natural disaster was the Nepal Earthquake Emergency Response (USD 300 Million). An emergency line of credit of USD 200 Million was provided for housing reconstruction and USD 100 Million for budget support was extended to Nepal following the devastating April 2015 earthquake. The housing reconstruction credit will provide grants to low-income homeowners to rebuild roughly 55,000 homes in rural areas, while budget support credit will help the Government of Nepal expand relief and recovery efforts as well as support policy measures to strengthen the country’s financial sector. Another example was the

Ebola Emergency Response Project (USD 390 Million). The project development objective is to contribute in the short-term to the control of the Ebola Virus Disease (EVD) outbreak and the availability of selected essential health services, and mitigate the socio-economic impact of EVD in Guinea, Liberia, and Sierra Leone. Project components are geared to help operationalize the WHO-led Ebola Response Roadmap and the National Response Plans complementing and working in coordination with other international agencies involved in the emergency response. As such, the support provided under this Project is part of a multi-partner emergency response effort led by the respective countries and coordinated with WHO and the UN.

Contingent Emergency Response Component (CERC):

These provide almost immediate access to bridge financing for recovery and reconstructions needs. As such, they are integrated into World Bank investment projects as a window to allow for quick reallocation of remaining project balances after an eligible emergency has occurred or is about to occur. Importantly, CERCs can be integrated in any type of investment operation, and not just disaster risk reduction or climate change adaptation projects. Since 2011, 63 IBRD and IDA projects in 20 (+11) countries have included an emergency response component.

Debt convergence:

Serving as a way to refinance higher interest loans, debt conversions can be an effective way of freeing up capital for urban resilience investments. These can take the form of debt swaps or debt buy backs provided through the IDA Debt Reduction Facility. Similarly debt buy-backs are available for highly-indebted poor countries (HIPCs) experiencing very high debt repayments, leaving little left in their own budgets to finance critical development programs, including urban resilience investments.

In general, such a mechanism helps countries bring their debt to sustainable levels, while better enabling them to meet their Sustainable Development Goals targets. To this end, the IDA Debt Reduction Facility provides grants to eligible HIPCs to buy back – at significant discount – the debt owed to external, commercial creditors. For more information, refer to <http://www.worldbank.org/en/topic/debt/brief/debt-relief>

Debt Swaps

These serve as an innovative way to replace high interest debt with lower interest IBRD or IDA financing. Swaps with a policy-based guarantee can be utilized as a means to promote positive policy change for resilience. In addition, savings resulting from a swap can be used towards financing a specific urban resilience investment. More recently, clients have been approaching the World Bank with interest in pursuing a debt-for-resilience swap. A potential debt-for-urban-resilience swap could emulate a similar debt-for-nature swap implemented in the Seychelles, whereby The Nature Conservancy mobilized a USD 30 million debt-swap in exchange for the Government of Seychelles' commitment to promote marine conservation and climate change adaptation. To this end, the Indian Ocean's second largest marine reserve is expected to be established (roughly 200,000 square kilometers to be classified as 'replenishment zones') and will improve protection of the marine resources that fuel the island nation's fisheries and tourism sectors.

Insurance

Multi-country Catastrophe Risk Pools:

Multi-country risk pools enable countries to bundle their risk to select types of natural hazards and access disaster insurance from the private reinsurance market. Like a group health plan, pooling catastrophe risk results in reduced premiums and greater access to reinsurance

markets for participating countries. A successful example of multi-country catastrophe risk pooling is the Caribbean Catastrophe Risk Insurance Facility (CCRIF), a multi-country program bringing together 17 Caribbean states and territories and up to 6 Central American countries and the Dominican Republic. CCRIF offers its members parametric insurance coverage, which provides immediate payouts upon exceedance of pre-determined thresholds of a natural hazard event such as a hurricane or earthquake. Thus CCRIF member countries are provided with fast-disbursing liquidity for relief and recovery efforts in the aftermath of disasters generated by natural events. An example of the efficiency of such risk insurance pools was seen in Haiti following the January 2010 earthquake, where the first external money to enter Haiti was a CCRIF payout.

Global Index Insurance Facility (GIIF):

The Global Index Insurance Facility (GIIF) is a multi-donor trust fund supporting the development and growth of local markets (including farmers, pastoralists and micro-entrepreneurs) for weather and disaster index-based insurance in developing countries, primarily Sub-Saharan Africa, Latin America and the Caribbean and Asia Pacific. Index insurance is an innovative approach to insurance provision that pays out benefits on the basis of a pre-determined index (e.g. rainfall level, seismic activity, livestock mortality rates) for loss of assets and investments, primarily working capital, resulting from weather and catastrophic events, without requiring the traditional services of insurance claims assessors (World Bank 2012).

Non-honoring of Sovereign Financial Obligations (NHSFO) - credit enhancement (MIGA):

MIGA's NHSFO coverage provides credit enhancement in transactions involving sovereign and sub-sovereign obligors, when the financial

payment obligation is unconditional, irrevocable and not subject to defenses. To date, the primary beneficiaries of this coverage are commercial lenders that provide private loans to government entities for infrastructure projects are the. For example, NHSFO is covering a brownfield metro rail expansion project in Turkey, which is intended to reduce the traffic congestion, air pollution, and enhance the access of the public transport for the urban population.

Private Equity Funds:

Insurance is provided against the risks faced by private equity investors in developing frontier market economies. These risks include: government stability, civil unrest, and fragile regulatory framework.

Bonds and guarantees

Sovereign Bonds (with MIGA Guarantee):

A bond issuance is an effective tool for raising capital for project investments. Doing so helps diversify sources of financing as well as enables access a broader investor base. However, a challenge faced by many clients stems from the attractiveness of the bonds to private investors. To increase the marketability of a bond, the issuing entity can utilize MIGA guarantees (e.g. non-honoring of financial obligations) to enhance the credit quality of the issue. In Hungary, for example, the Exim Funding Coverage (USD 575 million) was a MIGA guarantee aiming to increase Exim's long-term lending capacity and promote the export activity of mostly small and medium Hungarian companies. This was the first purely "public market" bond issue supported by MIGA coverage and the first time MIGA used its NHSFO coverage for a capital markets transaction. This was also the first time bonds backed by MIGA were rated AAA. And while this focused on SMEs, this modality could be applied to raise capital for an

urban resilience investment through a public bond issuance – be it of a sovereign or sub-sovereign entity, provided it is creditworthy.

Social Impact Bonds:

Social Impact bonds help to convert intractable social issues into investible opportunities. Under this model, impact investors rather than governments provide capital for NGOs and social enterprises to scale programs to help poor and vulnerable populations. Payment to investors is based on achievement of a set of predefined outcomes measured with an impact evaluation. If the outcomes are not achieved, the government is not required to repay investors; as such, the performance risk is transferred to the private sector.

Partial Credit Guarantees (IBRD):

Partial Credit Guarantees (PCGs) catalyze private financial flows to developing countries by mitigating critical government performance risks that the private financiers are reluctant to assume. Guarantees cover private debt against a government's (or government entity's) failure to meet specific obligations to a private project or to meet debt service payments for a public project. They are designed to extend maturity and improve market terms. These guarantees can provide coverage against a number of risks, which are government-related and not of a purely commercial nature, including contractual, regulatory, currency and political.

Policy-based Guarantees (IBRD):

Policy-Based Guarantees covers a specific portion of commercial debt defaults linked to a Government's policy and program implications.

Global Emerging Markets Local

Currency Bond Program (Gemloc):

Gemloc is a USD 5 billion local currency bond for investment in up to 40 emerging bond markets,

launched in October 2007 by the World Bank Group together with private partners. Gemloc supports the development of local currency bond markets in developing countries, and as such helps increase attractiveness of the overall markets for local and global investors.

LEVERAGING INSTRUMENTS

Bond issuance

The World Bank Group (WBG) utilizes its AAA rating and callable capital to issue a number of bonds to raise funds inexpensively in financial markets, and offers this low-cost capital as development finance to its clients. The Bank can raise capital to finance urban resilience investment projects through green bonds, infrastructure bonds and sukuk (Islamic) bonds. In addition, countries can raise capital for urban resilience projects by issuing bonds with MIGA guarantees or advisory support from the World Bank Group.

Green Bonds:

The World Bank Group is one of the largest issuers of green bonds, and provides clients with this low-cost capital to finance climate-related projects. To date, World Bank Treasury has raised over USD 6.3 billion with 66 green bonds in 17 currencies, supporting 50 projects in 17 countries. Similarly, the IFC launched a green bond program in 2010 to help catalyze the market and unlock investment for private sector projects supporting renewable energy and energy efficiency. As of FY15, the IFC's portfolio of climate-smart investments has reached USD 13 billion supporting USD 115 billion worth of projects, with over USD 2 billion of new projects invested in the fiscal year ending June 2015.

Infrastructure Bonds:

Infrastructure bonds can be offered to finance urban resilience infrastructure projects in client countries. Eligible investments include transportation and communication systems, public buildings, public institutions, water and electricity networks. Currently, the World Bank Group is exploring structures to integrating this source of financing early in the project cycle. One option, for example, is to structure a World Bank bond that bridges investors throughout the construction phase to project refinancing. An investor buys the bond that mandatorily converts, at maturity, to a long-term project bond (issued by the construction company) upon successful completion of the construction phase. Should the project not reach completion, the investor will receive a small minimum coupon amount.

Sukkuk (Islamic) Bond:

Sukkuk refers to the Islamic equivalent of bonds, whereby investors own a share of an asset – rather than a share of the debt. Partial ownership of the asset comes with commensurate cash flow and risk. The World Bank Group has previously raised USD 500 million from issuing sukkuk bonds to finance immunization programs and health systems. This modality can be similarly applied to raise capital for urban resilience financing.

Frontloading:

Frontloading makes public funds for development purposes available earlier by issuing bonds on the international capital markets – based upon future expected long-term contributions. Examples include the International Finance Facility for Immunization (IFFIm). The IFF serves as a frontloading instrument of future development aid by the United Kingdom. It relies on long-term ODA commitments as assets that underpin bond issuance in international capital

markets and leverage immediate resources for development assistance. An example of the IFF includes the International Finance Facility for Immunization (IFFIm) supported by long-term, legally binding grants from sovereign donors (e.g. France, Italy, Norway, South Africa, Spain, Sweden, and the United Kingdom). Established in 2006 and having paid some USD 5 billion in assets over 20 years, IFFIm issued the first triple-A rated USD 1 billion bond for immunization programs of the GAVI Alliance. The World Bank serves as IFFIm's Treasury Manager.

Investment platforms and pooled vehicles**Asset Management Company (IFC AMC):**

The Asset Management System (AMC) is the third-party capital manager of the International Finance Corporation (IFC). Bringing together commercial capital with development finance, AMC utilizes its strong governance structure and innovative business model to mobilize and scale-up investment. AMC investors include sovereign wealth funds, pension funds, bilateral and multilateral development finance institutions as well as commercial investors. As of December 2015, AMC's global Infrastructure Fund had USD 1.2 billion in equity commitments, USD 443 million of it committed towards 8 infrastructure investments. These services are primarily available to middle-income countries.

Global Infrastructure Facility (GIF):

Operational since April 2015, the Global Infrastructure Facility (GIF) facilitates the preparation and structuring of complex infrastructure public-private partnerships (PPPs) in emerging market and developing economies. By serving as a global infrastructure platform, GIF can mobilize private sector and institutional investor capital towards urban resilience projects. Currently in its three year 'pilot phase,' GIF is

expected to undertake 10-12 project support activities. Applications for project preparation and transaction structuring support are currently underway. Projects must be aligned with two thematic focus areas, requiring they be climate-smart and trade-enabling. Eligible sectors and sub-sectors include energy, water and sanitation, transport and telecommunications. Three projects are currently in the planning phase: a logistics infrastructure project in Brazil (e.g. federal-level road, airport, port and rail projects); a dry ports development program in Egypt; and a deep-sea port in Georgia. The Inter-American Development Bank, European Bank for Reconstruction and Development and Asian Development Bank are technical partners in these project respectively.

Managed Co-Lending Portfolio Program (MCPPE):

The Managed Co-Lending Portfolio Program (MCPPE) can create a pre-agreed and customized loan portfolio for investors interested in investing in urban resilience. For passive investors seeking to diversify their portfolios and leverage IFC's experience and capabilities in originating and structuring emerging market senior loans, the IFC identifies eligible transactions. It then commits investor funds alongside its own investments, provided on the same terms and conditions. The first MCPPE investor was the People's Bank of China, which signed on in September 2013, with a pledge of USD 3 billion.

Donor contributions

Climate Investment Funds (CIFs):

The Climate Investment Funds (CIFs) consists of two windows. The Clean Technology Fund (CTF) finances renewable energy, energy efficiency and transport projects. The Strategic Climate Fund pilots new approaches with potential for scaled-up, transformation action aimed at a

specific climate change challenge or sectoral response. The SCF finance the Program for Scaling-up Renewable Energy in Low-Income Countries (SREP), and the Pilot Program for Climate Resilience (PPCR). The program provides grants and highly concessional financing (near-zero interest credits, with a grant element of 75 percent) supporting investments related to urban development, infrastructure, enabling environment (e.g. capacity building, policy, regulatory work), coastal zone management, and climate information systems and disaster risk management, amongst other critical sectors.

Concessional Financing Facility:

Launched in October 2015, the Concessional Financing Facility provides a source of concessional financing for Syrian refugees and host communities in Jordan and Lebanon. After receiving USD 140 million in initial grant contributions, and USD 1 billion pledged loans to IBRD that will generate further grant contribution, grants are being offered to support refugee and host communities with two projects totaling over USD 340 million. One of these aims to improve job opportunities for over 200,000 Syrian refugees while financing urgent rehabilitation of municipal infrastructure in Jordan. Internally, the design of the facility brings together colleagues from Development Finance, Legal and Treasury. Externally, the facility brings together representatives from multilateral development banks (e.g. European Investment Bank, European Bank for Reconstruction and Development, Islamic Development Bank) and the United Nations. The Concessional Financing Facility further brings together financing from eight donors: Japan, the United Kingdom, the United States, Germany, Canada, the Netherlands, Norway and the European Union.

Technical assistance and analytics

Small Island States Resilience

Initiative (SISRI):

Launched by the World Bank in September 2014, the Small Island States Resilience Initiative (SISRI) assists small island states in accessing scaled up and more effective financing for resilience. It also aims to reduce the fragmentation of the financial landscape, provide technical assistance to overcome capacity challenges in fiduciary and technical aspects of investments. As 59 percent of SIDS inhabitants live in urban settlements (slightly above the global average), investing in urban resilience will be key to ensuring the twin goals are achieved in SIDS.

Doing Business Report (DBR):

The Doing Business Report series includes annual reports going back to 2004 and provides a wide variety of subnational studies and a number of special reports covering specific regions or topics. The most recent Doing Business 2016: Measuring Regulatory Quality and Efficiency is a World Bank Group flagship publication which measures the regulations that enhance business activity and those that constrain it. Doing Business presents quantitative indicators on business regulations and the protection of property rights that can be compared across 189 economies – from Afghanistan to Zimbabwe – and over time. Doing Business measures regulations affecting 11 areas of the life of a business. Countries interested in increasing their ratings in the Doing Business Report can also receive technical assistance from the IFC to improve the general business climate within their respective country.

ANNEX 4 – EXTERNAL AND INTERNAL PARTNERSHIPS FOR URBAN RESILIENCE

External partnerships that have been developed to date include:

100 Resilient Cities (Rockefeller Foundation):
The Cities Resilience Program has coordinated closely with the 100 Resilient Cities (100RC) initiative pioneered by the Rockefeller Foundation. Upon signing a MoU between 100RC, World Bank Treasury and the World Bank in November 2015, World Bank task team leaders have been identified as focal points for potential collaborations in nearly 30 cities. Collaborations have already begun in cities including Accra, Ghana, and are expected to increase with the recent announcement of 35 new cities joining the 100RC network.

Bloomberg/City Creditworthiness Initiative:

The City Creditworthiness Initiative has partnered with Bloomberg Philanthropies (amongst other partners) to support developing country cities and sub-national authorities successfully structure and close market-based financing transactions for climate-smart infrastructure projects. The primary objective of the initiative is to enhance the financial performance and overall capacity of city clients to deliver better infrastructure services. This will be achieved through:

- city creditworthiness academies meant to provide hands-on learning programs that teach city leaders the fundamentals of creditworthiness and municipal finance; and,
- city creditworthiness implementation programs meant to provide in-depth, multi-year, on-the-job customized technical assistance programs.

C40 Cities Climate Leadership Group:

The World Bank is a partner of C40, a network of the world's megacities committed to addressing climate change. C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. Created and led by cities, C40 is focused on tackling climate change and driving urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, wellbeing and economic opportunities of urban citizens. The Group focuses on topics such as adaptation and water; energy; finance and economic development; measurement and planning; solid waste management; transportation; and urban planning and development.

City Climate Finance Leadership Alliance:

The World Bank is a member of this alliance of over forty leading organizations, comprising governments, foundations, aid agencies, and multilateral development banks, which actively work to mobilize investment into low-carbon and climate-resilient infrastructure in cities and urban areas internationally. Its mission is to catalyze and accelerate additional capital flows to cities, maximize investment in climate smart infrastructure, and close the investment gap in urban areas over the next fifteen years.

Compact of Mayors:

Launched by UN Secretary-General Ban Ki-moon and Special Envoy for Cities and Climate Change Michael R. Bloomberg, the Compact of Mayors works under the leadership of the world's global city networks including C40, ICLEI, and the United Cities and Local Governments (UCLG) – with support from UN-Habitat. The Compact establishes a common platform to capture the impact of cities' collective actions through standardized measurement of emissions and climate risk, and consistent, public reporting of

their efforts. Through the Compact, cities are encouraging direct public and private sector investments by meeting transparent standards that are similar to those followed by national governments (amongst other actions). The World Bank is an endorsing partner of the Compact.

Medellin Collaboration for Urban Resilience:

During the 7th World Urban Forum in Medellin (April 2014), a new alliance of ten UN and non-UN organizations joined forces to build urban resilience and to strengthen the social, economic and environmental fabric of the world's urban spaces. Both the World Bank Group and GFDRR are partners in this Collaboration, whose objectives include:

- fostering harmonization of approaches and tools available to help cities assess their strengths, vulnerabilities and exposure to multiple hazards and threats to build resilience;
- catalyzing access to existing and innovative finance mechanisms, including risk-based instruments to reduce exposure and vulnerability to shocks and increase cities' adaptive capacity; and,
- supporting capacity development of cities to achieve their goals by facilitating direct sharing of best practice and knowledge enhancement.

International Code Council (ICC): With a membership of 50,000 people, the ICC is a prominent nonprofit partner of the Building Regulations for Resilience initiative. It works with the World Bank's Building Regulation for Resilience (BRR) initiative in developing a building regulatory assessment methodology to review the quality of design and implementation mechanisms of land use and building code systems. Joint communications events are organized within the framework of ICC's "Global Forums."

Consortium of European Building Controls (CEBC):

CEBC is a European group of building regulators working towards achieving best practice and improved building safety in Europe. Its member organizations include leading national regulatory agencies and organizations with a stake in building controls. CEBC is providing knowledge support to BRR, while individual institutional members of CEBC contribute to technical assistance and advisory interventions of the BRR program.

US National Fire Protection Association (NFPA):

NFPA is a global nonprofit organization established in 1896 and devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The partnership between the BRR initiative and NFPA involves joint research efforts and operational and knowledge support from the NFPA for technical assistance projects. The program is currently collaborating in Ethiopia and Andhra Pradesh, India.

Transparency International (TI):

Based in Berlin, TI has chapters in 100 countries. It gives voice to the victims and witnesses of corruption and works with governments, businesses and citizens to stop the abuse of power, and bribery. The BRR and TI are currently assessing potential opportunities for collaboration at the country level, with a focus on practices related to the construction industry.

Internal partnerships help strengthen the WBG's capacity to scale up its support for urban resilience.

The City Resilience Program and related work to enhance urban resilience is also being supported by a number of internal partnerships:

Pilot Program for Climate Resilience:

The USD 1.2 billion Pilot Program for Climate Resilience (PPCR), is a funding window of the Climate Investment Funds. Using a two-phase, programmatic approach, the PPCR assists national governments in integrating climate resilience into development planning across sectors and stakeholder groups. Importantly, PPCR provides additional funding to put the plan into action and pilot innovative public and private sector solutions to pressing climate-related risks. A significant portion of PPCR finance has been mobilized towards urban development and infrastructure investments in developing countries.

Global Platform for Sustainable Cities:

In an effort to promote urban sustainability, while recognizing the unique window of opportunity that comes with rapid urbanization, the GEF-supported Sustainable Cities program works with mayors in developing countries seeking to transform cities as inclusive and resilient hubs of growth. The Sustainable Cities program will invest USD 1.5 billion over five years, initially engaging 23 cities in Brazil, China, Cote d'Ivoire, India, Malaysia, Mexico, Paraguay, Peru, Senegal, South Africa and Vietnam. The objective is to promote sustainable urban development through better integrated models of urban design, planning and implementation, and will contribute towards avoiding or reducing more than 100 million metric tons of CO₂ in greenhouse gas emissions.

City Energy Efficiency Transformation Initiative:

A technical assistance program with an initial budget of USD 9 million. Led by the World Bank's Energy Sector Management Assistance Program (ESMAP), the initiative provides support to

help identify, develop, and mobilize financing for transformational investment programs in urban energy efficiency. Its activities include:

- financial and technical support;
- capacity building and e-learning; and
- knowledge creation and exchange.

The initiative builds on ESMAP's extensive work on urban energy efficiency, including support towards city energy diagnostics conducted with ESMAP's Tool for Rapid Assessment of City Energy in nearly 70 cities to help quickly identify potential energy efficiency improvements, target underperforming sectors, and prioritize interventions.

Disaster Risk Financing and Insurance Program (DRFIP):

DRFIP is a leading partner of developing countries seeking to develop and implement comprehensive financial protection strategies. A joint initiative of the World Bank Group's Finance and Markets Global Practice and GFDRR, DRFI was established in 2010 to improve the financial resilience of governments, businesses, and households against natural disasters. The initiative supports governments in the implementation of comprehensive financial protection strategies, and brings together sovereign disaster risk financing, agricultural insurance, property catastrophe risk insurance, and scalable social protection programs. Often, it also helps governments work with the private sector to facilitate public-private partnerships. The four main areas in which the DRFIP works are:

- sovereign disaster risk finance;
- market development;
- analytics; and
- knowledge management and global partnerships.

ENDNOTES

¹Cities account for 82 percent of today's global GDP and will account for an estimated 88 percent by 2025 (CCLFA 2015).

²Thus, this report is not intended to be an in-depth guide for making cities more resilient. This guidance already exists in the form of several excellent publications including:

1. Building Urban Resilience : Principles, Tools, and Practice (World Bank,2013) <http://documents.worldbank.org/curated/en/320741468036883799/pdf/758450PUBOEPI0001300PUBDATE02028013.pdf>
2. Building Regulation for Resilience : Managing Risks for Safer Cities (GFDRR, World Bank 2015) - <https://www.gfdr.org/sites/default/files/publication/BRR%20report.pdf>
3. How To Make Cities More Resilient : A Handbook For Local Government Leaders (UNISDR, 2012) http://www.unisdr.org/files/26462_handbookfinalonlineversion.pdf
4. Integrating Climate Change Into City Development Strategies (UN Habitat, UNEP, World Bank, Cities Alliance and HIS,2015) - <http://unhabitat.org/books/integrating-climate-change-into-city-development-strategies/>
5. Local Governments' Pocket Guide to Resilience (UN Habitat and Cities Alliance 2015) - <http://www.citiesalliance.org/sites/citiesalliance.org/files/Resilience%20handbook%20LOW%20RES.pdf>
6. Building Resilient Cities : From Risk assessment to redevelopment (Ceres, The Next Practice, and the University of Cambridge, 2013) http://icleiusa.org/wp-content/uploads/2015/06/Building-Resilient-Cities_FINAL.pdf

³At the time of publishing the Shepherd et al. study (2013), extremely poor was defined as living on less than USD 1.25 per day.

³While similar to the 2009 UNISDR definition included in the Sendai Framework: "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions," the definition of resilience is slightly broader to address a wider subset of shocks and stresses included in Table 1.1. This includes stresses generated by natural phenomena, technological hazards, and socio-economic risks.

⁴Small- and medium-sized cities are defined as between 300,000 and 500,000 and 500,000 and 5 million respectively.

⁵Thirteen of the most populated cities in the world are coastal trading hubs that are vital in global supply chains, and many of them are exposed to flooding and storms. For example, the estimated exposure of economic assets is expected to increase from its 2005 level of USD 8 billion to USD 544 billion in Dhaka and from USD 84 billion to USD 3.6 trillion in Guangzhou. (UN-Habitat, UNEP and UNISDR 2015, UNISDR 2013)

⁶In a recent survey conducted by the Carbon Disclosure Project, nearly 70 per cent of company respondents identified concerns with business continuity risks to their supply chains and thus risks to their revenue streams due to climate change and the resulting extreme weather events (CDP, 2013). More than half these risks have either already impacted these companies or are expected to do so within the next five years

⁷Public investment was calculated as an average of the annual percentage of public investment in relation to GDP from 2001 to 2011, based on data from the World Bank

⁸These include: (i) limited access to income and employment; (ii) inadequate and insecure living conditions; (iii) poor infrastructure and services; (iv) vulnerability to risks, particularly those associated with living in slums; (v) spatial issues that inhibit mobility and transport; and (vi) inequality closely linked to socio-economic exclusion as well as crime and violence.

⁹The African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Monetary Fund and the World Bank Group

¹¹As they assimilate into urban populations, however, it is likely that these numbers are conservative. And with many governments failing to recognize or support these groups, there are strong disincentives to being counted - from discrimination to forced removal by the authorities.

¹²This is illustrated by the experiences of Pralab, a suburb in Khon Kaen city in Thailand. The expansion of the city's built-up area had increased flood risks to the extent that when Pralab experienced a very heavy flood in 2011, more than half the area's population was evacuated and ended up living in temporary shelter along the highway for two months (Promphakping, et al. 2016).

¹³For instance, the health costs and productivity losses associated with congestion are estimated at 1.5% of regional GDP for London, 4.8% for Jakarta, 7.8% for São Paulo, and up to 15% for Beijing (Gouldson, et al. 2015).

¹⁴This is evident from analyses of impact and from the risk analyses done with the DesInventar methodology that captures the impacts of 'small' disasters that do not get included in disaster databases (ibid, (United Nations 2011). (United Nations 2011, United Nations 2009).

¹⁵If an income-based poverty line is to be used, it needs to be adjusted in each city or district to reflect the local costs of non-food needs. USD 1.25/day (adjusted for purchasing power parity) does not cover the costs of non-food needs in many urban contexts.

¹⁶According to McKinsey, a knowledge deficit exists among fund managers regarding what "investing in infrastructure" actually means and prevents investors from examining such long-term investment decisions at the relevant strategic asset-allocation level. Various research papers have demonstrated the primacy of asset allocation in investment management, and asset-allocation decisions explain most of the variability of investment outcomes.

¹⁷Examples include Building Regulation for Resilience program, the CityStrength methodology, Fiscal Risk Assessment, City Risk Profiles, the Climate Action for Urban Sustainability (CURB) tool, and Preventive Resettlement.

¹⁸Examples include the Tool for Rapid Assessment of City Energy (TRACE), the Creditworthiness Academy, cadaster development, and land value capture as part of transit-oriented development.

¹⁹<http://cityresilience.org/CRPP>

²⁰<http://resilient-cities.iclei.org/resilient-cities-hub-site/resilience-resource-point/glossary-of-key-terms/>

²¹https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/186874/defining-disaster-resilience-approach-paper.pdf

²²<https://www.rockefellerfoundation.org/our-work/topics/resilience/>

²³http://s-media.nyc.gov/agencies/sirr/SIRR_singles_Lo_res.pdf

²⁴<http://www.resilientcity.org/index.cfm?pagepath=Resilience&id=11449>

²⁵<http://www3.weforum.org/docs/Media/TheGlobalRisksReport2016.pdf>

²⁶http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Frontend_user/Report-Financing_Resilient_City-Final.pdf

[City-Final.pdf](#)

²⁷<http://reliefweb.int/sites/reliefweb.int/files/resources/USAIDResiliencePolicyGuidanceDocument.pdf>

²⁸http://www.100resilientcities.org/resilience#/-/_/

²⁹<http://www.resalliance.org/resilience>

³⁰Core projects are based primarily in urban areas

³¹Non-core project are either partially based in urban areas or are national / regional scale resilience projects.

³²MIGA is able to provide guarantees on government lending, provided that the covered loan is extended on commercial terms.

³³Public Private Infrastructure Advisory Facility (PPIAF) is a multi-donor project preparation facility that helps governments of developing and middle-income countries develop infrastructure projects in partnership with the private sector.

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