City STRENGTH
RESILIENT CITIES PROGRAM

ADDIS ABABA, ETHIOPIA
Enhancing Urban Resilience

JULY 2015

WORLD BANK GROUP

GFDRR
Global Facility for Disaster Reduction and Recovery

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THE RESILIENT CITIES PROGRAM was launched by the World Bank Group in December 2013 to help cities strengthen their ability to prepare for and adapt to changing conditions, and to withstand and recover rapidly from disruptions related to climate change, natural disasters, and other shocks and stresses. The Program serves as an umbrella for delivering the analysis, rationale, and support local governments need to make resilience part of their urban management agendas.

THE CITYSTRENGTH DIAGNOSTIC was developed as a means of engaging with cities on the complex issue of resilience by using a holistic approach to identifying priority actions and investments to strengthen urban systems. Designed to be implemented by sectoral specialists, the rapid diagnostic process draws upon ideas and data from a multitude of existing tools. A longer-term goal of CityStrength is to promote alignment in approaches to urban resilience to improve awareness of resilience considerations among local leaders and development partners. Financial and technical support for the development of the Diagnostic was provided by the Global Facility for Disaster Reduction and Recovery (GFDRR).

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Addis Ababa, Ethiopia

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Note to the Reader

Addis Ababa is urbanizing and growing at a rapid pace. The city faces potential shocks and stresses that could hinder it from achieving its development goals. These include urban flooding, fire, earthquakes, rapid urbanization, water scarcity, unemployment, and social vulnerability. In February 2015, Addis Ababa invited a team of specialists from the World Bank Group to implement the CityStrength Diagnostic in close collaboration with local officials, technical staff, and stakeholders. The objective of this publication is to share the findings of the diagnostic and the priority actions and investments agreed with local leaders.

Designed to be accessible to a broad audience, this publication presents the most relevant and actionable information that emerged from the diagnostic process. Although the implementation of CityStrength in Addis Ababa leveraged a substantial collection of studies, research, and plans prepared by multiple development partners, this publication does not go into detail on each. Where applicable, those studies are highlighted within this text and readers are invited to seek out the original files for more in-depth information (see Resources on Addis Ababa at the end of this publication).

CityStrength is an interview-based methodology; as such, a significant portion of the findings captured in this publication are based on statements made by local officials, experts, and stakeholders during the launch workshop, individual and group interviews, and field visits.

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Letter from the Mayor

Ethiopia is engaged in rapid and comprehensive development activities to transition from poverty to sustainable and reliable growth and prosperity. Our cities are projected to play an increasing role in the economic transition of the country. Strengthening urban resilience to multiple shocks and stresses will therefore prove crucial to the success of this transition and to ensure improved living conditions for residents and at the same time increase attractiveness for investments and job creation.

As part of the resilience agenda, Ethiopia plays a prominent role in the struggle to mitigate and adapt to climate change, as shown by the active engagement of the government and its collaboration with multiple actors to reduce the country's vulnerabilities. Climate change impacts in Ethiopia, such as the increase in average temperature and changes in rainfall distribution, exacerbates current vulnerabilities that are highly interlinked with other shocks and stresses such as rapid urbanization. To support our cities in their pursuit of sustainable development it is a necessity as well as an opportunity for our country to embark on a resilient development path.

Addis Ababa is the country's capital and home to 25% of the country's urban population. With the current pace of urbanization, the city's population is expected to double in the coming 10 to 15 years. This presents a number of challenges but also opportunities for the city that need to be better understood. For this reason, we welcomed the World Bank initiative—the CityStrength Diagnostic. Through this process, the Addis Ababa City Government engaged in open dialogue with World Bank specialists and key urban stakeholders about risks in our city, urban growth, delivery of basic services, and vulnerable groups.

It was our wish that this engagement would lead to the identification of specific actionable projects that we can implement with support of the World Bank or other development partners. This document describes the process we undertook and presents the recommended actions and investments to enhance resilience in Addis Ababa.

Ato Deriba Kuma

Mayor of Addis Ababa

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Acronyms

AACG	Addis Ababa City Government
AACRA	Addis Ababa City Roads Authority
AADMP	Addis Ababa Distribution System Master Plan Study
AAWSA	Addis Ababa Water and Sewerage Authority
BoFED	Bureau of Finance and Economic Development
BOLSA	Bureau of Labor and Social Affairs
BRT	Bus Rapid Transit
CCA	Climate Change Adaptation
CSA	Central Statistical Agency
DCC	Distribution Control Centre
DRM	Disaster Risk Management
DRMFSS	Disaster Risk Management and Food Security Sector
DRR	Disaster Risk Reduction
EEA	Ethiopian Electricity Authority
EEP	Ethiopia Electric Power
EEU	Ethiopia Electric Utility
EPA	Environmental Protection Agency
FEPRA	Fire and Emergency Prevention and Rescue Authority
GDP	Gross Domestic Product
GOE	Government of Ethiopia
GTP	Growth and Transformation Plan
LRT	Light Rail Transit
MoFED	Ministry of Finance and Economic Development
MUDHCo	Ministry of Urban Development, Housing, and Construction
NPS-DRM	National Policy and Strategy on Disaster Risk Management
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Cities are vulnerable to many types of shocks and stresses, including natural hazards like storms and sea level rise, but also man-made ones like economic transformation and rapid urbanization. These shocks and stresses have the potential to bring cities to a halt and reverse years of socio-economic development gains. Cities that are to grow and thrive in the future must take steps to address these shocks and stresses. Simply put, a resilient city is one that can adapt to these types of changing conditions and withstand shocks while still providing essential services to its residents. A resilient city can keep moving toward its long-term goals despite the challenges it meets along the way.

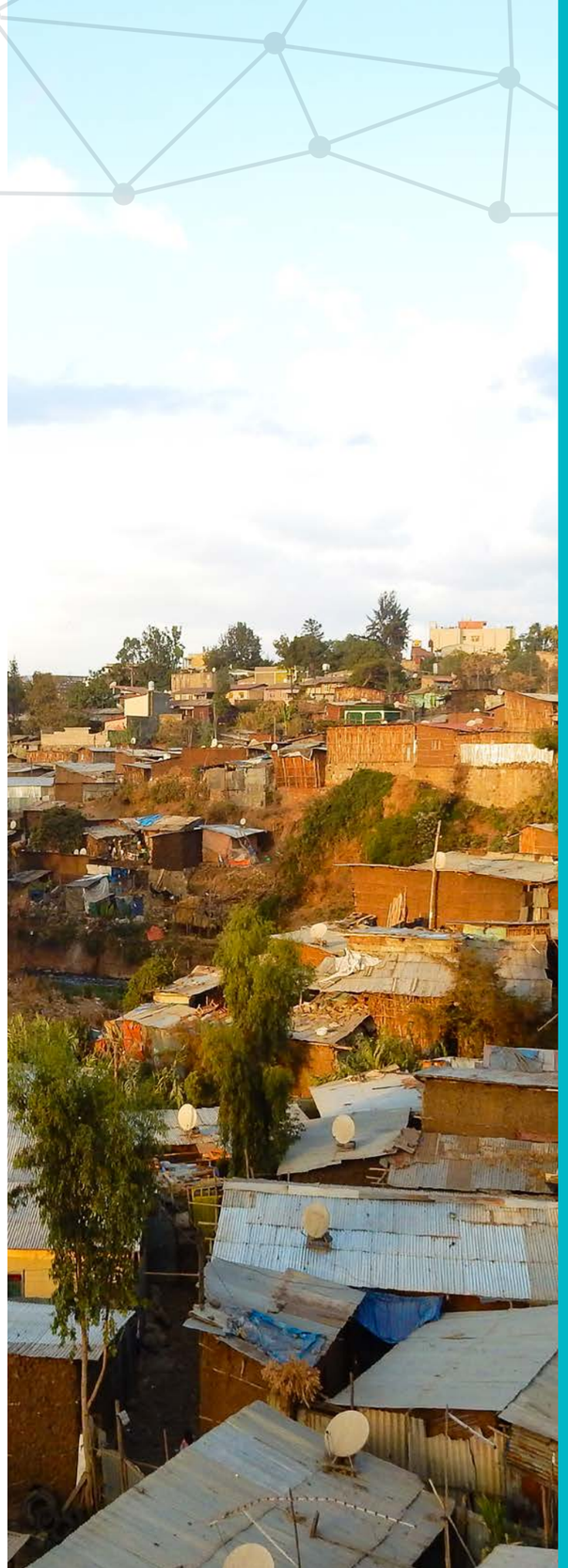
The unprecedented urban growth that Addis Ababa will face over the coming decades could create the agglomeration of people and economies that can catapult the city towards its long-term goals, but if not well managed, it could also exacerbate existing shocks and stresses related to natural hazards, access to basic services, congestion, economic opportunity, and individual well-being. The provision of infrastructure, which underpins urban economic productivity and service delivery, is significantly lagging despite the major investments being made by the city. Moreover, the overall organization of the city government is complex—comprising agencies, authorities, and city and federal government enterprises with a range of roles and responsibilities in constructing and managing infrastructure. This creates substantial demands for coordination. Business as usual is not an option; Addis needs to make a concerted and coordinated effort to be one step ahead of the anticipated growth.

In February 2015, a team of specialists from the World Bank Group worked with government officials, experts and stakeholders in Addis Ababa to identify the priority actions and investments that will enhance the city's resilience to these current and future challenges. They explored options to transform planned or aspirational projects into initiatives that will also enhance the city's resilience. As the largest city in Ethiopia and one of the fastest growing cities in Africa, Addis Ababa plays an important role in promoting the well-being of the country and economic prosperity in the region. For Addis Ababa, efforts to promote greater resilience must be closely aligned with the city's vision to be a safe and livable city, ensure the national goal of becoming a middle-income country by 2025, and become Africa's diplomatic capital.

To identify the bundle of actions and investments needed to enhance resilience in Addis Ababa, the World Bank team used the new CityStrength Diagnostic methodology, a qualitative, rapid diagnostic process that uses a combination of guided interviews, exercises, and review of existing studies to determine sectoral and cross-cutting recommendations. As the second pilot of the methodology, lessons learned from Addis Ababa will inform the future use of CityStrength in Africa and around the world.

How can Addis Ababa become more resilient?

Enhancing resilience in Addis requires actions and investments that are oriented toward implementing existing plans and regulations, establishing clear and capacitated leadership on risk management topics, and investing in infrastructure that meets existing and future needs. Priority actions include: the effective implementation of the Integrated Development Plan and related regulations, establishment of a risk management unit under the Mayor, strengthening of transport agencies (including their role in stormwater management), and strengthening of citizen engagement in disaster risk management. These actions need to be coupled with investments in water supply and sanitation, transit oriented development, flood reduction, energy system upgrades, and urban productive safety nets. As a collection of initiatives, implemented by AACG with strengthened coordination among city departments and development partners, these actions and investments could have a transformational impact on the resilience of the city and provide manifold economic, social, and environmental co-benefits.



Priority Actions

Address unprecedented urban growth by quickly focusing on the implementation of the new Integrated Development Plan. The draft Plan is quite comprehensive and technically sound. Like most cities, the challenge will be its effective implementation and the prioritization of interventions. To catalyze the implementation process, it is recommended that AACG creates an implementation 'business plan' that articulates the phasing of works, costs and financing sources, and roles and responsibilities. This could be accompanied by a strong communication plan that promotes the participation of a broad range of stakeholders including non-state organizations, enhancing transparency, and accountability mechanisms by creating a website for public information dissemination, monitoring, and provision of updates on the Plan's progress.

Establish a disaster risk management and climate change adaptation coordination unit under the Mayor to strengthen, promote, and mainstream risk management initiatives across municipal agencies. At the regional level, Ethiopia is recognized as an emerging leader within Africa on systematically advancing climate change measures and DRM, an example being the adoption of a new National Policy and Strategy on Disaster Risk Management (NPS - DRM) in July 2013. In Addis, the responsibility for implementing the NPS-DRM currently lies with FEPRA, a relatively new institution that does not currently have the capacity to live up to its mandate. Establishing a coordination unit under the Mayor will ensure the desired coordination, assure harmonization of efforts, and ultimately result into improved effectiveness in dealing with risk management and climate change challenges.

Address localized flooding due to surface water run-off by developing a stormwater drainage master plan and supporting AACRA in assuming its new mandate to manage drainage in the city. There is a strong dependency between urban development, roads and drainage, as existing and new roads interrupt natural drainage patterns. Moreover, stormwater drainage infrastructure is often installed under or adjacent to the road network. The intention of the city to give AACRA the mandate to manage drainage in Addis Ababa is therefore logical from a technical standpoint. Run-off has been increasing due to the expanding areas of hard landscape, resulting in more frequent, but short-lived, flash floods, leading to widespread disruption to the road network. An approach to urban drainage needs to be taken at a city-wide scale, and a new urban drainage master plan should be coordinated with the Integrated Development Plan, based on hydraulic modelling that includes anticipated impacts due to climate change. Moreover, the effective operation of the drainage system will require improvements in solid waste management to ensure that drains are not clogged by waste.

Perform an extensive study of the most vulnerable groups with special attention to existing social service programs and access to housing and inform a possible integrated strategy to address the needs of the different vulnerable groups. Currently, the most vulnerable groups in Addis cannot benefit from many of the social services available because they are inaccessible or unaffordable. Analysis is needed to better understand vulnerable groups of the population in Addis and elaborate an integrated strategy to provide them with appropriate support consistent with the overall government agenda. In addition, an inclusive housing strategy, including a review of household affordability and the on- and off-budget subsidies associated with the condominium program, should be developed specifically for Addis given its unique context within the country.

Strengthen citizen engagement efforts using disaster risk management and climate change adaptation as a point of entry. A functioning neighborhood-level early warning system should be established for residential areas along rivers and in densely populated zones. There are limited awareness-raising activities and no early warning system in place – communities are highly vulnerable. The government has frameworks in place for engagement with communities, however, implementation is weak. There are also informal initiatives at the sub-city and community level for service delivery. The city needs to leverage informal initiatives and strengthen formal ones in order to have more efficient engagements. This includes capacity building for city officials and community members alike as well as stronger coordination efforts since there are many fragmented initiatives.

Priority Investments

Address water scarcity with a multi-pronged approach focusing on improved efficiency and protection of the existing supply system, demand management, and identification of additional water sources. Currently, Addis Ababa has two sources of water—surface and groundwater—and failure of either would result in a crisis. Addis Ababa must address the estimated 36.5 percent leakage of water supply in the system as a means of ensuring that more potable water is made available for the population, through a combination of methods, including improved maintenance and faster response to reported breakages. At the same time, the city needs to improve the operational efficiency and monitoring at well fields to maximize their potential and avoid over extraction. In addition to improved efficiency and protection of existing water supply, Addis Ababa will need to develop new sources of water. The examination of surface water sources

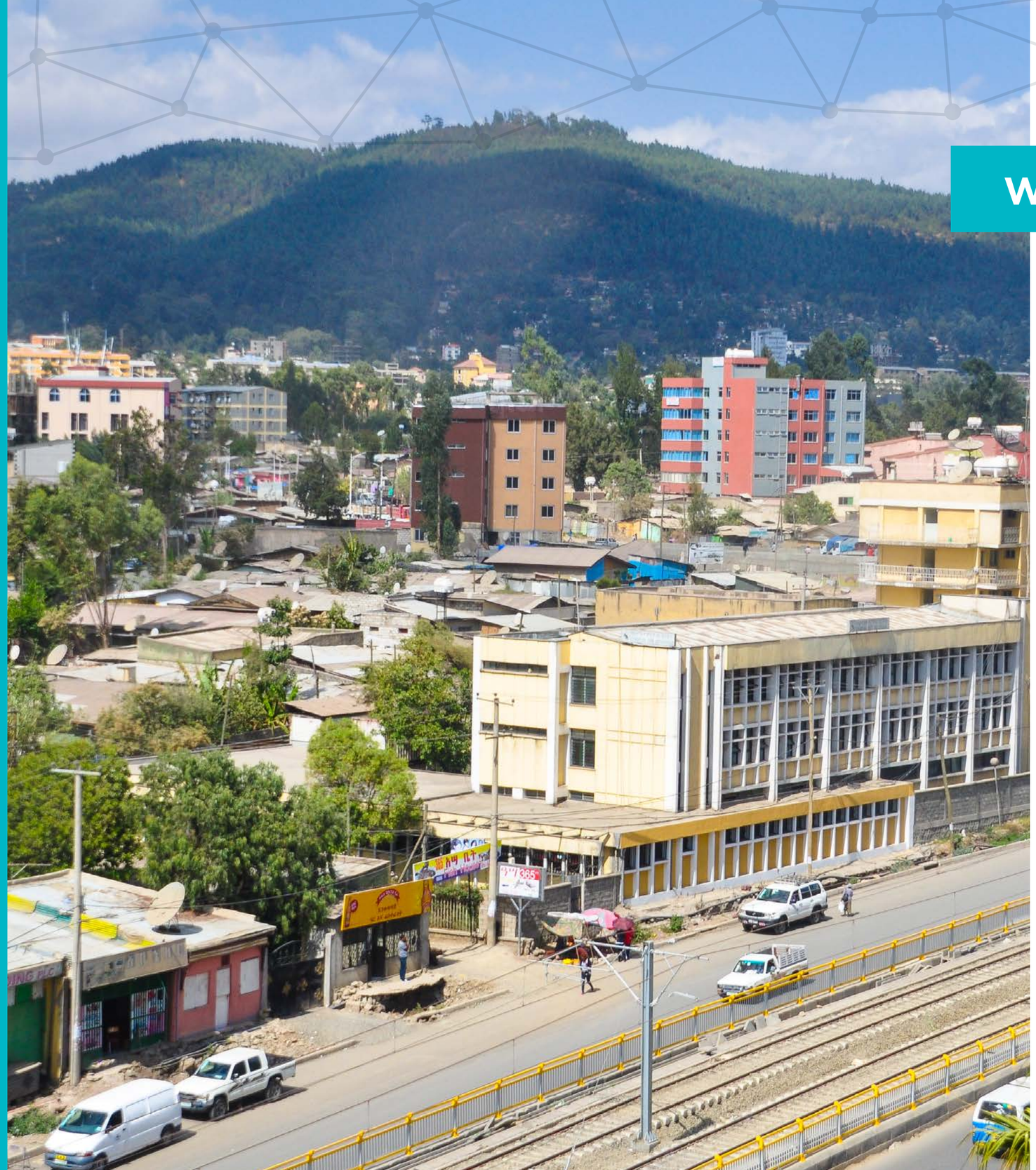
further away from the city should be coupled with exploration of rainwater and stormwater catchments for grey-water uses such as industry, landscaping, and cleaning.

Pilot urban densification using a transit oriented development and integrated municipal management approach.
As part of the implementation of the Integrated Development Plan, AACG should select targeted sites for intensive public investments, private sector engagement, and institutional coordination. These pilots for urban densification should be aligned with transport investments, especially public transportation, and supported by cross-agency technical teams to ensure the quality of local development plans, adequacy of infrastructure delivery, enforcement of building and safety codes, and readiness of private sector to take advantage of opportunities for investment.

Establish mass transport skeletal services to shape metropolitan growth. While upgrading and redevelopment in the city center is laudable and should be pursued, it will not be possible to meet the pace of expected urban growth solely through measures aimed at redevelopment of existing core areas. Efforts need to be taken to ensure that fringe growth is orderly and that viable and affordable transportation options exist. This includes moving quickly to establish mass transport skeletal services to shape metropolitan growth.

Ensure coverage and reliability of basic services, including wastewater collection and treatment and energy distribution. It is estimated that only 25-30% of households in Addis have wastewater collection, either through piped sewer line or vacuum trucks. The city's goal is to reach 50% coverage by 2020. This will require continued investment in piped sewerage and decentralized treatment facilities. Treatment capacity is currently exceeded and excess waste is deposited in water bodies. In regard to energy, stakeholders highlighted service disruption as a stress in the city. The electricity access rate is close to 100%, but outages and interruptions are very frequent. The projected rapid growth in population and intensity of urbanization will require an increase in generation capacity and efficient transmission and distribution system. Both AACG and the utilities should put in place a collaboration mechanism to ensure proper and timely planning of needed infrastructure for basic services to match the city development.

Introduce an effectively targeted productive safety net and complementary livelihoods interventions in Addis Ababa to support extremely poor and vulnerable groups and households impacted by shocks. The delivery of a predictable, timely, adequate and productive safety net through conditional and unconditional transfers is a fundamental building block of urban resilience and can serve as a buffer in the face of economic shocks and natural disasters. Existing poverty alleviation programs in Addis Ababa are fragmented, ineffectively targeted and with very low coverage. Recent analyses have revealed that the urban population is growing rapidly at a rate of 3.8% per annum and unemployment and poverty are both high, estimated at 23.5% and 22% respectively. In addition, the national food poverty head count index is 33.6% on average (34.7% rural and 27.9% in urban areas). As more of the urban poor live in large urban centers, expanding development programs to address key challenges to urban poverty reduction is imperative. Moreover, it is important to note that shocks and stresses impact the poor more severely due to pre-existing vulnerabilities, social inequality, and lack of opportunities.



WHAT IS A RESILIENT CITY?

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.[1] A resilient city can adapt to a variety of shocks and stresses while still providing essential services to its residents, especially the poor and vulnerable.

With most of the global population and capital goods concentrated in urban areas, cities are key to social development and economic prosperity. They are drivers of national economic growth and innovation and act as cultural and creative centers. But urbanization also brings challenges. With a greater concentration of people, assets, and infrastructure in urban areas, an increasingly complex range of shocks and stresses can put in jeopardy human well-being and hard-won development gains.

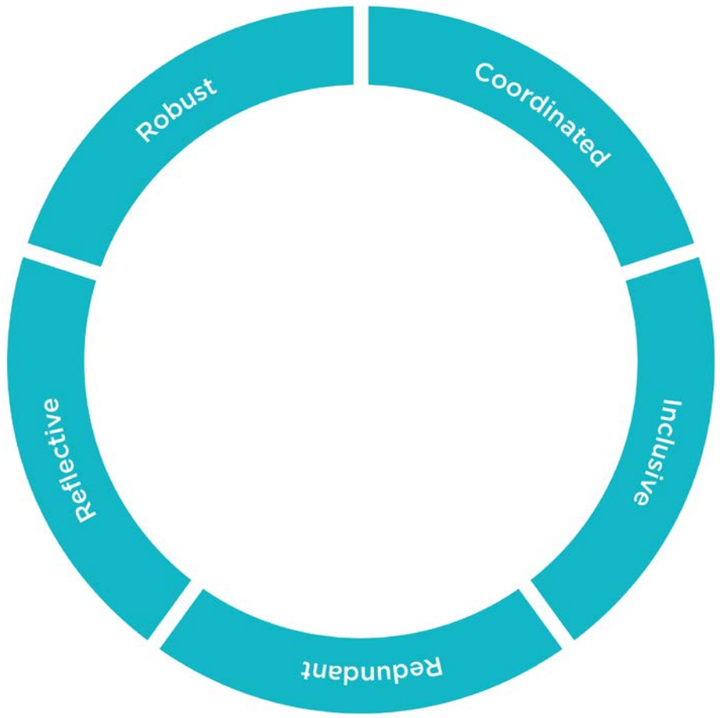
Natural disasters like storms, droughts, and earthquakes are not the only risks that cities face. Cities are also vulnerable to economic downturns, crime and violence, public health epidemics, and infrastructure failure. These shocks and stresses can have devastating effects, bringing some or all of an urban system to a halt, and possibly causing asset damage and loss of life. Acute shocks and chronic stresses can also have a deep and lasting impact on human development. Disaster losses are often linked with, or exacerbated by, poverty and vulnerability of the poor that stem from socio-economic and environmental imbalances.

Cities are complex systems; and, like all systems, a city depends on the smooth functioning of its constituent elements and the larger organization in which it is nested. A city's resilience is therefore affected by the resilience of those smaller and larger systems. Disruptions to the basic services they provide can have cascading impacts well beyond the city itself. The complexity of cities also makes resilience building especially challenging. Focusing on one policy goal, such as climate protection, without considering others can lead to undesirable outcomes. These decisions may come as explicit trade-offs, unintended consequences, or some combination of the two. Building a resilient city therefore requires a holistic, multi-sectoral, and flexible approach to urban development.

1 100 Resilient Cities pioneered by the Rockefeller Foundation.

Qualities of Resilience

What makes a city resilient? The CityStrength Diagnostic is premised on the idea that it is possible to consider how well each element of a city reflects qualities that are typically present in resilient systems. The evidence that underpins the qualities listed below has emerged empirically from research on resilient systems; generally, as well as specifically in cities. They can be used to describe physical assets, human behavior, network systems, and institutional processes.



Robust

Robust systems include well-conceived, constructed and managed physical assets, so that they can withstand the impacts of shocks without significant damage or loss of function. Robust design anticipates potential failures in systems, making provision to ensure failure is predictable, safe, and not disproportionate to the cause. Overreliance on a single asset, cascading failure and design thresholds that might lead to catastrophic collapse if exceeded are actively avoided. An important aspect of robustness is proper operations and maintenance to ensure that systems are functioning properly. (E.g. A building is designed to accommodate a seismic event without collapse or excessive damage.)

Coordinated

Coordination between city systems and agencies means that knowledge is shared, planning is collaborative and strategic, and decision-making is based on investments that are mutually supportive towards a common outcome. Exchange of information between systems enables them to function collectively and respond rapidly through feedback loops occurring throughout the city. (E.g. A coordinated transport systems is not only aligned with urban growth dynamics and land use but also has open communication with other agencies so that it can divert user traffic to different modes of transport based on changing conditions.)

Inclusive

Being inclusive recognizes that risk is perceived differently by different stakeholders and that shocks and stresses affect the most vulnerable the most. An inclusive approach contributes to a sense of shared ownership or joint vision to build a resilient city. This can be achieved through consultation and engagement with a wide range of stakeholders, including the most vulnerable groups, to ensure that systems are more resilient by considering a wider range of vulnerabilities, risk management capacities, and localized information. Equity in access to infrastructure and services underpins social cohesion and opportunity. (E.g. An inclusive budgeting process could help ensure that the allocation of city resources reflects community priorities.)

Redundant

A redundant network or system has a belt and braces approach which includes spare capacity or back-up to accommodate disruption, extreme pressures or surges in demand. Providing diverse ways of achieving a given need or fulfilling a particular function is a means to achieving a redundant system. If one service channel gets disrupted, another can be used. (E.g. A power distribution network is able to rebalance to respond to a surge in demand in a particular area.)

Reflective

Resilient urban systems examine, learn, and evolve based on their past experiences and new information, modifying standards or norms based on emerging evidence rather than seeking permanent solutions based on the status quo. As a result, people and institutions examine and systematically learn from their past experiences, and leverage this learning to inform future decision-making. (E.g. A financial management system might make use of information on past shocks and stresses to improve budget reserving policies.)

CityStrength Diagnostic Methodology

The CityStrength Diagnostic methodology facilitates a dialogue among stakeholders about risks in their city and the performance of urban systems. It helps identify priority actions and investments that will enhance the city's resilience as well as transform planned or aspirational projects into projects that will also help to build resilience. CityStrength stresses a holistic and integrated approach that encourages cross-sectoral collaborations to more efficiently tackle existing issues and to unlock opportunities within the city.

To cover topics within the city and metropolitan area purview, CityStrength Diagnostic modules include Urban Planning and Development, Community and Social Protection, Disaster Risk Management and Climate Change Adaptation, Education, Energy, Environment, Health, Information and Communications Technology, Local Economy, Logistics, Municipal Finance, Solid Waste, Transport, and Water and Sanitation. These modules were created based on a review of about 40 tools and methodologies related to resilience and the analysis of over 600 indicators contained within them.

The CityStrength Diagnostic consists of 5 stages, book-ended by leadership commitment for resilience on the front-end and a longer-term engagement with development partners through financing or technical assistance at the back-end.

Stage One — PRE-DIAGNOSTIC REVIEW

The **first stage** focuses on collecting information and leveraging efforts that have already been undertaken in the city. A review of all relevant studies, reports, or plans developed by the city, the World Bank, or other development partners is conducted. Who prepared it? Why? And how was it used? Key findings are summarized in order to brief participants during the Launch Workshop as well as Bank specialists supporting the implementation of the diagnostic. Specific background studies or data collection initiatives could also be undertaken during this stage depending on the context.

Stage Two — LAUNCH WORKSHOP

The **second stage** is a Launch Workshop. The objectives of the workshop are to 'officially' launch the CityStrength Diagnostic process in the city, to explain the concept of urban resilience, to learn about the city's goals and objectives, to verify the initial findings from the first stage, to introduce the multi-sectoral Bank team, and to engage with a broad set of stakeholders.

Stage Three — INTERVIEWS AND FIELD VISITS

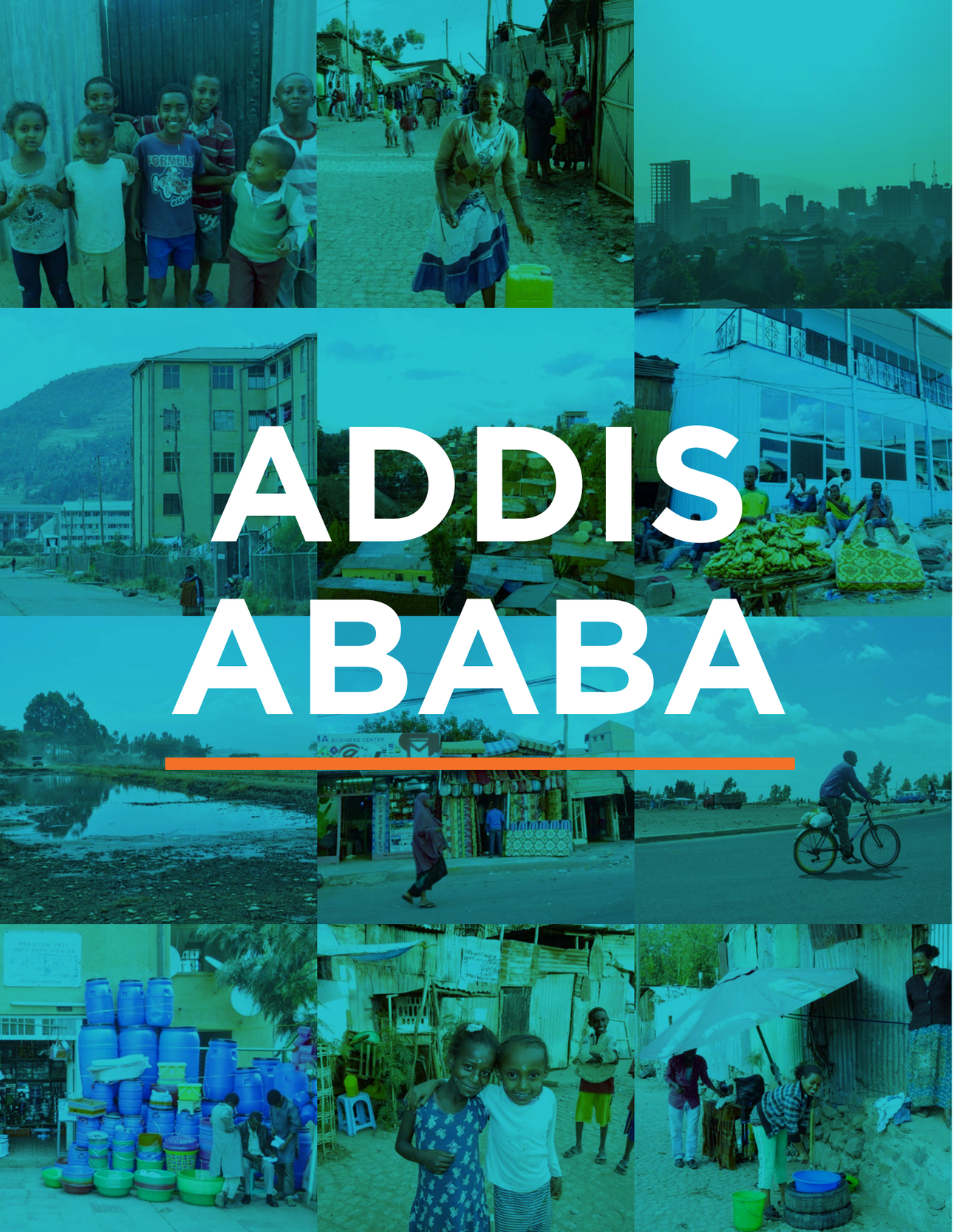
The **third stage** consists of interviews and site visits to help the Bank specialists better understand the challenges and opportunities in the city and to qualitatively assess how well key systems are performing in relation to defined Qualities of Resilience. It is also meant to give the city departments the opportunity to learn about each other's work programs and ongoing resilience activities.

Stage Four — PRIORITIZATION

The **fourth stage** is the identification and prioritization of actions and investments to enhance resilience in the city. This is done using multiple "lenses" to qualitatively identify measures that the Bank specialists recommend as the most important for the city leaders to consider. While the ultimate goal of the CityStrength Diagnostic is to enhance the city's long-term resilience, it is important to understand the nature of any immediate threats to people and assets (Lens 1). It is also crucial to understand dependencies and interdependencies within urban services and systems, which can cause cascading disruption or failure, or compound existing vulnerabilities (Lens 2). Thinking holistically (rather than sectorally) about the city's resilience (Lens 3) is necessary to identify critical gaps or areas of weakness at the city scale. Finally, aligning recommended actions and investments with local goals and objectives (Lens 4) increases the likelihood that the recommendations will have sufficient stakeholder support to become a reality.

Stage Five — DISCUSSION AND NEXT STEPS

The **fifth stage** is a meeting with local leadership and other stakeholders to present the findings of the diagnostic, discuss recommendations, and agree on priorities and next steps.



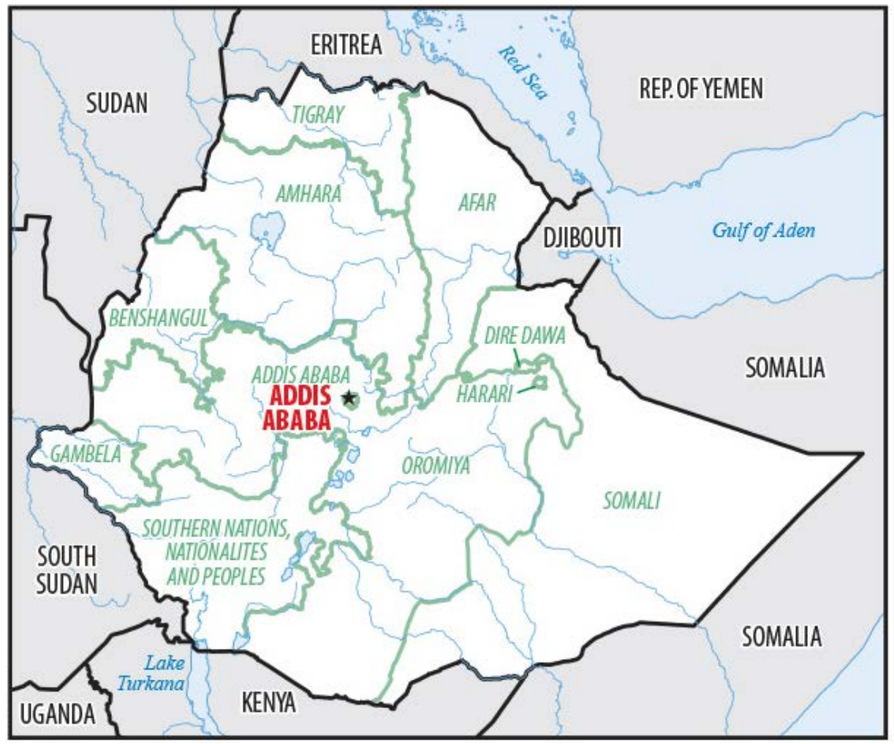
ABOUT ADDIS ABABA

Addis Ababa is home to 25% of the urban population in Ethiopia and is one of the fastest growing cities in Africa. It is the growth engine for Ethiopia and a major pillar in the country's vision to become a middle-income, carbon-neutral, and resilient economy by 2025. Addis Ababa's economy is growing annually by 14%. The city alone currently contributes approximately 50% towards the national GDP, highlighting its strategic role within the overall economic development of the country.

Despite the strong economic growth trends, Addis Ababa faces significant development challenges. For example, unemployment and poverty levels in Addis Ababa remain high, estimated at 23.5% and 22% respectively. More than one in four households report an unemployed adult compared to one in 10 households in other urban areas, and the informal sector employs about 30% of the economically active labor force in the city.

The local government is also struggling to deliver basic services to all its residents, providing clean water to only 44% of the population and sewerage services to less than 30%. Moreover, the physical development patterns witnessed in recent years are driving up the cost of infrastructure delivery. Addis is expanding in a sprawling manner, with growth in urban extent outpacing population growth. The result of this growth is an estimated 46% of vacant or underutilized land. At the same time, the city center has extremely high density (up to 30,000 people per km), concentrating around 30% of the population on 8% of the land, generally with poor living conditions.

Recognizing the strategic importance of Addis Ababa, the government is taking steps to address important urban issues such as improved land-use and transportation planning, the development of low-income housing, expansion of wastewater collection and treatment facilities, efficiency enhancements to the water supply system, and establishment of an urban safety net.



GOALS

The Addis Ababa and Oromia Special Zone Integrated Development Master Plan presents a vision for the future of Addis:

- **TO BE A SAFE AND LIVEABLE CITY,**
- **TO ENSURE THE NATIONAL GOAL OF BECOMING A MIDDLE-INCOME COUNTRY, AND**
- **TO BECOME AFRICA'S DIPLOMATIC CAPITAL AND A WORLD CLASS CITY.**

QUICK FACTS

Population 2013
3.6 million[2]

Population 2037
9.8 million[3]

Population Growth Rate
3.8%/annum[4]

Built-up Land Area
647 km2

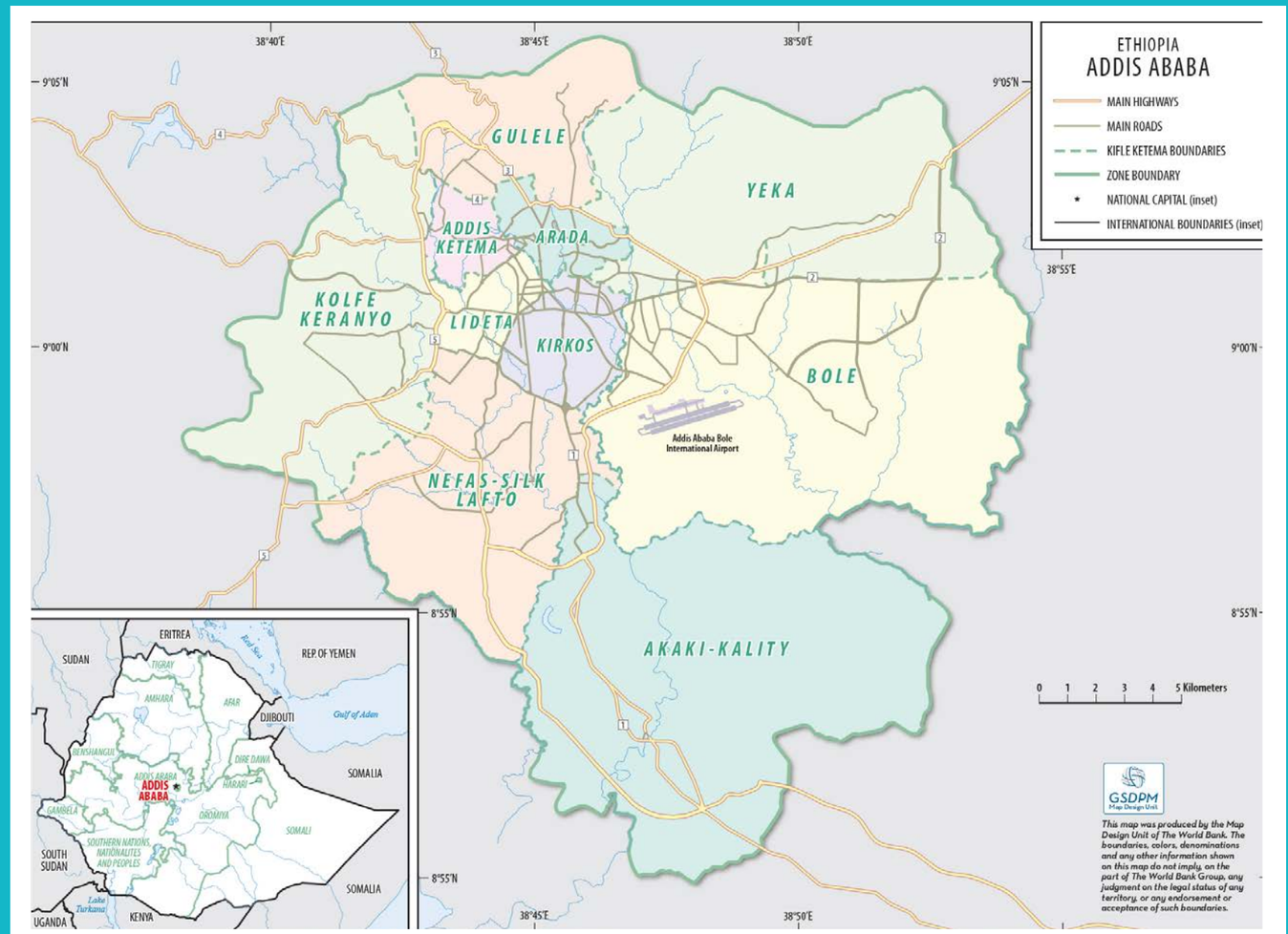
Sources:

2 3 4 Central Statistical Agency

5 The report acknowledges that the data on safe water access in Addis Ababa, as indicated in the 2015 Ethiopia Urbanization Review, stems from 2012. At the time of publication there may be more up to date figures available.

6 Growth and Transformation Plan II, 2015

ADDIS ABABA METRO AREA



BASIC SERVICES

Access to Electricity
100%

Access to Safe Water Supply
44%[5]

Access to Piped Sewerage
10%[6]

Solid Waste Collected
63%[7]

Water Consumption per person per day
40 liters[8]

LOCAL ECONOMY

Poverty Rate
22%[9]

Unemployment Rate
23.5%[10]

Employment in the Informal Sector
30%[11]

GDP Growth
14%[12]

CLIMATE CHANGE

Increase in Mean Annual Rainfall by 2050
35-50%[13]

Increase in Mean Annual Temperatures by 2050
1.5 °C[14]

7 Data collected by SuDCA Development Consultants for evaluation of municipal delivery services of cities participating in the ULGDP, for the FY 2011/2012

8 11 Ethiopia Urbanization Review, 2015

9 10 12 Growth and Transformation Plan II, 2015

13 14 Climate Change and Vulnerability of African Cities, 2013

Land Underused or Vacant
46% [15]

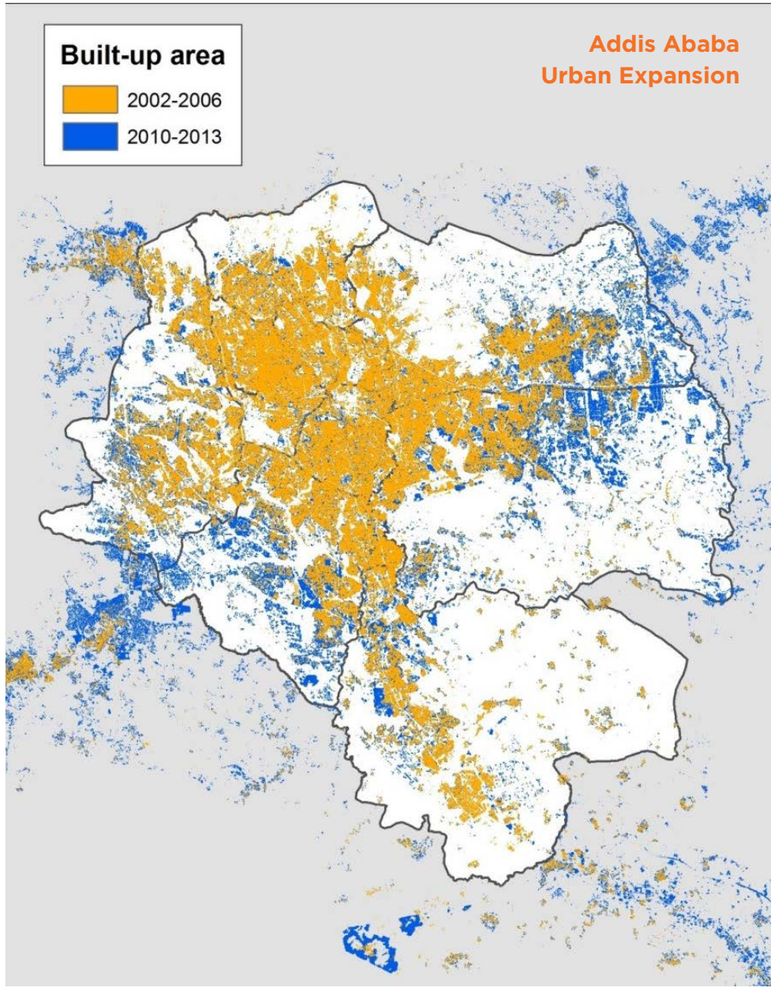
Total Housing Stock Comprised of Low Quality Housing
70-80% [16]

Land Allocated to Streets
20% [17]

Urban Land Expansion Rate
3.2% per year [18]

Maximum Density
30,000 people/km2 [19]

Addis Ababa Urbanization Along Road Corridors



15 18 19 Ethiopia Urbanization Review, 2015

16 The 2007 Population and Housing Census, 2010

17 Growth and Transformation Plan II, 2015

PRIMARY SHOCKS AND STRESSES

The primary shocks and stresses that Addis Ababa faces are listed below. These were identified based on a review of existing studies and reports, frequency and impact on people and assets, group discussions at the launch workshop, interviews, site visits, and discussion among World Bank specialists. For clarification, a *shock* is a single unpredictable event and a *stress* is an ongoing hardship that a community experiences every day.

Shocks

Flooding

Addis Ababa is exposed to both riverine and flash floods due to river overflow caused by extreme rainfall events and upper catchment activities. Climate change projections show that flood risk will increase in the future due to more frequent extreme rainfalls. The vulnerability to flooding is intimately linked with encroaching housing development along river banks, vulnerable housing material such as mud and wood, and poor drainage systems along roadways.

Urban Fire

Most parts of the city are exposed to fires caused by, among others, unsafe cooking practices (use of kerosene and open fires) and unsafe electrical wiring. The fire hazard in the city is exacerbated by the density of neighborhoods (mostly informal settlements or slum areas such as Merkato), poor housing quality, and lack of road access and traffic congestion which prevents mobility of people including emergency responders.

Earthquake

Addis Ababa is only 75-100 km away from the western edge of the Main Ethiopian Rift Valley. Numerous earthquakes of varying magnitude have occurred over the years, some of which have impacted the city. While the likelihood of a substantial earthquake in the future is not known, the impact of an earthquake were it to hit Addis Ababa could be devastating. Lack of enforcement of earthquake standards for housing developments, in combination with low preparedness and capacity, make Addis Ababa highly vulnerable.

Stresses

Addis Ababa faces a multitude of stresses, many of which are directly related to its current level of development. During the launch workshop and in follow-up interviews, a broad set of stresses were identified. The linkages and causalities among them are quite complex. The three listed below were determined to be the most significant in terms of their potential to inhibit the city's ability to reach its goals.

Unprecedented Urban Growth

Addis Ababa is expected to double its population by 2030. This will put a significant strain on the city's ability to deliver on the goal of being a livable and safe city. Urban growth is not a stress in and of itself, and is often positively linked to economic development, but the *unprecedented rapidity* of growth that Addis Ababa is experiencing is putting a stress on the delivery of services and quality of life in the city. Bundled within this stress are several challenges related to housing supply, mobility and traffic congestion, sanitation services, and dependable energy distribution.

Water Scarcity

Addis Ababa is already suffering from water scarcity, which is expected to become even more significant due to rapid urbanization, increased individual water demand as incomes rise, and the impacts of climate change. Production of 450,000 m3 /day is sourced from surface and groundwater, and it is estimated that about 36.5 percent of this water is lost due to leakage and other system inefficiencies. The per capita distribution is estimated to be around 40 liters/day, well below the city's goal of 110 liters/day. AAWSA is currently supplying water to certain parts of the city on a rotating basis, with some areas receiving water only two days a week through distribution lines or water trucks.

Unemployment and Social Vulnerability

There are high levels of poverty, unemployment, and social vulnerability in Addis. It is estimated that 22% of the population is living below the poverty line and 29% of households in Addis report having an unemployed adult (higher than the national urban average of 15%). Moreover, current programs that provide support to poor and vulnerable households are not effectively targeted, have low coverage, are fragmented, and largely focus on categories of vulnerable groups, such as the elderly and disabled (many of which are disabled due to occupational hazard). In addition to the daily stress that this presents for individuals, the cumulative impact among segments of society could reverse gains made on the inclusive growth agenda and result in social unrest.

FINDINGS OF THE CITYSTRENGTH DIAGNOSTIC

During the CityStrength Diagnostic process, sectoral specialists developed a snapshot of the performance of urban systems in Addis Ababa in relation to the qualities of resilience. Better understanding of the strengths and weaknesses within each of the systems served as an input to the overall prioritization process. The following pages provide an overview of the key resilience characteristics for each sector in Addis Ababa.

URBAN PLANNING AND DEVELOPMENT

In a resilient city, physical and socio-economic planning processes are well-coordinated, legally enforced, inclusive, and cross-sectoral. Key stakeholders are involved to align plans with sector priorities and to ensure that the interests of all societal groups are taken into consideration. Coordination between departments and other agencies enables the use of existing knowledge and data across the city to better understand current and future vulnerabilities. Urban planning and development ensures a holistic and long-term approach to urban growth, factoring in potential shocks and stresses and encouraging proactive mitigation measures. Multiple strategies are in place to ensure that primary urban development goals can be achieved in the face of changing demographics, urbanization rates, or economic shifts.

Addis Ababa is urbanizing at an exponential rate, and is expected to transform into a megacity of almost 10 million people by 2037. Recent growth has been sprawling with low density, with the rate of spatial expansion outpacing the rate of population growth. This has implications for the cost of infrastructure and service delivery, traffic congestion, land management, social inclusion, and overall liability. AACG's institutional capacity and resources are also being stretched thin by the pressures of rapid urban growth, and the city is struggling to provide basic services to all of its residents.

At the same time, the city core has extremely high density (from around 15,000-30,000 people per km), concentrating around 30% of the population on 8% of the land in Addis Ababa, generally with poor living conditions. This high density of population, poor quality

of construction materials and inaccessibility of emergency services, contribute to urban fire vulnerability.

The unprecedented rate of growth also puts pressure on the housing sector, especially the lowest income segments. Poor quality housing built in chika (a wood and mud mixture) makes up approximately 70-80% of the total housing stock.[20] This includes informal housing but also the government-owned kebele housing which was built and extended informally before and while under government ownership.[21] There is a high concentration of poor quality housing in peri-urban areas and some city neighborhoods are comprised entirely of poor quality settlements. Informal and kebele housing is often overcrowded, constructed of poor quality materials, and located in relatively higher-risk areas such as along river banks. All these factors make them very vulnerable to shocks such as fire and flooding. While attempts are being made by the city to provide condominium housing, the demand far exceeds the current supply.

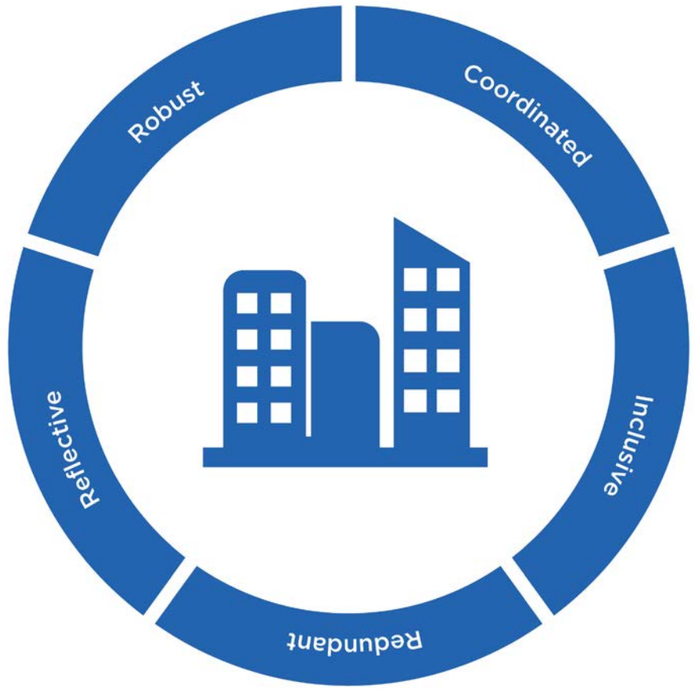
20 The 2007 Population and Housing Census, 2010

21 Stocktaking of the Housing Sector in Sub-Saharan Africa, 2015.

DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Primary Government Counterpart	Time Period
Technical Assistance	Ethiopia Urbanization Review	World Bank	Ministry of Urban Development, Housing, and Construction	2015
Technical Assistance	Addis Ababa Urban and Metropolitan Transport and Land Use Linkages Strategy Review	World Bank	Addis Ababa and Surrounding Oromia Integrated Development Plan Project Office, Ministry of Transport, Addis Ababa City Roads Authority	2013- 2015
Technical Assistance	Integrated Urban Planning to Foster Green Growth	World Bank	Addis Ababa and Surrounding Oromia Integrated Development Plan Project Office, Addis Ababa Transport Program Management Office	2014- 2015
Project	Ethiopia Local Government Development Project II	World Bank	Ministry of Urban Development, Housing and Construction	2013- 2019
Technical Assistance	Ethiopia: Addis Ababa Urban Profile	UN-Habitat	Ministry of Finance & Economic Development	2008

Qualities of Resilience



Coordinated

The implementation of the Integrated Development Plan will require a degree of coordination across bureaus in Addis Ababa that currently does not exist. Each sectoral bureau currently develops and implements its infrastructure investments somewhat in isolation from one another. Moreover, enhanced coordination with sub-city and woreda administrations—who are responsible for municipal services, neighborhood improvement, and building code enforcement—is needed to prepare and implement detailed local development plans.

Inclusive

As part of the revision of the Integrated Development Plan, the project office organized more than 150 meetings and consultations with stakeholders, including informal housing communities. This was important for building trust in the planning process, as well as providing an opportunity to share input and concerns. However, the degree to which stakeholder input influenced the revision is not known.

Reflective

The rapidity of population growth and land consumption, coupled with inconsistent or unavailable data, makes planning and management of growth quite difficult. For example, it was mentioned that the official population growth rate of 3.8% per annum from the CSA underestimated reality; World Bank estimates that population growth will exceed 5% per annum. A variation this large could impact the quality and utility of planning efforts. Another example is the integration of risk data in decision-making. City departments are generally aware of potential flood and landslide hazards, but detailed information and analysis is not available. As such, consideration of these risks in local development plans is limited. Improved and formalized coordination with FEPRA and national agencies developing risk assessments would facilitate the identification of vulnerable areas in the city and enable safer urban growth.

Robust

The regulatory framework to manage urban growth is in place, but regulations are not consistently enforced. For example, the city has formulated building codes covering various facets of risks and land use. However, implementing these codes at city and sub-city level remains difficult; it is feared that most buildings do not adhere to the codes when they receive their building permits. A review of existing policies and guidelines relating to planning standards and building codes is needed to ensure integration of climate adaptation and risk reduction strategies.

DISASTER RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATION

In a resilient city, the disaster risk management system combines a well-functioning and inclusive disaster preparedness and emergency response mechanism with effective disaster prevention infrastructure. Such a mechanism and infrastructure is based on an integrated citywide risk assessment and is developed to prepare for, limit, and recover from expected shocks. In a resilient city, disaster risk management is integrated in all city-planning processes, including construction, land use, socio-economic, and sectoral plans. A resilient city bases its decisions for budget allocation and investment prioritization on information that includes experienced and expected damages and losses from disaster events.

Within Addis Ababa, FEPRA is mandated with implementing DRR and emergency response activities, develop and implement city level DRM frameworks, regulatory standards and plans, collect and analyze all hazards and vulnerability risks, and provide effective early warning information, and rehabilitation services. This is a large mandate for a relatively new institution that grew out of the fire response unit. FEPRA has limited capacity with regard to disaster risk management and limited resources (financial and technological) to carry out its expanding responsibilities. The Addis Ababa EPA formulates and coordinates climate change mitigation related programs, controls river pollution, and conducts environmental impact assessments.

The climate of Addis Ababa is forecasted to have an increase in precipitation variability and temperature. This will likely induce a wide range of hazards in the city including flooding and landslides in addition to droughts and fires which have been the most common hazards in rural and urban areas. The geographic location and topographic features of Addis Ababa, compounded by the existing state of the drainage system, road network and sewerage system, exposes the city to street and riverine flooding as well as landslides. However, the degree of sensitivity to anticipated climate change varies from community to community within the city due to variations in topography, poverty levels, access to basic services, quality of housing and settlement patterns. Landslides are becoming a major threat in some parts of the city due to frequent digging related to the construction boom.

Urban fire has also been identified as an existing shock. With increasing temperatures due to climate as well as to land-use changes in the city, combined with poor housing standards, fire incidents could be further amplified. However, there is little information about the scale of the challenge and the causal factors. One of the issues seems to be the low capacity and lack of coordination of the Fire Prevention unit. This, in combination with lack of appropriate road access and overcrowded traffic, exacerbates the problem.

Addis Ababa is only 75-100 km away from the western edge of the Main Ethiopian Rift Valley, which is a hotbed of tremors and active volcanoes. According to a risk assessment project focusing on seismic activities in urban areas including Addis Ababa, the city could be severely impacted by earthquakes. If an earthquake was to occur at about 27 km away from the city (at similar magnitude of historic earthquake events in the 20th century), it was estimated that 15% of buildings could suffer collapse as well as a high number of fatalities (UNISDR, 1999).

DEVELOPMENT PARTNER ACTIVITIES

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Technical Assistance	Ethiopia Urbanization Review	World Bank		Ministry of Urban Development, Housing and Construction	2015
Technical Assistance	Implementing Support for the Ethiopia Disaster Risk Management Strategic Investment Framework (AAA)	World Bank		Disaster Risk Management and Food Security Sector (DRMFSS)	Forthcoming
Technical Assistance	Urban Emergency Preparedness and Response Capacity Building Program including Risk Assessment	USAID/US Government	Bahirdar University	Fire and Emergency Prevention and Rescue Authority	2013- 2017
Technical Assistance	The Climate Change and Urban Vulnerability in Africa (CLUVA)	European Commission	Addis Ababa University	Ministry of Urban Development, Housing and Construction	2010 - 2013
Technical Assistance	Ethiopia: Addis Ababa Urban Profile	UN-Habitat		Ministry of Finance & Economic Development	2008

Qualities of Resilience

Coordinated

Disaster risk management and climate change adaptation issues are not well coordinated across city departments in Addis Ababa and there is no collaboration or support from the federal level. Ethiopia is recognized as an emerging leader within Africa on systematically advancing climate adaptation and DRM and a new National Policy and Strategy on Disaster Risk Management was adopted in July 2013. The new NPS-DRM introduces a bold paradigm shift from a system that mainly focused on drought response and emergency relief assistance toward a modern DRM system. To operationalize its new DRM policy, the GOE prepared a Disaster Risk Management Strategic Programme and Investment Framework, which provides a basis for the prioritization and planning of investments that will drive Ethiopia's DRM system. However, the new DRM policy, which focuses primarily on rural areas, does not include Addis Ababa. MUDHCo is responsible for urban DRM, but mainly has a focus on secondary cities

Inclusive

Based on the interviews carried out during the CityStrength Diagnostic, there is little evidence to show that communities and other municipal agencies have been consulted on investments in Addis Ababa related to flood control, drainage, and fire prevention. These investment are mostly driven by individual bureaus with limited or no consultation.

Informal settlements along the river banks are particularly vulnerable to seasonal flooding and drainage system overflow. It is estimated that about 5% of the city's residents are vulnerable to flood risk, and two-thirds of them live in simple mud and wood dwellings that are extremely vulnerable to flood damage. In addition to physical damage, these incidents have contributed to health epidemics in the city.

Redundant

Since there is no contingency plan in place and no early warning system to reach communities, most disaster response activities in Addis Ababa are ad hoc. FEPRA is receiving technical support from USAID to strengthen these capacities.

Reflective

Based on a city-wide vulnerability assessment being supported by USAID and the Ethiopian Red Cross, which will consider a wide range of hazards such as flooding, fire, earthquake, and epidemics, FEPRA plans to develop a comprehensive emergency preparedness plan. The draft Integrated Development Plan includes a flood and landslide hazards map, which was developed in collaboration with the EPA and UNDP, but it is not known how the findings of the USAID-sponsored vulnerability assessment will be integrated into the Plan.

FEPRA is currently collecting data on accidents, injuries, and fatalities at the sub-city level. However, there is no standardized, systematic and comprehensive approach on data collection. There is an opportunity to aggregate the data and translate it into a more user-friendly format that would make it accessible to all stakeholders including communities.

Considering the severity of the impact of past earthquakes, as mentioned earlier, and given the significant amount of urban development that has taken place since that time, and the many skyscrapers that have been erected, the impact of a potential future earthquake near Addis Ababa could be devastating. As such, updated research on earthquake risk and potential damages and losses is needed to inform the revision and enforcement of building codes as well as geological survey requirements, as part of the issuance of construction permits

Robust

Disaster risk management capacity in Addis Ababa, including infrastructure, institutional capacity, and financial resources, is very weak. Across all key pillars of DRM—prevention, mitigation, preparedness, response and recovery—the city is at a nascent stage. The lack of early warning systems, emergency response plans, and political attention to these issues, is a significant liability for the government and should be given more importance.

COMMUNITY AND SOCIAL PROTECTION

In a resilient city, residents, including extremely poor and vulnerable groups, are given equal and fair access to basic services. Support structures, such as safety net programs, and complementary livelihoods interventions target all vulnerable segments of the society and effectively deliver their services under any given scenario. All residents have equal opportunity to engage in the formal economy and have sufficient capacity to deal with and bounce back from shocks and stresses. Decision-making and planning is inclusive and reflects community priorities and needs. A resilient city creates opportunities for a thriving civil society that supports the representation of society, including a fair and effective crime prevention and justice systems.

Unemployment and poverty in Addis Ababa are both high, estimated at 23.5% and 22% respectively. More than one in four households report an unemployed adult (28.7%) compared to one in 10 households in other urban areas (10.8%). There is currently no safety net for poor and vulnerable households in general, and for vulnerable categories in particular, such as the elderly and disabled. Efforts are underway with policies such as the GTP II and the Urban Safety Net Strategy to reduce poverty and vulnerability among the urban poor. An Urban Safety Net Project is currently under preparation by MUDHCo in coordination with other agencies, which in addition to alleviating urban poverty will enhance livelihoods with a significant focus on Addis.

Through BOLSA, the Micro and Small Scale Enterprise Bureau, and the Bureau of Women,

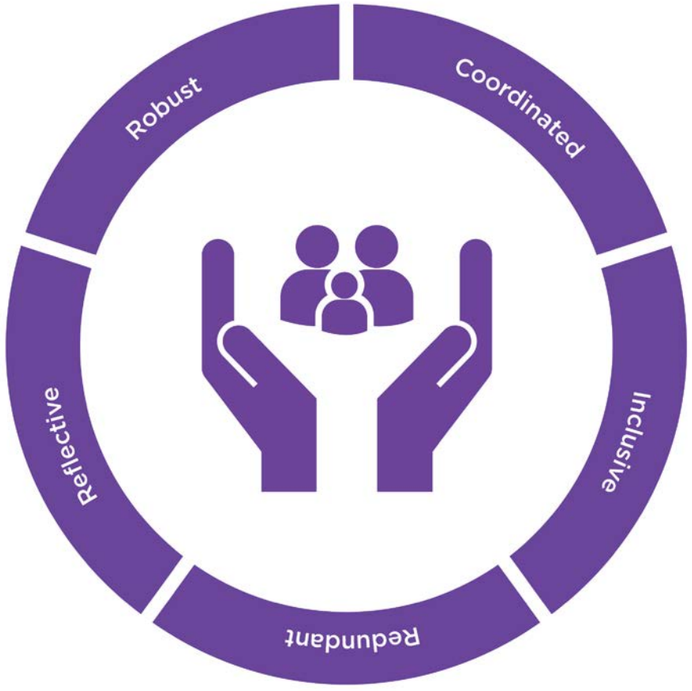
Children and Youth, multiple social programs provide protective and preventive support. However, access to all programs is constrained for several reasons including a requirement for registration and identification to waive fees for certain services, which is an obstacle for individuals who are not legal residents of the city.

Access to basic services varies by location, and some services are priced beyond the reach of the poor. For example, transportation is unaffordable and inaccessible for many. Primary education (until 8th grade) is universal and maternal healthcare is free. However, accessibility may be difficult due to location and poor road infrastructure. Yet, even where services are within proximity of the poor and vulnerable, the latter may be limited by failure to meet costs levied as user fees.

DEVELOPMENT PARTNER ACTIVITIES

Type	Title	Sponsor	Primary Government Counterpart	Time Period
Project	Urban Productive Safety Net Project	World Bank	Ministry of Urban Development, Housing and Construction	Forthcoming
Technical Assistance	Targeting Assessment for the UPSNP	World Bank	Ministry of Urban Development, Housing and Construction	Forthcoming
Technical Assistance	Institutional and Capacity Assessment for the UPSNP	World Bank	Ministry of Urban Development, Housing and Construction	Forthcoming
Technical Assistance	Feasibility Assessment for the UPSNP interventions	World Bank	Ministry of Urban Development, Housing and Construction	Forthcoming
Technical Assistance	Ethiopia Urbanization Review	World Bank	Ministry of Urban Development, Housing and Construction	2015
Technical Assistance	Ethiopia Poverty Assessment 2014	World Bank	Ministry of Finance and Economic Development (MoFED)	2015
Project	Women Entrepreneurship Development Project	World Bank	Ministry of Finance and Economic Development (MoFED)	Approved 2010
Technical Assistance	Ethiopia: Addis Ababa Urban Profile	UN-Habitat	Ministry of Finance and Economic Development (MoFED)	2008

Qualities of Resilience



Coordinated

The primary entities involved in community and social protection issues in Addis Ababa are BOLSA, the Micro and Small Scale Enterprise Bureau, and the Bureau of Women, Children and Youth. Services provided by these agencies are guided by the National Social Protection Policy and funding comes primarily from the Ministry of Finance and Economic Development (MoFED) at the federal level and the Bureau of Finance and Economic Development (BoFED) at the local level. At the federal level, and among donors, there is growing coordination with significant room for improvement on programs and services, but at the local level it is quite fragmented. As part of the proposed Urban Productive Safety Net Project, improvements to interagency coordination are being led by MUDHCo in close collaboration with MoLSA.

Post-disaster response, with a focus on vulnerable groups, is especially weak. FEPRA is in charge of communicating key messages to the communities and they usually do so through the radio and internet. There is a hotline for people to report incidents, but it is purportedly often busy. FEPRA activities in the city are at a nascent stage and they are making attempts to reach out to vulnerable communities through awareness programs.

Inclusive

Addis Ababa has a policy for universal provision of basic services such as water and sanitation, electricity, healthcare, and education, but is struggling to provide equal access to residents, especially the poor who are not formally registered.

Women have been playing an increasingly important role in the economy and politics. For example, Enat Bank was established in 2012 with a special focus on reaching women. At the national level, there is female leadership in the highest ranks of government. At the family level, the legal system has been supporting women's rights as well. For example, in 2005, a law was passed that provides for the division of assets in cases of divorce. In informal circles, it is usually women who lead initiatives and who volunteer. However, this does not always hold true in formal circles. Moreover, because the majority of urban women lack attributes that are required by the formal economy (i.e. education, skills, experience), they benefit less from the growth of the formal economy compared to their male counterparts. For example, while the construction sector is booming, women benefit less as they assume the labor intensive roles while men often take management positions.

The government conducts public information sessions as part of planning processes, including meetings and public forums. However, it is unclear how consultative the process really is. Participation in local development decision-making is usually considered a formality. Overall, it appears that Addis Ababa needs to strengthen citizen engagement efforts. The city needs to leverage informal initiatives and strengthen formal ones in order to have more efficient engagements. This includes capacity building for city officials and community members alike as well as stronger coordination efforts since there are many fragmented initiatives. Additionally, the government should ensure that there is accountability and transparency. The latter is part of existing objectives but it is particularly problematic when there are political interests involved. Addis Ababa will thus need to consider establishing a citizen engagement platform in a more systematic manner to allow citizens to participate in the elaboration of policies and programs that are aimed at providing services and opportunities for them as well as play a role in monitoring their implementation.

Redundant

The *iddir* was highlighted as a useful informal support system that could be considered as a back-up social protection mechanism. It is not limited to the grieving process or payment for funerals but rather its mandate goes beyond to include other social crisis (i.e. sickness) for which a household may need additional support. The *eiquib* is another form of informal social protection. While group members initially bond over savings and loans, the group develops strong social ties related to information sharing and mutual support. In addition, if one member experiences a sudden problem or hardship, they will be prioritized for the next loan. Both *iddir* and *eiquib* (and others as well, some of which are formed on the basis of ethnicity and religion) are very active. They are all over the city and some of them are very well-established. The government is trying to leverage these associations and broaden their scope to include other areas that would benefit from community involvement. A good example has been a strong desire by local officials and the citizenry to use iddir as an important platform for promoting community based targeting for the Urban Productive Safety Net Project, an option that is currently being assessed.

Qualities of Resilience

CONTINUED

Reflective

Poverty data, while updated every two years by the Central Statistical Agency, may not adequately reflect the conditions and presence of informal settlements across the city. As Addis Ababa rapidly develops and transitions, AACG recognizes that it is important to ensure that neighborhoods contain a mix of socio-economic groups. For example, when it was recognized that some areas of the city were developing in a way which appeared to isolate higher-income groups, housing for lower income groups (i.e. condominiums) were planned for development in those areas to ensure a level of integration and cohesion among various groups. AACG appears to be taking lessons learned from other countries in attempts to avoid “ghettoization” in the city. An extensive study of the most vulnerable groups should be carried out to help inform urban development decision as well as to ensure that social service programs are well targeted and efficient.

Robust

BOLSA targets several vulnerable groups, including: (i) the elderly; (ii) the disabled; (iii) street people/ beggars; (iv) the poor; and (v) commercial sex workers. There is a special focus on the disabled and the elderly, recognized as the most vulnerable groups. It was also noted that BOLSA targets homeless children, but they are not their own category. Clearly, there are efforts to better serve the vulnerable but there is need to make the current strategy effective. Additionally, it is unclear how the current registration and identification system is affecting the provision of social services. With a growing population, the city is challenged to provide adequate services to meet the demand of the residents.

The disabled are a big target group in terms of social and community protection. Most of the disabled are people who experienced an accident in the workplace (construction sites, factories, etc.) therefore, stricter safety regulations in workplaces would benefit the city by reducing the number of accidents resulting in disabilities. This is a serious problem because of the vast number of people working in jobs with high accident rates, especially construction. This was noted during site visits and consultative group discussions.

According to a recent public expenditure review, Ethiopia spends approximately 3 percent of GDP on social protection programs. This includes general subsidies, safety nets, social insurance, and labor market interventions. At the national level, social safety nets and subsidies are the largest social protection programs. Safety nets are primarily financed by donors but the government would like to eventually be the main contributor to social programs. Safety nets and subsidies do not currently target Addis Ababa, therefore, the Urban Productive Safety Net Program will be essential to support the GoE in providing access to effective safety nets and livelihood services to the poor in selected urban areas, including Addis Ababa.

ENERGY

In a resilient city, the energy system offers a secure supply of power that ensures the continuity of services in the event of disruptions. It has spare capacity to provide power to the city under any circumstances, especially to ensure continuity to the functioning of critical infrastructure like hospitals and government buildings. The planning for and design of energy infrastructure is informed by an integrated risk assessment taking major shocks and stresses into consideration. A resilient energy system provides access to electricity to all societal groups, and embraces both centralized and decentralized approaches as appropriate. Management of the energy system, including decisions regarding distribution and pricing, is inclusive of local departments and stakeholders.

At the federal level, the Ethiopian Electricity Agency (EEA) regulates all companies involved in the electricity sector , while the Ministry of Water, Irrigation and Energy is responsible for the development of the country's water and energy sectors including the power sector. The former Ethiopian Electric Power Corporation (EEPCo), a vertically integrated utility in charge of the power sector, was divided into two utilities in December 2013. Ethiopian Electric Power (EEP) is now in charge of Generation and Transmission while Ethiopian Electric Utility (EEU) is responsible for Distribution and Sales. The main energy source of interconnected systems is hydropower plants, and for the self-contained systems is mini-hydro and diesel power generators located in various areas of the country. At the city level, EEU and EEP are mainly responsible for the maintenance of sub-stations and transmission systems. AACG's sphere of influence with regard to electricity is predominately limited to

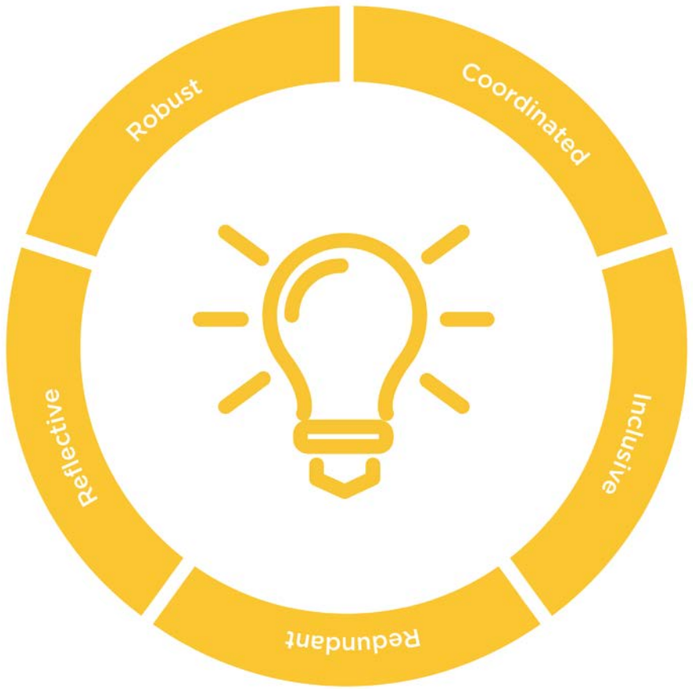
street lighting, municipal buildings, and solid waste.

The ageing electricity network (some segments of the network are over 30-40 years old) is overloaded and is not able to provide efficient and reliable service to customers. The transmission and distribution lines and the sub-stations are in urgent need of repair and expansion just to keep up with the current load which is essential for anticipated future demand. With 614 MW demand in 2014, Addis Ababa accounted for around 42% of the country's interconnected system peak load. The upgrades are also necessary to improve efficiency and reduce the system losses that the overall country power system experiences, currently estimated between 20% and 22.7% for Addis Ababa.

DEVELOPMENT PARTNER ACTIVITIES

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Technical Assistance	Ethiopia Urbanization Review	World Bank		Ministry of Urban Development, Housing and Construction	2015
Technical Assistance	Ethiopia Energy Sector Review and Strategy	World Bank		Ministry of Water and Energy	Forthcoming
Strategy Document	Development of Energy Efficiency in Three Pilot Cities in Sub-Saharan Africa—Addis Ababa	World Bank	Camco—Clean Energy, Verco	Addis Ababa City Council	2014
Infrastructure Project	Ethiopia Electricity Network Reinforcement and Expansion Project (EENRP)	World Bank		Ministry of Water and Energy, Ethiopian Electric Power (EEP), Development Bank of Ethiopia	Approved 2012
Technical Assistance	Ethiopia: Addis Ababa Urban Profile	UN-Habitat		Ministry of Finance and Economic Development	2008

Qualities of Resilience



Coordinated

Ethiopian Electric Power (EEP) is preparing the Addis Ababa Distribution System Master Plan Study (AADMP), which will identify the refurbishment, upgrade and expansion of the distribution network required to meet the rapidly growing demand presented in the Integrated Development Plan while also ensuring acceptable quality and reliability of supply. AACG has collaborated with EEP and the Ethiopia Electric Utility (EEU) in the design of the AADMP. A stronger effort should be made to incorporate the distribution master plan into the Integrated Development Plan in order to ensure coordination efforts.

Inclusive

Urban areas in Ethiopia have largely reached a universal electricity access rate. In Addis Ababa, according to the EEU data, 0.97 million households are connected to the grid. The estimated access rate in Addis is 98%, but outages and interruptions are very frequent. Based on data from January 2015, there were 42 interruptions per week on average due to medium voltage conductors breaking or interrupted lines due to substation breakers being opened. Informal connections are common, particularly in informal settlements. There is a backlog of people who have submitted a request for connection; delays are primarily due to technical issues and network capacity. The major bottlenecks for electricity access expansion is the difficulty to mobilize financing in a context of a non-financially viable power sector (i.e. the tariff is not cost reflective). Furthermore, operation and maintenance is negatively impacted by general macroeconomic problems related to the fluctuation of foreign exchange and scarcity of foreign currency that create risk in equipment supply delivery due to delay in the import of spare parts or input material for the local manufacturers.

Redundant

In the event of an emergency, there is no specific plan of collaboration in place between the utility and AACG. In the city, there is a Distribution Control Centre (DCC) that manages the Medium Voltage system as well as a separate Emergency Maintenance Section. Although the DCC has a computer-based system at its disposal, it is not fully operational. The system is not dual redundant, but is subject to an off-line backup every week. Addis Ababa does not have any specific contingency plan or funding in place to cope with severe disruption of the system or unpredicted events that may cause dysfunction of the system or damages to the equipment. The system is successfully designed to carry out fault repairs or routine work without isolating the entire cycle, as there are several loops and redundancies that permit isolation of the faulty section with minimal impact to customers. However, restructuring on the network is a continuous process to cope with the rapid demand growth and the AADMP is expected to define needed investments.

Energy portfolio diversification plays a critical role in reducing vulnerability, not only to supply disruptions and oil price hikes, but also to climate change. Ethiopia is highly vulnerable to extreme weather variability, particularly erratic rainfall (hydrologic forecast included in the National Power Transmission master plan). With climate change, it will likely increase the frequency of both flooding and droughts, posing a significant challenge to hydropower generation. While hydropower generation accounts for almost 95% of the total current energy generated, Ethiopia has committed to diversify its generation sources by scaling wind and solar power energy as mitigation measures against power shortages, especially during the dry season, while investments in geothermal (1000MW under negotiation with a private developer) and biofuels complement the intermittent resources. As of 2015, wind plants (324 MW) account for 13.4% of the installed generation capacity of the country. There is a waste to energy plant under construction that will generate 50MW (other 2 plants of 50MW each are planned to be built in the city). All in all, a steady development of the huge potential of solar, wind, sugar and biomass can help to achieve easily the diversification objective.

Qualities of Resilience

CONTINUED

Robust

The projected rapid growth in population, urbanization, and GDP growth create a progressive stress and conspicuous increase in demand. In particular, the AADMP forecasts an increase in electricity demand in the city (covering the current 10 sub-cities) from 614 MW in 2015 to 1747 in 2034.[22] This will stress the current system and require a reinforcement of transmission corridors from the Western and North Western regions to Addis and the upgrading and expansion of substations. Loss reduction measures should be considered during the planning phase. The cost of the recommended short term rehabilitation and expansion of the distribution network is estimated at $285 million between 2015 and 2017.

To avoid major disruption to the system at the household level as well as prevent urban fire, AACG should ensure that the residential electric wiring systems meet minimum safety standards. A certification mechanism should be designed and enforced. Periodic household inspections are needed to make sure that there are no risky situations created by unsecure modifications of the system. Wooden distribution poles in the network are planned to be progressively replaced by concrete to address the fire risk. An awareness campaign could be promoted to inform households about avoiding electric hazards and how illegal connections can provoke major accidents.

22 The AADMP include in its analysis twelve surrounding Oromia woredas supplied by the Addis Ababa network. Aggregate demand forecast will then grow from 759 MW to 2978 MW.

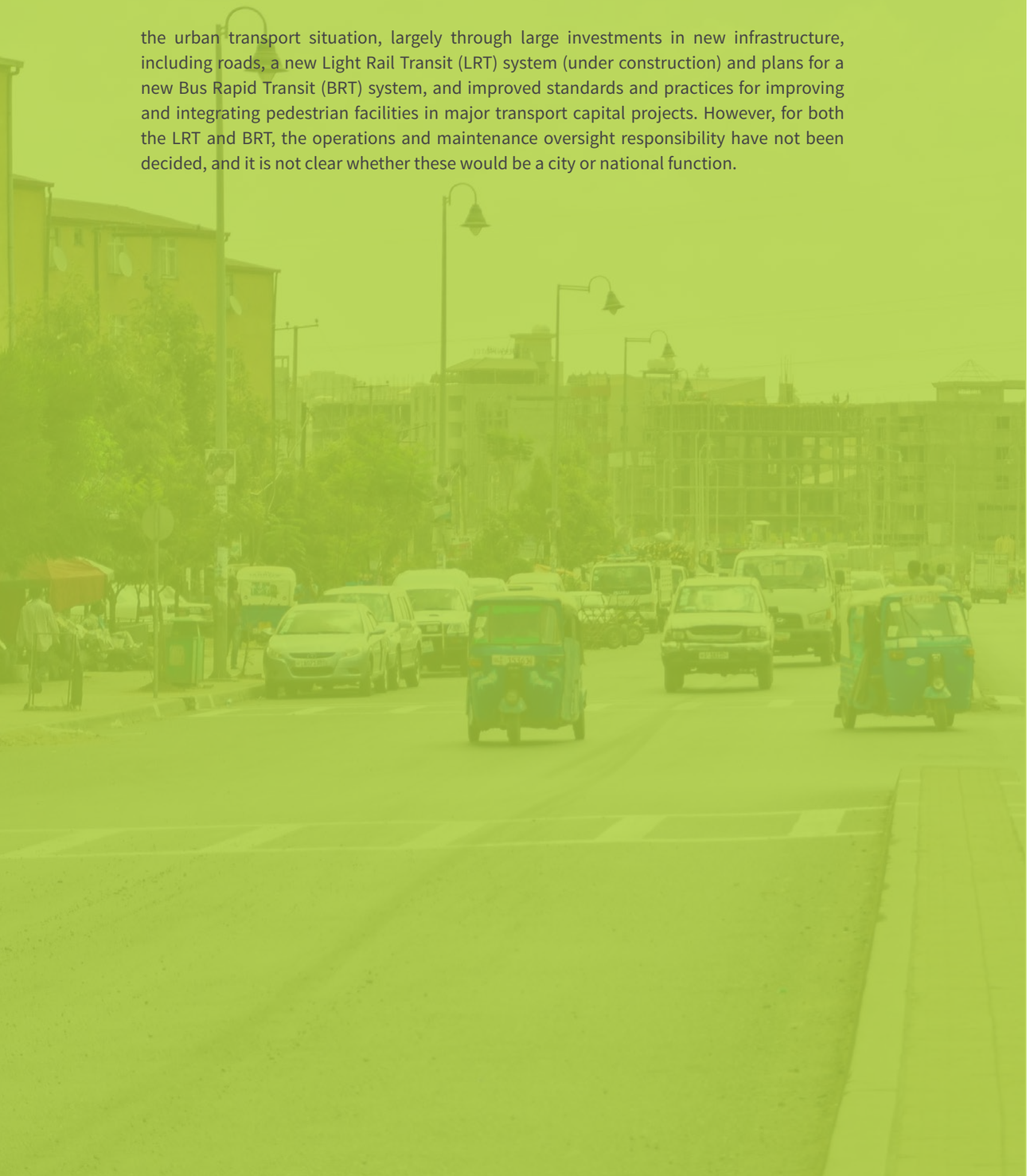
TRANSPORTATION

In a resilient city, the transport system offers multiple modes of transport to its users to ensure the continuity of mobility in the event of disruptions, and to ensure access to transportation for all population groups. It takes a flexible approach and proactive coordination with other agencies to be able to divert user traffic to different modes of transport based on changing conditions. In a resilient city, the planning for and investments in the transport sector are based on an assessment of past shocks and stresses and are closely aligned with other departmental plans and overall key priorities of the city.

The expansion of Addis Ababa along the five radial roads has posed many challenges for the city, especially in terms of increased transportation costs, congestion, and delivery of public infrastructure services. Additionally, there is a lack of coordination between transport investments and urban development. Indeed, housing and land-use decisions are taken on the basis of where available land resources are, with almost no assessment of transport impacts, thereby missing the opportunity to integrate public transport modes in terms of coverage, routes, fares, schedules and facilities. Low coverage of streets and a lack of street grid network and associated infrastructure has resulted in further inefficiency of mobility and associated issues of productivity, quality of life, and social inclusion.

Over the past few years, Addis Ababa has been making a concerted effort to improve

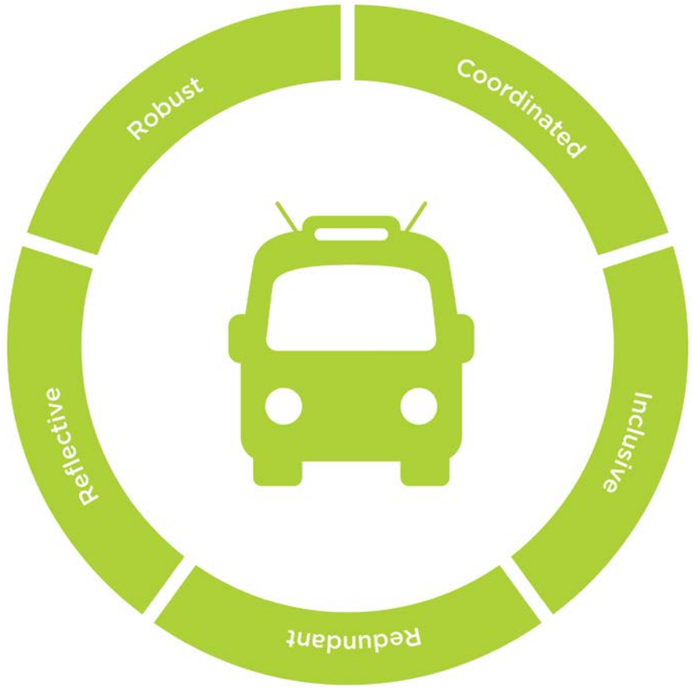
the urban transport situation, largely through large investments in new infrastructure, including roads, a new Light Rail Transit (LRT) system (under construction) and plans for a new Bus Rapid Transit (BRT) system, and improved standards and practices for improving and integrating pedestrian facilities in major transport capital projects. However, for both the LRT and BRT, the operations and maintenance oversight responsibility have not been decided, and it is not clear whether these would be a city or national function.



DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Primary Government Counterpart	Time Period
Technical Assistance	Ethiopia Urbanization Review	World Bank	Ministry of Urban Development, Housing and Construction	2015
Project	Ethiopia - Addis Ababa Urban Land Use and Transport Support Project	World Bank	Addis Ababa Road and Transport Bureau	Forthcoming
Technical Assistance	Integrated Urban Planning to Foster Green Growth	World Bank	Addis Ababa and Surrounding Oromia Integrated Development Plan Project Office, Addis Ababa Transport Program Management Office	2014 - 2015
Infrastructure Project	Road Sector Support Project	World Bank	Ministry of Finance and Economic Development	Approved 2013
Technical Assistance	Addis Ababa Urban and Metropolitan Transport and Land Use Linkages Strategy Review	World Bank	Addis Ababa and Surrounding Oromia Integrated Development Plan Project Office, Ministry of Transport, Addis Ababa City Roads Authority	2013 - 2015
Technical Assistance	Review of Road Construction Costs in Ethiopia	World Bank	Ministry of Finance and Economic Development	2012 - 2015
Project	Ethiopia-Transport Sector Project in Support of RSDP4	World Bank	Ministry of Finance and Economic Development	Approved 2012
Project	Ethiopia-Road Sector Development Program APL4	World Bank	Ministry of Finance and Economic Development	Approved 2008

Qualities of Resilience



Coordinated

The organization of transport infrastructure management rests with the Addis Ababa Road and Transport Bureau. A reorganization of this Bureau was approved by the City Council in 2014 and is currently in process. When completed, management of road infrastructure will rest with the Addis Ababa City Roads Authority. A Traffic Management Agency, reporting to the Bureau will be responsible for traffic management in the city. Management and coordination of the public transport network will rest with a Public and Freight Transport Authority–with the exception of the light rail service, which will be managed by the Ethiopian Railway Corporation, a Federal entity. The airport is managed by the Ethiopian Airports Enterprise, though emergency services at the airport are under the jurisdiction of the Ethiopian Civil Aviation Authority. Given the number of entities involved in the transport sector, coordination will continue to be a challenge. Across sectors in the city, recent efforts have supported closer alignment between transport and land-use planning.

Inclusive

Currently, Addis Ababa has no mass transit system. However, the city is served by mini-bus taxis and Anbessa bus services. These services cover the city fairly well and equitably. The city is developing three new mass transport lines – one BRT and two LRT lines. These lines will have limited geographic coverage. The Public Service Employees Transport Service Enterprise provides free transport to civil servants and runs before and after office hours.

Redundant

The transport system does not currently meet demand without substantial delays and variability of travel time. Most of this is associated with artificial capacity constraints created by poor management and enforcement practices, rather than physical capacity constraints. More quantitative assessment is required to determine when traffic growth will overtake current capacity.

The transport mode is predominantly vehicular transport although there are three new mass transport lines being planned – one BRT and two LRT lines, which will offer alternative modes. However, these lines will have limited geographic coverage. While public transport is available, it is often unaffordable by the poorer section of the population. No alternative commute strategies are in place at present in the event of an emergency, and if one mode has been impaired, the system does not have the flexibility for the demand to be absorbed by other modes.

For freight, a key access point to the city is from the south, Modjo, which is also the main arterial toward Djibouti. Capacity has been expanded recently with the creation of the Addis-Adama expressway, which terminates on the outskirts of the city, putting major stress on the existing radial route. An outer ring road and rail line are under construction, which should relieve the existing route.

Reflective

Addis Ababa is in the process of establishing new institutions to manage traffic and public transport. The city anticipates that these institutions will undertake regular data gathering and monitoring of performance. However, this is not generally practiced now. Risk data and anticipated climate change impacts are generally not incorporated in transport planning decisions.

Robust

The road network is vulnerable to gridlock, particularly at peak hours. There are some key points of high traffic congestion, but much of the network is susceptible to delays caused by lack of traffic management, breakdowns, or accidents. Even minor accidents can cause substantial disruption to traffic flows, delaying the arrival of emergency services. Currently, transport development plans and regulations do not include such risk analysis.

There is a strong dependency between roads and urban drainage, as existing and new roads interrupt natural drainage patterns. Run-off has been increasing due to the increased area of hard landscape. Flooding causes significant but short-lived disruption to the road network, as a result, congestion and delays tend to increase during the rainy season.

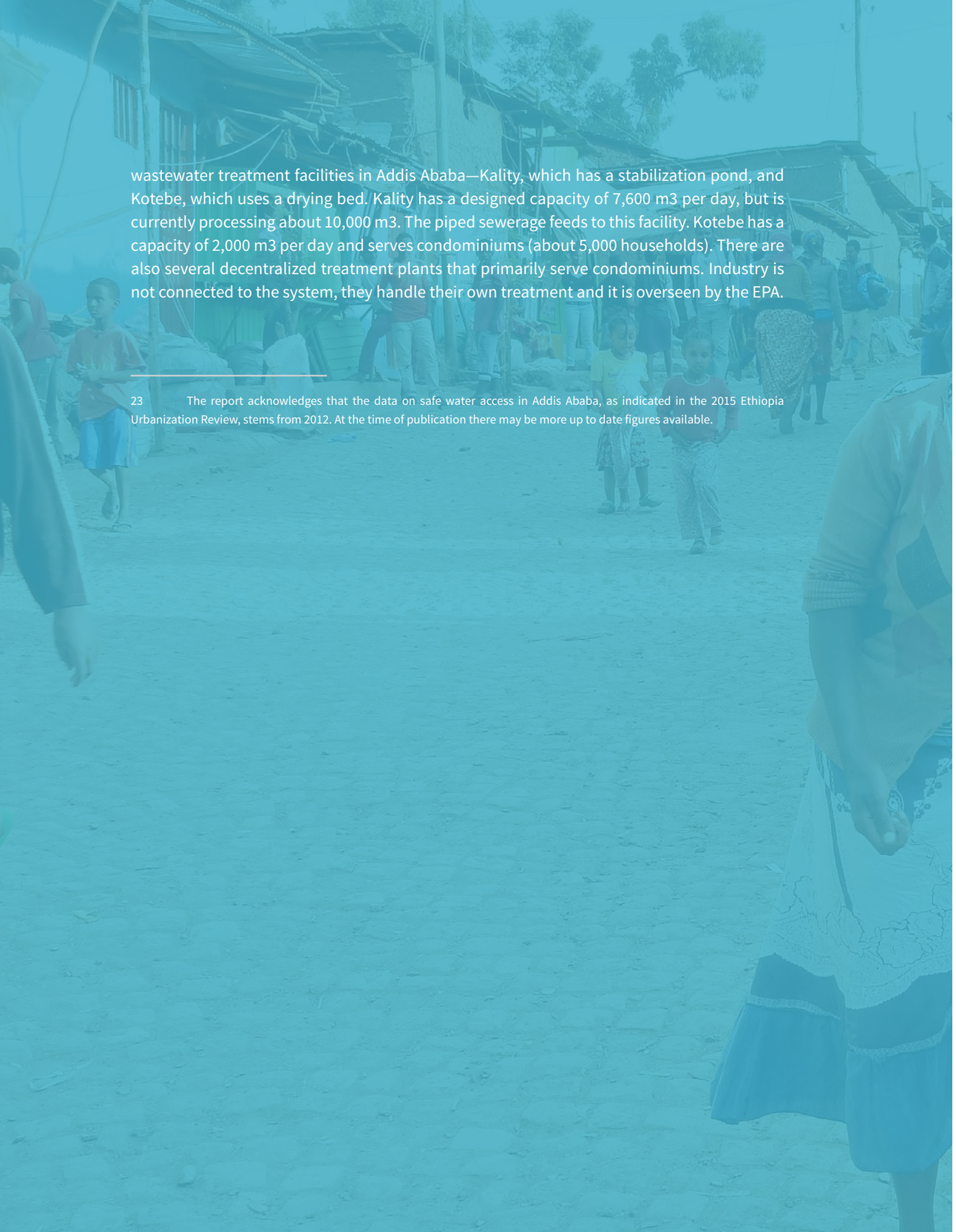
At present, road transportation infrastructure is funded from the city's own budget. Generally, the city does not include resources for road maintenance; it is sourced from the national Road Fund, whose allocation to Addis Ababa is generally inadequate for comprehensive maintenance. It is recommended that the city supplements maintenance resources from the Road Fund with its own resources.

WATER AND SANITATION

In a resilient city, potable water and sanitation services are accessible to all segments of the population. Water and sanitation infrastructure is planned with a holistic approach taking into account social, economic, and environmental risks and vulnerabilities. Planning for and investment in the sanitation and water systems is driven by demand and supply data, participatory engagement, and is based on cross-departmental collaborations that support coordination with existing urban development plans and priorities. In a resilient city, there is sufficient human and technical capacity to ensure sustainable operation, maintenance and financial management of water and sanitation infrastructure and services.

Addis Ababa has not yet reached full coverage of water supply or sewerage, and also faces significant and growing water scarcity. It is estimated that only 44% of the population has access to clean water [23] and 30% has access to piped sewerage or vacuum truck service.

Addis has two sources of water – surface and groundwater. Surface water comes from 3 dams that feed into 2 treatment plants. They are in the east and northwest of the city and flow to the city with gravity. There are 3 primary well fields for groundwater extraction with a total of about 50-60 wells. They are in the southeast section of the city. Water is collected into tankers via gravity and treated, and then pumped to the city. The pumping stations are powered by the electric grid and each one has a back-up generator. The groundwater is from a volcanic aquifer, making recharge from retention ponds infeasible. There are two



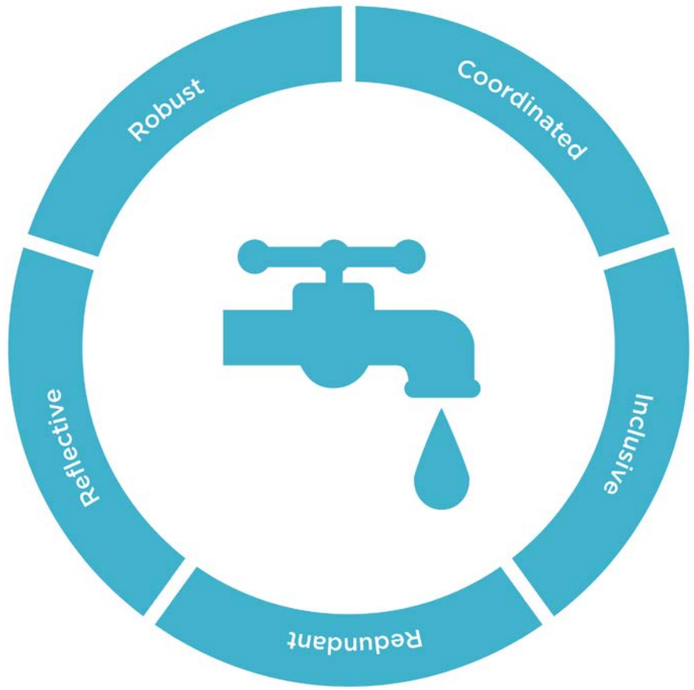
wastewater treatment facilities in Addis Ababa—Kality, which has a stabilization pond, and Kotebe, which uses a drying bed. Kality has a designed capacity of 7,600 m3 per day, but is currently processing about 10,000 m3. The piped sewerage feeds to this facility. Kotebe has a capacity of 2,000 m3 per day and serves condominiums (about 5,000 households). There are also several decentralized treatment plants that primarily serve condominiums. Industry is not connected to the system, they handle their own treatment and it is overseen by the EPA.

23 The report acknowledges that the data on safe water access in Addis Ababa, as indicated in the 2015 Ethiopia Urbanization Review, stems from 2012. At the time of publication there may be more up to date figures available.

DEVELOPMENT PARTNER ACTIVITIES:

Type	Title	Sponsor	Partners	Primary Government Counterpart	Time Period
Technical Assistance	Ethiopia Urbanization Review	World Bank		Ministry of Urban Development, Housing and Construction	2015
Technical Assistance	Sustainable development and management of ground water resources	World Bank		Ministry of Water and Energy (MoWE)	2013
Strategy Document	Asset Inventory and Management Plan for the Addis Ababa City Government	World Bank		Addis Ababa City Government Ministry of Urban Development, housing, and Construction	2012
Technical Assistance	Ethiopia: Addis Ababa Urban Profile	UN-Habitat		Ministry of Finance & Economic Development	2008
Infrastructure Project	Urban Water Supply and Sanitation Project	World Bank	AFD	Addis Ababa Water and Sewerage Authority Ministry of Water, Energy and Irrigation	Approved 2007

Qualities of Resilience



Coordinated

The Addis Ababa Water and Sewerage Authority (AAWSA) has the mandate to develop, collect, treat, and distribute water and wastewater. The Ministry of Water, Irrigation, and Energy has the mandate to set policies and regulations for water supply. Governance of urban sanitation issues, however, is less clear cut. A technical working group established by the Ministry of Health is advising the government to create an integrated urban sanitation strategy. It reflects the need for closer coordination between AAWSA, EPA, and the Department of Health to ensure the safety of the population and the ecosystem.

Inclusive

It is estimated that only 44% of the population has access to clean water. The target is to provide about 110 liters per person per day, while current supply stands at only 40 liters. AAWSA is currently supplying water to certain parts of the city on a shift basis. There are a number of pocket areas that receive water two or three days a week through the piped system (data as of November 2014). The disruption seems severe at Gulele, Kolfe Keranio, Addis Ketema, and Arada. Others such as Kaliti Akaki, and Lafto Nifas Silk also get water in shifts. Liquid waste is collected by vacuum trucks and piped sewer lines. The combined coverage of these systems is around 25-30% of the city. There is a clear and urgent need to expand sanitation services across the city, especially to those living in the informal housing.

Redundant

Demand for water and sanitation service far exceeds supply. As such, there is no excess capacity or back-up supply for water or sewerage in the city that would provide redundancy in the system. Water supply is derived from two sources: 40% surface and 60% groundwater, which are already under stress and failure of either source would result in a crisis. Disruptions to water supply are generally handled by providing water by tanker truck. AAWSA has a fleet of 30-40 tanker trucks that can each serve about 130 households per day. In regard to wastewater treatment, there is no back-up plan in place other than direct disposal to water bodies. There is no contingency financing earmarked for water and sanitation, and minor maintenance and repair is covered by the AAWSA's budget.

Reflective

AAWASA has comprehensive information on the location of primary water and sewerage infrastructure, but limited data on its current state of repair or the ability of the system to remain operable in the event of a disaster. There is no proactive maintenance procedure in place, and most improvements occur only when a line breakage is reported.

According to the interviews carried out as part of the CityStrength Diagnostic, all water and sanitation infrastructure is built to meet the seismic risk factor determined by the Ministry of Urban Development, Housing, and Construction. Moreover, some of the older reservoirs (about 15 years old) were designed with technical advice from the Japanese and include seismic design specifications. Other potential shocks and stresses such as flooding or water scarcity are not integrated into the planning and design of new infrastructure.

Robust

The water and sewerage system in Addis Ababa does not serve all areas of the city or segments of society, and is generally maintained on an ad hoc basis. The estimated water leakage rate of 36.5% is high, especially considering that water scarcity is already a challenge for the city and is expected to worsen due to climate change and increased demand.

The construction, operation, and maintenance of water and sewerage infrastructure is financed by the city administration. Users pay in advance for vacuum trucks. In regard to piped sewerage, users pay for the connection to their residence (about US$150 on average), but do not pay any service fee. Collection of water fees is estimated at 60-80%. Expenses related to minor disruptions or maintenance are covered by AAWSA.

PRIORITY ACTIONS AND INVESTMENTS

The primary shocks that Addis Ababa faces are floods, urban fire and earthquake. At the same time, the city faces a multitude of stresses, many of which are directly related to its current level of development, including unprecedented urban growth, water scarcity, and unemployment and social vulnerability.

The unprecedented urban growth that Addis will face over the coming decades could create the agglomeration of people and economies that can catapult the city towards its long-term goals, but if not well managed, it could also exacerbate existing shocks and stresses related to natural hazards, access to basic services, congestion, economic opportunity, and individual well-being. Enhancing resilience in Addis requires actions and investments that are oriented toward implementing existing plans and regulations, establishing clear and capacitated leadership on risk management topics, improving safety nets for residents and investing in infrastructure that meets existing and future needs.

Priority Actions

Address unprecedented urban growth by quickly focusing on the implementation of the Integrated Development Plan. The draft Plan is quite comprehensive and technically sound. The challenge is its effective implementation and prioritization of interventions for the short, medium and long term. Specific recommendations include:

Create an implementation 'business plan': The implementation of the plan will be facilitated by the preparation of a business plan that identifies priorities and articulates the phasing of works, costs and financing sources, and roles and responsibilities. The city should develop a strong communication plan and consider promoting participation of civil society, transparency, and accountability by creating a website for public information dissemination, monitoring, and updates on the Plan's progress.

Promote coordination at multiple levels: As an "integrated" master plan, its success will depend on the coordination, collaboration, and enforcement of multiple agencies in the city. The preparation of the Integrated Development Plan has benefited from the establishment of a high-level, multi-agency committee. During implementation, this entity should be maintained and institutionally strengthened. In addition, working level technical teams from across agencies should be formed to support and enforce implementation in specific areas of the city (i.e., a high density transit node, a suburban neighborhood, etc.) This could be done on a pilot basis to test its effectiveness.

Provide support for the development of the Local Development Plans: High-quality and technically sound LDPs need to be developed in line with priorities set by the business plan and as soon as possible to inform public works and private construction. Sub-cities will require support for this process to ensure that the LDPs include community consultation and participation, integrate risk data, and adhere to the guidelines of the Integrated Development Plan.

Ensure a balanced focus between the city center and peripheral areas: Redevelopment and upgrading of the city core is an important component of the vision laid out in the new Master Plan, which recognizes that Addis Ababa has vacant and underused land in prime locations that could be leveraged for denser development in existing urban areas, through a balanced mix of functions and mobilizing cultural heritage assets to improve identity, livability and attractiveness to tourism related economic activities. At the same time, however, it should be recognized that it will not be possible to meet the pace of expected urban growth solely through measures aimed at redevelopment of existing core areas.

Efforts need to be taken now to ensure that fringe growth is orderly and that viable and affordable transportation options exist. Transportation and other trunk service infrastructure can be used to guide urban fringe growth. The provision of formal and informal employment opportunities for this peripheral population needs to be considered. Consultations with stakeholders including communities, needs to be taken into consideration in the planning and implementation of LDPs.

Focus on the review and enforcement of building codes and safety regulations as a means of addressing multiple shocks and stresses and working toward the goal of creating a safe and livable city. As construction in Addis increases in pace and scale, the enforcement of existing building codes and safety regulations will be paramount. The construction practices do not adhere to basic standards and have low safety practices, resulting in many accidents at construction workplaces (construction sites, factories, etc.). Additionally, review and enforcement of building codes (including, for example, enforcing periodic inspection of sensitive electric installations) could have a substantial impact on reducing fire, earthquake, and flood risks.

Establish a disaster risk management and climate change adaptation coordination unit under the Mayor to strengthen, promote, and mainstream risk management initiatives across municipal agencies. At the national level, Ethiopia is recognized as an emerging leader within Africa on systematically advancing climate

change measures and DRM, and a new National Policy and Strategy on Disaster Risk Management (NPS-DRM) was adopted in July 2013. In Addis, the responsibility for implementing the NPS-DRM currently lies with FEPRA. However, FEPRA has limited capacity with regard to comprehensive disaster risk management, and limited number of relevant staff as well as limited resources (financial and technological) to carry out its expanding responsibilities. In addition, there is little to no coordination among city agencies and bureaus, including the master plan project office and EPA, as well as no collaboration or support from the federal level such as the Disaster Risk Management and Food Security Sector (DRMFSS). The new unit needs to have defined roles and responsibilities which should include as part of its work program the preparation of a DRM & CCA strategy that would focus on risk management and preparedness for major incidents, a river management plan to address macro-drainage problems, establishment of risk financing mechanisms (including contingency planning), data collection on losses and damages with regard to multiple hazards (to reflect actual costs), and commissioning of studies and analysis of specific risks such as earthquake. With support, FEPRA could play a prominent role in the new unit, providing technical advice and guidance on planning and strategy development.

Address localized flooding due to surface water run-off by developing a stormwater drainage master plan and supporting AACRA in assuming its imminent mandate to manage drainage in the city. There is a strong dependency between urban development, roads and drainage, as existing and new roads interrupt natural drainage patterns. Moreover, stormwater drainage infrastructure is often installed under or adjacent to the road network. Run-off has been increasing due to the expanding areas of hard landscape, resulting in more frequent, but short-lived, flash floods, leading to widespread disruption to the road network. The expected increase in run-off will have implications for flooding in the city and could worsen the present loss of lives and properties. Those living on land prone to flooding during heavy rainfall events (e.g. riverbanks, low lying areas, etc.) will be at greater risk should these rainfall events become more commonplace. An approach to urban drainage needs to be taken at a city-wide scale, and a new urban drainage master plan should be coordinated with the Integrated Development Plan, based on hydraulic modeling that includes anticipated impacts due to climate change. Moreover, the effective operation of the drainage system will require improvements in solid waste management to ensure that drains are not clogged by waste. As this is a new mandate, AACRA will require technical support.

Develop and strengthen core city agencies involved in transport to manage traffic congestion and accidents as well as roadway flooding. Transport in the city is managed by the Addis Ababa Road and Transport Bureau, with responsibility for specific aspects of the transport system allocated to the Addis Ababa City Roads Authority (AACRA), the Traffic Management Agency (TMA), the Public and Freight Transport Authority (PFTA), and the Ethiopian Railway Corporation. Strengthening the capacity of these agencies to fulfill their mandates and their coordination would make a significant impact on traffic congestion, accidents, and roadway flooding. The transport system does not currently meet demand without substantial delays and variability of travel time, but most of this is associated with artificial capacity constraints created by poor management and enforcement practices, rather than physical capacity constraints. Indeed, more quantitative assessment is required to determine when traffic growth will overtake current physical capacity. Currently, even minor accidents can cause substantial disruption to traffic flows, and delay the arrival of emergency services. There are some critical locations with high traffic congestion, but much of the network is susceptible to delays caused by lack of traffic management, breakdowns or accidents. During the rainy season, congestion and delays are exacerbated.

Perform an extensive study of the most vulnerable groups with special attention to existing social service programs and access to housing. Currently, the most vulnerable groups in Addis cannot benefit from many of the social services available because they are inaccessible or unaffordable. Current local social protection programs administered by the Bureau of Labor and Social Affairs (BOLSA) target 5 categories: the elderly; the disabled; street people/ beggars; the poor; and commercial sex workers. There is evidence that addressing social protection in this way is ineffective because some people fall into multiple groups. Analysis is needed to better understand vulnerable segments of the population in Addis as well as how the current registration and identification system is affecting delivery of social programs. In addition, an inclusive housing strategy, including a review of household affordability and the on- and off-budget subsidies associated with the condominium program, should be developed specifically for Addis given its unique context within the country.

Strengthen citizen engagement efforts using disaster risk management and climate change adaptation as a point of entry. A functioning neighborhood-level early warning system should be established for residential areas along rivers and in densely populated zones. There are limited awareness-raising activities and no early warning system in place – communities are highly vulnerable. FEPRA is aware of this weakness, but there are no plans to develop such a system and training will only be directed at city government staff and practitioners. The government already has frameworks in place for engagement with communities, however, there are issues with the implementation. There are also informal initiatives at the sub-city and community level for service delivery. The city needs to leverage informal initiatives and strengthen formal ones in order have more efficient engagements. This includes capacity building for city officials and community members alike as well as stronger coordination efforts since there are many fragmented initiatives.

Priority Investments

Address water scarcity with a two-pronged approach focusing on improved efficiency and protection of the existing supply system, and additional water sources. Currently, Addis has two sources of water, surface and groundwater, in a roughly 40:60 proportion, totaling 450,000 m3 per day. Failure of any of these water sources would result in a crisis. Addis must address the estimated 36.5 percent leakage of water supply in the system as a means of ensuring that more potable water is made available for the population, through a combination of methods, including improved maintenance and faster response to reported breakages. The city needs to improve the operational efficiency and monitoring at well fields to maximize their potential and avoid over extraction. All piped water in Addis meets minimum WHO standards, but the discharge of waste into rivers affects the quality of groundwater in the central city, while urbanization around dams affects surface water quality because households are improperly discharging waste. These issues need to be raised at the metropolitan level to coordinate better for planning and implementation purposes. In addition to improved efficiency and protection of existing water supply, Addis will need to develop new sources of water. Alternatives need to be explored to harness rainwater and stormwater catchments for grey-water uses such as industry, landscaping, and cleaning.

Pilot urban densification using a transit oriented development and integrated municipal management approach. As part of the implementation of the Integrated Development Plan, the city should select targeted sites for intensive public investments, private sector engagement, and institutional coordination. These pilots for urban densification should be aligned with transport investments, especially public transportation, and supported by cross-agency technical teams to ensure the quality of local development plans, adequacy of infrastructure delivery, enforcement of building and safety codes, and readiness of private sector to take advantage of opportunities for investment.

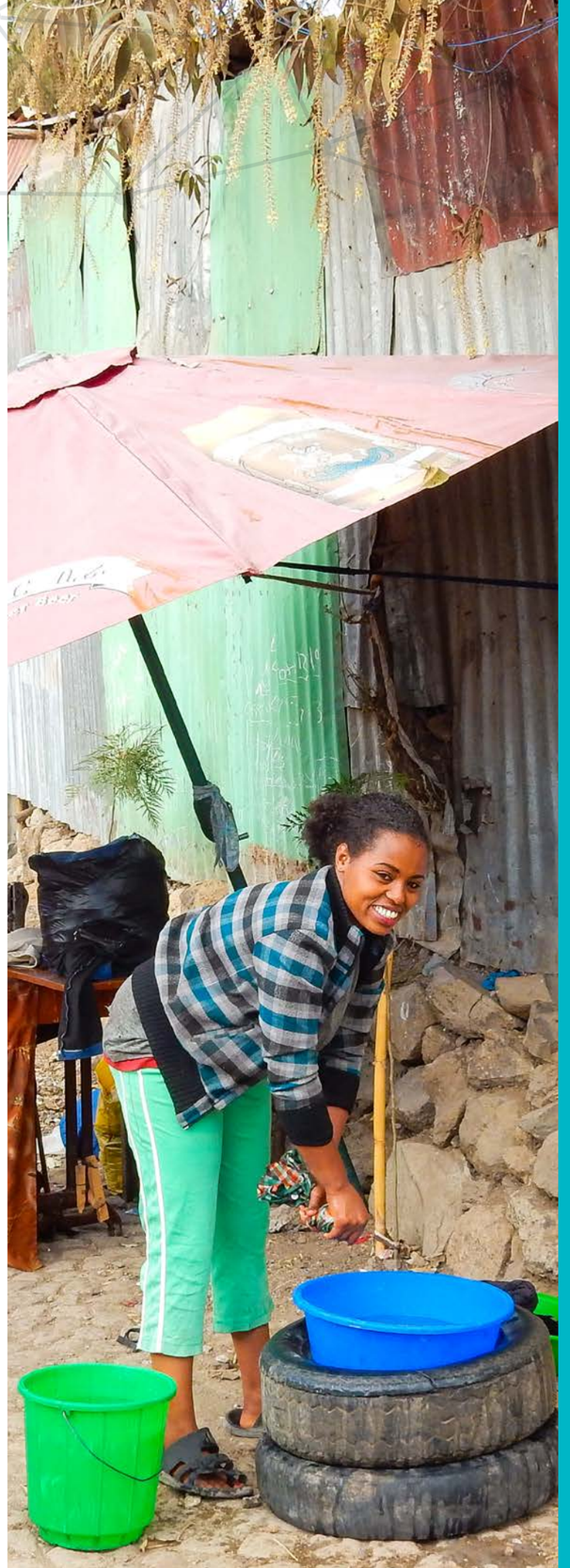
Establish mass transport skeletal services to shape metropolitan growth. While upgrading and redevelopment in the city center is laudable and should be pursued, it will not be possible to meet the pace of expected urban growth solely through measures aimed at redevelopment of existing core areas. Efforts need to be taken to ensure that fringe growth is orderly and that viable and affordable transportation options exist. This includes moving quickly to establish mass transport skeletal services to shape metropolitan growth. Even if the full implementation of mass transport services is not feasible in the near future, efforts should be made to send signals to (emerging) land and property markets about where these services will be established. For example, express bus services could quickly be established along future BRT, LRT, and MRT routes, protected with modest investments that can be elaborated upon later.

Reduce urban flooding in order to protect lives and property as well as to enhance mobility during the rainy season. Perennial flooding in Addis stems from river overflow and poor stormwater drainage capacity. To address the former requires better management of river catchments and the related network of secondary drainage, resettlement of vulnerable households

encroaching on reservation areas, and stabilization of eroding river banks. It is estimated that two-thirds of the population in flood prone areas live in mud and wood constructions that are particularly vulnerable to flood action. The second course of intervention includes upgrades to drainage on the ring road, expansion of stormwater drainage systems in low-lying areas of the city, and installation of water retention ponds (which could also serve as a source of grey-water). The design of urban sub-surface drainage systems to carry future peak floods may not be economical, and strategies to manage run-off from flash floods need to be developed as part of a drainage master plan.

Ensure coverage and reliability of basic services, including wastewater collection and treatment and energy distribution. It is estimated that only 25-30% of households in Addis have wastewater collection, either through piped sewer line or vacuum trucks. The city's goal is to reach 50% coverage by 2020. This will require continued investment in piped sewerage and decentralized treatment facilities. Treatment capacity is currently exceeded and excess waste is deposited in water bodies. In regard to energy, stakeholders highlighted service disruption as a stress in the city. The access rate in the city is close to 100%, but outages and interruptions are very frequent. In Ethiopia, current total energy production meets demand and, in fact, generates a surplus available for export. The projected rapid growth in population and intensity of urbanization will require an increase in generation capacity and an efficient transmission and distribution system. In particular, the projected increase in demand for electricity in the city will stress the current system and require a reinforcement of transmission corridors from western and north western regions to Addis and the continuous upgrading and expansion of existing substations which are more than 40 years old. Both AACG and the utilities should put in place a collaboration mechanism to ensure proper and timely planning of needed infrastructure to match the city development.

Introduce an effectively targeted productive safety net and complementary livelihoods interventions in Addis Ababa to support vulnerable groups and households impacted by shocks. The delivery of a predictable, timely, adequate and productive safety net through conditional and unconditional transfers is a fundamental building block of urban resilience and can serve as a buffer in the face of economic shocks and natural disasters. At 22%, the poverty rate of Addis is just below the urban average for Ethiopia (25.7%), and progress in reducing poverty over the last decade has been slow. As more of the poor live in large urban centers, expanding development programs to address key challenges to urban poverty reduction is imperative. Moreover, it is important to note that shocks and stresses impact the poor more severely due to pre-existing vulnerabilities, social inequality, and lack of voice. The inclusion of design features that will allow the envisaged safety net to respond to the needs of poor households impacted by flood, fire, or earthquake should be considered, in the ongoing projects.



Immediate Measures

The following table highlights a set of immediate measures that Addis Ababa can take to begin the process of enhancing its resilience. *What* explains the action that needs to be implemented. *How* outlines the necessary activities required to implement the action. *Why* explains the rationale for the action. And, *Who* gives an indication of the most likely department or institution that could be responsible for implementing the action or for providing the necessary input.

WHAT	**Focus on implementing the Integrated Development Plan**	**Strengthen risk management initiatives**	**Address localized flooding**	**Better understand vulnerable groups**	**Identify new sources of water**	**Pilot urban densification**
HOW	Create an implementation 'business plan' and provide targeted support to sub-cities for the preparation of Local Development Plans	Establish a disaster risk management and climate change adaptation coordination unit under the Mayor	Prepare a new urban drainage master plan and begin studying the link between solid waste management and flash flooding	Perform an extensive study of the most vulnerable groups in the city	Explore alternatives to harness rainwater and stormwater catchments for grey-water uses	Select targeted sites for intensive public investments, private sector engagement, and institutional coordination
WHY	Achieving the goal of a safe and liveable city requires coordinated action across multiple agencies in the city	FEPRA has limited capacity with regard to comprehensive disaster risk management, and there is little to no coordination among city agencies and bureaus	Stormwater run-off has been increasing, resulting in more frequent flash floods and widespread disruption to the road network	There is evidence that the categorized approach to addressing social protection is ineffective because some people fall into multiple groups	Addis needs to develop new sources of water to meet growing demand	To address lack of coordination among city departments and tendency toward sprawling development patterns
WHO	Addis Ababa City Planning Project Office and Urban Planning Institute	Mayor's Office in collaboration with FEPRA	AACRA	BOLSA	AAWSA	Addis Ababa City Planning Project Office and Urban Planning Institute

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