The Urban Opportunity: Enabling Transformative and Sustainable Development

BACKGROUND RESEARCH PAPER

Aromar Revi and Cynthia Rosenzweig

Submitted to the
High Level Panel on the Post-2015 Development Agenda

May 2013

The Urban Opportunity:
Enabling Transformative and Sustainable Development

Background Paper for the

High-Level Panel of Eminent Persons on the Post-2015 Development Agenda

Prepared by the Sustainable Development Solutions Network
Thematic Group on Sustainable Cities

Co-Chairs
Aromar Revi, Director, Indian Institute of Human Settlements, Bangalore
Cynthia Rosenzweig, Senior Research Scientist, NASA Goddard Institute for Space Studies and Earth Institute at Columbia University, New York

Members
Zubaid Ahmed (Citi Institutional Clients Group), Tania Araujo-Jorge (Oswaldo Cruz Foundation), Frances Beinecke (Natural Resources Defense Council), Somsook Boonyabancha (Asian Coalition for Housing Rights), Martha Delgado (Global Cities Covenant on Climate Secretariat), Shobhakar Dhakal (Asian Institute of Technology), Peter Head (Ecosequestration Trust), Vijay Jagannathan (World Resources Institute), Israel Klabin (Brazilian Foundation for Sustainable Development), Shagun Mehrotra (The New School University), Claude Nahon (EDF France), Martin Oteng-Ababio (University of Ghana, Legon), Steward Pickett (Cary Institute of Ecosystem Studies), Edgar Pieterse (University of Cape Town), Debra Roberts (eThekwini Municipality), Josep Roig (United Cities and Local Governments), Jonathan Rose (Jonathan Rose Companies), David Satterthwaite (International Institute for Environment and Development), William Solecki (CUNY Institute for Sustainable Cities), John Thwaites (Monash Sustainability Institute, ClimateWorks Australia), Rafael Tuts (UN-Habitat), Elaine Weidman (Ericsson)

Program Manager
Bonnie Scarborough

Coordinating Lead Authors
Aromar Revi, Cynthia Rosenzweig, Shagun Mehrotra, William Solecki

Bellagio Writing Team
Shobhakar Dhakal, Amanda Eaken, Peter Head, Garima Jain, Manfred Konukiewitz, Carole Ory, Martin Oteng-Ababio, Aromar Revi, Cynthia Rosenzweig, Josep Roig, David Satterthwaite, Bonnie Scarborough, Guido Schmidt-Traub, Emma Torres, Rafael Tuts

Research Scientists
Somayya Ali, Garima Jain, Matthew Woundy, Susan Yoon

May 20, 2013

Table of Contents

Executive Summary

Cities are home to half the world's seven billion people. Current urbanization trends indicate that an additional three billion people will be living in cities by 2050, increasing the urban share of the world's population to two-thirds. Cities face major challenges—extreme urban poverty, poor living conditions for one billion slum dwellers, constraints on productivity due to lack of basic infrastructure, and risks due to natural disasters and climate change. However, they also have an extraordinary potential for transformational change due to their: concentration of economic activity, potential for social transformation, high levels of annual investment in infrastructure and buildings, high degree of innovation, nimble local governments, connection to surrounding rural and natural environments, ability to reduce eco-footprints by densification, and suitability for systems-based solutions. A Sustainable Development Goal (SDG) on cities could maximize the potential for the dynamics of global urbanization to be directed towards sustainable development solutions for pressing urban problems.

We propose a post-2015 Sustainable Development Goal (SDG) to "Empower Inclusive, Productive, and Resilient Cities." The draft goal aims to "make all cities socially inclusive, economically productive, environmentally sustainable, and resilient to climate change and other risks." In addition, the goal proposes that cities "develop participative, accountable and effective city governance to support rapid and equitable urban transformation." An urban SDG might include the following three targets:

- Eliminate extreme urban poverty, expand employment and productivity, and raise living standards, especially in slums and informal settlements.

- Ensure universal access to a secure and affordable built environment and basic urban services: housing, water, sanitation and waste management; low-carbon energy and transportation; and communication.
- Ensure safe air quality and water quality for all, and integrate reductions in greenhouse gas emissions, efficient land and resource use, and climate and disaster resilience into investments and standards.

The success of the SDGs will be determined to a large extent in the world's cities, which lie at the fulcrum of employment creation, eradication of extreme poverty, inclusive economic growth, and environmental sustainability. The proposed framework of targets and indicators provides a roadmap for operationalizing an urban SDG. The framework lays out the tasks needed to build urban capacity to address sustainability goals, and the metrics by which to identify success and measure it at the appropriate level of action: neighbourhood, city, region, or nation.

To reduce urban poverty in all its forms, end slum formation, increase productivity, and promote conditions for global sustainability, cities will need to ensure universal access to basic urban infrastructure and services: housing, water, sanitation, waste management, low-carbon energy and transportation, and information and communication technologies. Urban areas must invest in strategies to increase resilience to disasters, extreme weather events, and other threats of climate change. Transformational technologies, such as information and communications technologies, can help improve city governance, energy and resource use efficiency, and delivery of urban services, and create new employment opportunities. Equitable and efficient urban land and resource use is essential, as is nurturing urban ecological integrity and its linkages to rural and regional systems.

To harness the potential of sustainable urbanization, city governance will have to be improved in virtually every country. Metropolitan areas and urban local governments will be at the center of decision-making and therefore need to be empowered, but they must work with many actors: e.g. national governments, local authorities, businesses, knowledge institutions, and civil society. Together these actors must mobilize the needed financial, institutional and human resources across a broad range of urban issues, such as jobs, housing, services, and infrastructure.

This document has been prepared by the Sustainable Cities thematic group of the Sustainable Development Solutions Network (SDSN) for submission to the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. We gratefully acknowledge the support of the Rockefeller Foundation in the preparation of this report. The findings, interpretations, and conclusions expressed in this paper are those of the thematic group members alone. They do not necessarily represent the views of their affiliated organizations.

Chapter 1. Introduction

The Millennium Declaration in 2000 and the Millennium Development Goals (MDGs) successfully focused the world's attention and action on ending extreme poverty by 2015. In 2012, the Rio+20 Summit resolved to finish the job, and called for a new set of goals, the Sustainable Development Goals (SDGs). Sustainable development was envisioned as a holistic concept addressing four dimensions: economic development, social inclusion, environmental sustainability, and good governance.

The Sustainable Development Solutions Network (SDSN) was launched by the United Nations Secretary General in 2012 to mobilize global scientific and technological knowledge to focus on the challenges of sustainable development. The SDSN is organized into thematic groups around key issues such as poverty, health, education, energy, and cities. The SDSN has proposed ten priority challenges, which may form a plausible basis for the SDGs called for at Rio+20. In this paper, the SDSN thematic group on "Sustainable Cities" outlines the historic opportunity currently faced by the global community to transform cities[1] along sustainable development pathways and to leverage the growth, investment, and social and technological innovation that will occur in cities over the next several decades.

1.1 Empowering Inclusive, Productive, and Resilient Cities

The SDSN proposes that an SDG to "Empower Inclusive, Productive, and Resilient Cities" be considered.[2] This draft goal aims to "make all cities socially inclusive, economically productive,

1 In this paper we use the terms "cities" and "urban areas" interchangeably to denote metropolitan areas and all urban centers that have economic or political importance.
2 Sustainable Development Solutions Network (SDSN), "An Action Agenda for Sustainable Development." Available online at: http://unsdsn.org/resources/.

environmentally sustainable, and resilient to climate change and other risks." In addition, the goal proposes that all cities "develop participative, accountable and effective city governance to support rapid and equitable urban transformation." The draft goal might include these three targets:

- Eliminate extreme urban poverty, expand employment and productivity, and raise living standards, especially in slums and informal settlements.
- Ensure universal access to a secure and affordable built environment and basic urban services: housing, water, sanitation and waste management; low-carbon energy and transportation; and communication.
- Ensure safe air quality and water quality for all, and integrate reductions in greenhouse gas emissions, efficient land and resource use, and climate and disaster resilience into investments and standards.

These three targets provide a framework for promoting sustainable development in cities. Although issues such as health, education, and agriculture are of vital importance to cities and their inhabitants, the draft urban SDG does not explicitly address them because they are addressed in other proposed SDGs.

The targets presented here focus on three critical issues for cities that will not be covered elsewhere. Each target contains multiple elements, analyzed in greater detail below. The significant roles played by the crosscutting processes of urban governance, financing, and urban planning are also examined. In order to delineate how progress towards the targets can be measured and evaluated, a preliminary set of indicators is proposed.

Cities around the world are highly diverse. The needs and priorities of cities in low-income countries are different from those in middle- or high-income countries. The challenges and opportunities faced by small- and medium-sized cities are different from those faced by mega-cities with populations of 10 million or more. These cities are now deeply interconnected, however, via the global economic system; information, trade, and financial flows; and global environmental challenges such as climate change and biodiversity loss. Despite their diversity, there are many common themes that run through cities.

1.2 Urban Sustainability, Human Rights, and the "Right to the City"

The proposed urban SDG is based on local, national, and global targets. These targets are based on a set of assertions derived from an established United Nations human rights framework. The most elaborated right related to sustainable cities is the right to adequate housing, which includes several core elements: legal *security of tenure*, including *protection against forced evictions*; *availability of services*, including safe drinking water, adequate sanitation, energy for cooking, heating, lighting, food storage and refuse disposal; *affordability*, in that housing costs should not compromise occupants' enjoyment of other human rights; *accessibility*, taking into account the needs of disadvantaged and marginalized groups; *habitability*, providing physical safety, adequate space, protection from the elements; *location*, in relation to employment opportunities, health care, schools, childcare centers; and *cultural adequacy* (CESCR, 1991).

Another powerful principle that has partially informed the work of this paper is the concept of the "Right to the City", conceived as a demand for a transformed and renewed access to urban life (Lefebvre, 1996). It has been described as "more than the individual liberty to access urban resources: it is a right to change ourselves by changing the city. It is moreover, a common, rather

than an individual right, since this transformation depends on the exercise of the collective power to reshape the processes of urbanization" (Harvey, 2008). A number of popular movements, including the slum and shack dwellers movement, have incorporated the idea into their struggles. As a result, in 2001, Brazil passed a federal law premised on the idea of the "Right to the City" that created a new legal-urban order to provide land access and equity in large urban cities that has influenced thinking and policymaking around sustainable cities in many parts of the world.

1.3 The Urban Opportunity

The on going transformation to a global urban society offers an unprecedented opportunity to use the urbanization process as a catalyst for sustainable economic and social development. Well-managed cities that are highly connected can use technology effectively to enable greater equity and inclusion, can improve societal wellbeing and achieve greater economic growth at lower rates of resource use, greenhouse gas emissions, and social costs.

For the first time in human history, a majority of the world's population now lives in urban areas. Projections indicate that the urban portion of the global population will continue to rise over the next few decades, reaching 67 per cent by 2050 (DESA, 2012). For this reason alone, sustainable development efforts must focus strongly on urban areas. In addition, cities have special characteristics that make them particularly effective as platforms for transformative and sustainable development:

- **Cities concentrate and can accelerate economic activity**. The concentration of economic activity in cities contributes significantly to national and global output and employment. Today, 600 cities account for 60 per cent of the world's gross domestic

product (GDP) (McKinsey, 2011).[3] Hence, cities are key drivers and participants in a sustainable development transition.

- **Urban infrastructure investment can enable growth, employment, and poverty reduction.** Annual urban infrastructure and building investments are expected to rise globally from $10 trillion today to more than $20 trillion by 2025, with urban centers in emerging economies attracting the majority of this investment (Dobbs, 2012). Investment decisions in sustainable long-term urban infrastructure can have far-reaching impacts on the social and economic welfare of urban dwellers, environmental sustainability, and climate resilience.

- **Urban areas are sites of social transformation.** In many parts of the world, urban areas have enabled social transformation and inclusion through processes such as investment in human development, addressing asymmetries of gender, race, age and ethnicity and the participation of citizens in governance.

- **Local governments are nimble**. Local city governments often have the ability to respond more rapidly to the needs of their populations. They can therefore more quickly and flexibly adapt their policies and actions to follow sustainable development pathways.

- **Cities are sites of innovation.** Cities are the crossroads where diverse cultures meet, contest, evolve, and change. They represent and offer rich opportunities for creativity, new ideas, and synergy between groups. The geographic concentration of cities promotes new knowledge generation and the spread of ideas and creativity. Cities are therefore

3 Across countries, the urban share of national GDP ranges from an average of 55 per cent in low-income developing countries to an average of 85 per cent in high-income developed countries. In each case, urban share of GDP exceeds the urban share of population (Weiss, 2005).

prime locations for demonstrating emerging technologies, as well as innovative social and cultural institutions.

- **Cities are interconnected with rural areas.** The development of sustainable urban centers has synergies with surrounding rural areas and communities via economic and employment linkages. Urban poverty reduction can positively impact rural poverty reduction. Rural areas help provide the ecosystem services and food security essential to urban functioning and sustainability.

- **Cities are interconnected with the natural environment.** Sustainability requires that urbanization occur within regional and planetary limits of ecological and other life-support systems. Sustainable development actions taken at the city level can significantly impact the natural environment and health, and help reduce greenhouse gas emissions and environmental change.

- **Cities have the potential to minimize our environmental footprint.** Well-managed cities that are highly connected and use technology effectively can generate greater levels of societal wellbeing and economic growth at lower rates of resource use and greenhouse gas emissions. A dense urban lifestyle can be "greener" than its rural counterpart especially in high- and many middle-income countries. Urban residents drive less and live and work in smaller footprints that require less energy, water, and materials per person.[4]

4 For example, the average New Yorker is responsible for roughly one-third of the green house gas emissions of the average American.

- **Cities are suited for systems-based approaches.** Cities are amongst the most complex and dynamic of human systems. Sustainable urban development requires a systems-based approach to transformation via economies of scale and scope and facilitating rapid social and institutional innovation. Smart new technologies for managing energy, transportation, and communications are ideally suited for networked and dense urban environments, and have the potential to transform urban areas and their surrounding regions in beneficial and sustainable ways.

Chapter 2. Ending Extreme Urban Poverty and Raising Living Standards

While cities present a unique opportunity for leadership in global sustainable development, they also face multi-dimensional challenges that must be addressed in order to realize the full potential of urban transformation. One such challenge is ending extreme urban poverty. The first target in the proposed SDG for cities is therefore to "end extreme urban poverty, expand employment and productivity, and raise living standards, especially in slums."

2.1 Urban Poverty and Slums

Cities are home to more than half of the world's population, or 3.5 billion people. Of these, one billion live in slums (World Bank, 2013). In many low- and middle-income countries, this urban poverty manifests itself in the formation of slums and informal settlements. Even in high-income countries, social exclusion, residential segregation, and persistent pockets of poverty are common in most cities. Factors that contribute to the number of urban individuals living in poverty include the 11 million refugees and 25 million persons who were internally displaced over the past two decades (UNHCR, 2006).

By 2050, projections indicate that the global urban population will grow by almost 3 billion to a total of 6.2 billion (DESA, 2012). Much of this urban population growth will occur in low- and middle-income countries, especially in Asia and Africa. Urban poverty accounts for a growing share of global poverty. By 2030, estimates indicate that 40 per cent of urban residents will live on less than $1 per day, and that over 50 per cent of urban residents will live on less than $2 per day (Ferre et al. 2011). In some regions such as Latin America, Eastern Europe, Central Asia, the Middle East and North Africa, the proportion of people living in extreme poverty in urban areas

is already over 50 per cent (Ferre et al. 2011). These figures may be even higher if multi-dimensional poverty[5] is taken into account.

As noted above, over one billion urban residents today live in such poor quality and overcrowded housing that they can be considered to be slum dwellers. Slums are often informal settlements that lack provision of basic services and where the inhabitants are at risk of eviction. Slum dwellers are typically more vulnerable to hunger, poverty, social exclusion, and crime (especially women and children). In some countries, the proportion of the urban population living in such settlements has declined, usually as a result of upgrading programs where deficiencies in the provision for basic services were addressed over the last two decades. The MDG target of a significant improvement in the lives of at least 100 million slum dwellers by 2020 was exceeded. Despite this achievement, the net number of global slum dwellers has grown significantly from 777 million in 2000 to about 830 million in 2010 (UN-Habitat, 2010).

Addressing Urban Poverty

Over the next few decades, urban economic development must be inclusive, and contribute to ending extreme urban poverty and improving the lives of slum dwellers. Most urban hunger is caused by lack of income, rather than lack of available food. All urban dwellers must have access to sustainable livelihoods and the means to pay for sufficient food for a healthy diet, as well as for essential non-food needs (e.g., housing, water, and healthcare). For those who earn too little or who are unable to find paid employment, social safety nets must be established to address these challenges and as a hedge against inflation that has a disproportionate impact on the poor.

5 The Multi-Dimensional Poverty Index developed by the United Nations Development Programme uses three dimensions of poverty (health, education, living standards) with ten corresponding indicators (child mortality nutrition, years of school, children enrolled, cooking fuel, toilet, water, electricity, floor, assets). This definition reveals different patterns than income poverty. Source: UNDP, 2013.

Short-term solutions to increasing income in some middle-income countries might include conditional cash transfers, such as the Bolsa Familia in Brazil (Fenwick, 2009). The effectiveness of such schemes depends on having adequate institutional capacity to ensure that the transfers are accessible, that they are actually delivered, and that they are sufficient to ensure that both food and non-food needs are met. Longer-term solutions include the shared measures that many low-income groups also take to avoid impoverishment and hunger. For example, groups may set up savings accounts or build small asset bases that can be drawn on as needed. The scope and coverage of these support mechanisms should be enhanced.

Integrating and Improving Slums

Three interventions could help improve spatially concentrated urban poverty within cities. The first type of intervention includes granting security of land tenure, enabling the functioning of land markets, and integrating slum improvement into national, state, and local urban development plans and processes. Second, public and private financing can be targeted to extend basic services—public and quasi-public goods like water supply, sanitation, electricity, transport, and connectivity—into these low-income settlements. Third, citizen engagement can enable accountability and better governance.

Improving Nutrition via Urban Agriculture

In cities where access to food is inadequate, unreliable, or irregular, or where residents lack adequate purchasing power, urban agriculture can serve to reduce poverty and hunger. In addition, local urban agriculture can reduce the cost of food by eliminating the expense of supplying and distributing food from rural areas. These activities can expand access to fresh and nutritious food and create opportunities for urban jobs.

Growing plants and raising animals within cities and in peri-urban areas is rapidly growing in importance. Rooftops and building walls are increasingly being used for intensive agriculture, taking advantage of sunlight, rainfall capture and nutrient recycling from city waste. Currently, approximately 15 to 20 per cent of the world's food is produced in urban areas (Armar-Klemesu, 2000). Strategies that cities can use to support urban agriculture include farm to market infrastructure, safe and sufficient water, distribution services, and seed banks.

Improving Health

Cities can be associated with good health, with many cities in high- and middle-income countries having high life expectancies at birth and very low infant, child, and maternal mortality rates. But there are also many cities that perform poorly, with infant, child, and maternal mortality rates 20 or more times higher than in healthy cities. A good health care system can contribute much to ending poverty. Improved health care can reduce income lost to ill health and injury, and reduce mortality.

Monitoring of key health determinants is important although data on many aspects of urban health, especially morbidity and injuries, are difficult to separate from national statistics. It is also difficult to get data on measures of wellbeing such as mental health and psycho-social stressors. Urban epidemiological profiles differ significantly from rural populations and introduce new risks for urban health systems to address, especially the simultaneous growth of communicable and non-communicable disease. Universal access to good quality healthcare facilities and emergency services is critical.

Potential Indicators

- Percentage of urban population with incomes below national level, established poverty line metrics (both extreme and non-extreme[6] per cent of total)
- Proportion of population living in slums and informal settlements (per cent of total)
- Malnutrition or stunting prevalence in children under 5 years old (per cent of total)

2.2 Inclusive Economic Development

The process of urbanization is linked to a geographic concentration of economic activity and investment, an increase in the proportion of industrial and service sector employment, rising productivity, and often increased employment and economic development. This economic activity can be a driver for sustainable development, but only if means are found to ensure that the urban poor benefit.

Local economic development has been used in many cities as a successful strategy to address uneven development and extreme poverty. Pro-poor and inclusive local economic policies can enable city governments to address poverty, unemployment, social deprivation and vulnerability, by promoting youth employment, empowering marginalized communities, and promoting gender equity.

6 Note that the $1 per day per capita poverty line (and its adjustment to $1.25 a day) is not an appropriate indicator of urban poverty. It does not adequately allow for the non-food needs that must be paid for in cities, such as accommodation, water, etc.

Informal Economies

Although statistics on the informal economy are unreliable, estimates indicate that the informal sector makes up between 48 and 72 percent of non-agricultural employment in North Africa, Latin America, and sub-Saharan Africa. Estimates for high-income countries are around 15 percent (ILO, 2002). Informal economies are diverse, and can include a wide variety of activities, such as domestic workers, garment workers, street vendors, crafts people, garbage recyclers, and waste pickers. They can include domestic manufacturing, household and small-scale enterprises, and larger enterprises such as para-transit systems (Carr and Chen, 2001).

The relationship between the informal sector and poverty is complex. On the one hand, significant income and gender inequalities exist. Average incomes in the informal sector are substantially lower than in the formal sector, with little or no social security and high occupational health and safety risks. Furthermore, in many parts of the world, a majority of informal sector workers are women. On the other hand, these conditions are contrasted with the observation that labor productivity in some informal occupations can be higher than that of formal occupations.

To ensure that economic development benefits the poor, a greater recognition of the importance of the informal economy is needed, as well as less harassment of those in informal employment, such as waste pickers and street vendors. City government must recognize the importance of the informal economy, and the informal settlements that house much of the labor force that the city's prosperity depends on. Ways to address the challenges of the informal sector include: establishing a system of urban entitlements; establishing an urban social safety net; and formalizing informal jobs through state regulation. Initiatives that have been helpful in promoting greater income and employment equity within the informal sector and with the more

formal economic sectors of society include: securing identities; enabling land rights; and providing financial access and inclusion, for example, via microcredit.

Potential Indicators

- Share of urban informal sector of national GDP (per cent of total)
- Annual urban net employment creation rate by sector (formal, informal, gender, age) (per cent)
- Ratio of urban unemployment to national unemployment rate (ratio)
- Urban workforce participation rate by gender and age (per cent of total)
- Urban gender wage disparity index (ratio)
- Share of urban informal sector workers with access to social protection and security (per cent of total)
- Urban mean annual growth in value added per worker (per cent)

Chapter 3. Universal Access to Basic Urban Services and Housing

The second target in the proposed SDG on cities is to "provide universal access to a secure and affordable built environment and basic urban services: housing, water, sanitation and waste management, low-carbon energy and transport, and communication."

3.1 Access to Basic Infrastructure Services

As noted above, annual investments in urban buildings and infrastructure are expected to increase from the present $10 trillion to $20 trillion in the coming decades (Dobbs, 2012), providing an important opportunity to alleviate poverty and promote sustainable development through investment. Cities offer economies of scale and scope for both economic activity and the provision of basic infrastructure services (water, sanitation and waste management, energy, transportation, and communications). Investment in these services provides additional multiplier benefits to city, regional, and national economies. The sound management of urban services is therefore central to cities' capacity to enable prosperity.

Providing basic services—safe, sufficient and affordable water, safe and accessible sanitation and ecologically efficient waste management, and energy access for all—is fundamental to the health and wellbeing of urban dwellers and a necessary condition for economic development, innovation and prosperity. The most dramatic reduction in the burden of disease and child mortality has been enabled by improvements in these services. Lack of functioning infrastructure and inequitable provision of basic urban services contributes to social instability in cities.

Access to Water Supply

Estimates indicate that individuals need 20 to 50 liters of water per day to ensure that basic needs are met for drinking, cooking, and cleaning (WWAP, 2013). Access to water continues to be a problem in many low- and middle-income countries today, with over 780 million people lacking access to improved sources of drinking water (WHO and UNICEF, 2012).

Access to Sanitation and Waste Management Services

Adequate sanitation services, including safe disposal of human waste, garbage collection, and wastewater disposal, are essential for ensuring the health and wellbeing of urban dwellers. Inadequate sanitation is a major cause of disease, and improvements in sanitation have been shown to have significant beneficial health impacts both in households and across communities. In 2010, an estimated 2.5 billion people worldwide lacked access to basic sanitation services (WHO and UNICEF, 2012). Although limited data is available on the urban population, it is estimated that in 2000 at least 850 million lacked adequate sanitation (UN-Habitat, 2003). Most cities and smaller urban centres in sub-Saharan Africa and many in Asia have no sewers, and in the ones that do, this reaches a fraction of their population.

Fewer than 35 per cent of cities in low- and middle-income countries have their wastewater treated (Mara, 2012). Key challenges to effective waste management include integrating the informal waste sector in developing cities and reducing generation and consumption in developed cities. Particularly in high-income countries, cities must strive to reduce waste

contributions to landfills by implementing recycling and composting programs, consistent with a goal of generating close to zero waste.[7]

Access to Energy Services

Universal access to affordable, efficient, and low-carbon energy services is essential for inclusive economic development. For some parts of the world, such as urban South Asia and sub-Saharan Africa, access to energy is a key challenge. About 1.3 billion people in the world do not have access to electricity and this number could grow as the population increases (IEA, 2012). Among urban populations, 700 million lacked access to clean fuels in 2005, with 279 million lacking electricity (Mitlin and Satterthwaite, 2012). Energy access for all can be promoted by:

- Providing cost-effective, reliable, and available low-carbon generation, transmission, and distribution of energy
- Providing energy-efficient centralized and decentralized systems appropriate for housing, enterprises, lifeline and social infrastructure.
- Strengthening market and regulatory mechanisms to enable realistic pricing of energy and carbon-emissions with targeted support for poor households and small enterprises.

In other parts of the world, the key challenge is to reduce greenhouse gas emissions by reducing overall energy use, increasing energy efficiency, and increasing use of renewable energy. Current market and regulatory conditions are not sufficient to drive the global development and deployment of low-carbon technology to the extent necessary for the challenge to be met.

7 Zero waste is a philosophy that encourages the redesign of resource life cycles so that all products are reused. Any trash sent to landfills and incinerators is minimal. See for example: http://zerowasteinstitute.org.

Success will require a stronger collaboration between stakeholders and urgent action by governments, in particular:

- Increasing energy efficiency, using an appropriate nationally determined fuel mix that enables energy security with agreed upon environmental safeguards and continuous performance improvements;
- Modifying urban structure, resource flows, mobility systems and building performance to dramatically reduce energy intensity and carbon emissions;
- Deploying large-scale energy efficiency, conservation, smart grid and low-carbon energy systems and technologies at scale through partnerships and pooled research and development for emerging clean energy technologies.

Access to Mobility Services

Mobility is critical to successful urbanization, as well as social and economic development. It connects people to jobs, markets, essential services and political representation. It enables businesses to contribute to development, by serving new markets and unlocking new resources. Access to mobility is unequal, both between high-income and low-income countries, and within countries and cities. The poor make fewer trips and spend a greater proportion of their time and income getting to where they want to go (WBCSD, 2007).

Urban mobility challenges must be addressed to enable inclusive economic development and job creation in cities and mitigate rapidly growing traffic congestion, air pollution, and greenhouse gas emissions. Cities should prioritize access to: affordable, low-carbon mobility solutions such as public transportation; safe, active mobility solutions such as walking and biking; and innovative mobility solutions such as shared, purpose-built, lightweight, and/or electric vehicles.

Sound land use planning integrated with transportation planning can provide the affordable access, appropriate densities, mix of land-uses, and safety for vulnerable populations that make these low-carbon transportation solutions feasible.

Information and Communications Technology

Urban dwellers live in an increasingly networked and globally interconnected world, where ICT can play a crucial role in achieving urban sustainable development. These technologies enable participation, a freer flow of information and knowledge, and greater opportunity to encounter diversity. They provide opportunities for creating new enterprises and expanding existing ones, developing and disseminating educational programs, and stimulating cultural activities.

ICTs can be used to efficiently and effectively manage finite resources in an urbanizing world, with the potential to reduce water consumption, provide more efficient electricity distribution, and reduce pollution levels and congestion through better traffic management. In addition, they can bring services such as health, education, shopping, and work into the home (ITU, 2013).

To realize these potential benefits, applications must work together and interoperate regardless of service provider or vendor. Achieving this will require the development of international standards, harmonized frequency spectrum, and the application of enabling policies and best practices (ITU, 2013).

Potential Indicators

- Share of urban households with access to safe, sufficient drinking water (per cent of total)
- Share of urban households served by safe sanitation services (per cent of total)
- Share of urban households provided with waste collection and management services, including recycling and composting services (per cent of total)

- Proportion of solid waste diverted from landfills to meet zero waste goal (per cent of total)
- Share of urban households and businesses with access to affordable[8] and reliable low-carbon energy (per cent of total)
- Share of urban households with access to cell phones and high speed internet connections (number per 100 inhabitants)

3.2 Affordable Housing for All

To end extreme urban poverty, provide basic services, and raise living standards, cities must provide access to housing that is safe, affordable, and of adequate quality. In cities, housing becomes unaffordable, not just as a consequence of poverty, but also as a consequence of families needing to spend a large portion of their income on other basic needs, such as food, water, clothing, healthcare, and education. Higher levels of food insecurity are typically associated with an increased share of income spent on housing.

Upgrading Slums

Slums, by definition, consist of low quality housing with inadequate access to basic services (UN-Habitat, 2003). Sustainable urban development must focus on raising the living standards of slum dwellers. Slum upgrading is a well-established strategy that can benefit all residents, rather than select beneficiaries, and can effectively induce investments using incentives such as tenure security, housing formalization, infrastructure improvement, and livelihood creation. Imposing formal building standards in slum areas as a strategy to promote upgrading has often been

8 Definition of affordable includes the percentage of household income spent on energy. Accessibility includes not just availability, but also ability to purchase and reliability.

counterproductive, and resulted in a lack of access to shelter for the urban poor. Urban slums in inner cities are often located on lands that have become increasingly valuable and contested. Forced evictions then may occur, although they are contrary to the norms of international law and well-established practices of *in situ* local economic development and upgrading (COHRE, 2006). Forced evictions need to be addressed via enabling law and policy.

Mechanisms for Ensuring Affordable Housing

Slums and informal settlements are not a stand-alone phenomenon; they are linked to urban planning and development practices. Most cities, across low-, middle-, or high-income countries, face challenges in providing affordable housing and universal service coverage, especially during periods of rapid growth or decline. City housing policies and strategies sometimes fail to match supply with demand, resulting in large numbers of vacant housing units and inadequate supply of affordable ownership and rental housing. Slum upgrading is most successful as part of a longer-term framework of urban and housing policies, underpinned by appropriate planning. Sustainable housing development strategies recognize the need to: integrate housing with mixed urban land uses at appropriate densities; improve mobility; provide access to employment; and integrate social groups to enable inclusion.

Given stratification of incomes, a diversity of tenure types including ownership, cooperatives, shared leaseholds, and various forms of renting and condominiums, are effective in enabling universal access to housing in most cities. Adequate security of tenure is an important guarantee of the welfare of households, and a stimulus to improvements and expansion.

A variety of housing finance options should be explored and made available, including mortgage finance, financing for social and rental housing, non-collateral credit mechanisms for owner-builders, credit for developers, contractors, and producers of building materials and components.

Cross-subsidy mechanisms, within urban projects, between commercial and housing land uses, and between high-cost and low-cost housing are important to encourage socially mixed development.

Potential Indicators

- Proportion of urban population living in slums and informal settlements (per cent to total)
- Proportion of urban population living in adequate housing conditions (per cent to total)
- Total number of urban households subject to forced evictions (number)
- Proportion of urban households living in mixed use and mixed-income neighbourhoods (per cent to total)

Chapter 4. Resiliency and Environmental Sustainability

The third target in the proposed urban SDG is to "ensure safe air and water quality for all, and integrate reductions in greenhouse gas emissions, efficient land and resource use, and climate and disaster resilience into investments and standards."

4.1 Access to Clean Water and Air in Cities

Water and air pollution are among the most severe and chronic challenges faced by low- and middle-income cities, whose environmental infrastructure and regulatory capacity are significantly impacted by rapid growth, inadequate ability to invest in advance of new development, and large areas of informal settlements with poor or non-existent services.

Inadequate water quality and indoor and outdoor air quality leads to millions of premature deaths each year, especially among children and others who are health compromised (Murray et al, 2010). Environmental health improvements in high-income countries resulted from the transformation of universal drinking water standards and increased access to municipal water, sanitation, and drainage services. This transformation should be extended to all cities, taking into account environmental and resource constraints, to support the process of poverty reduction and slum upgrading.

Air pollution has been successfully reduced through a combination of interventions: shifting to clean manufacturing techniques; creating incentives for compact urban development, inner city renewal, and appropriate planning regulations; transitioning to public and active transport, clean household and transportation fuels, and more energy-efficient vehicles; strengthening ICT access to reduce commuting; creating disincentives to unsustainable transportation; and strong

regulation of highly polluting enterprises. A package of these interventions will need to be customised to the requirements of individual cities, given their diversity of incomes, fuel sources, spatial structures, mix of transport modes, and institutional capacities.

4.2 Climate Change and Cities

Climate change is the predominant 21st century global environmental threat. Urban areas contribute up to 70 per cent of greenhouse gas emissions, primarily because of the concentration of industrial production and construction within urban centers (IEA, 2008). A transition by 2050 from fossil-fuel dominated urban energy systems through low-carbon to renewable energy systems for cities across the world is one of the most important factors that could halt the onset of climate change. The speed and form of this transition will strongly determine the economic, environmental, and social disruption that climate variability and change can cause. A range of strategies and instruments will be required to address the diversity of urban systems and their 'metabolisms' across the world.

Increased Urban Vulnerability to Climate Change

The continued accelerated growth in greenhouse gas (GHG) emissions is projected to significantly impact urban communities and major urban sectors including food, water, transportation and energy systems and public health. A four-fold increase and rise in intensity of urban natural disasters since 1975 illustrates how cities and their inhabitants have become more exposed and vulnerable to extreme weather and climate events (UNISDR, 2011). The further onset of climate change is projected to exacerbate these trends. Cities are expected to experience these impacts in the form of enhanced variability and changing frequency and intensity of

extreme events, such as heat waves, intense droughts, and riverine and street level floods that can compromise water supplies and human health. For coastal cities, impacts can include enhanced sea level rise and storm surges that will affect inhabitants as well as essential critical infrastructure, and ecosystems.

Disaster Risk Reduction, Climate Adaptation and Resiliency

The challenge of climate change highlights the need for cities to rethink how assets are deployed and people protected, how infrastructure investments are prioritized, and how climate mitigation and adaptation is integrated into long-term growth and development plans. Climate mitigation, adaptation and resilience planning, and disaster risk reduction are frequently discussed as separate processes rather than together.

A new resilience paradigm is emerging for cities on how they can continue to develop while developing and integrating climate mitigation and adaptation plans. In most cities across the world, data is increasingly available to determine current and future climate hazards; emissions inventories; vulnerability of populations, buildings, and lifeline infrastructure, and community and institutional capacity that can serve as a foundation to build local resilience.

New Urbanisation, Investment, and Harnessing Synergies

Guiding new urbanization and redevelopment in existing cities needs to be consistent with enhanced climate resiliency and integrating climate concerns into investment decisions. This is a key transformative opportunity to move toward a more sustainable development pathway. While cities continue to grapple with traditional issues around access to urban infrastructure and services, they are forced to provide that access at ever-greater speeds, sometimes resulting in the failure to consider and plan for risks posed by disasters and climate change.

Making infrastructure investments through the lens of climate change can pose challenges, since immediate needs can sometimes supercede long-term and more globally-oriented responses. Emphasizing the co-benefits of climate mitigation and adaptation strategies can help build support for these policies. For example, infrastructure to promote safe walking and cycling, in addition to reducing GHGs from transportation and increasing resilience, can improve air quality and ameliorate public health. Harnessing such synergies will be a key to success.

Potential Indicators

- Proportion of cities/regions with robust, meaningful Climate Action Plans including mitigation and adaptation strategies (per cent of total)
- Proportion of cities/regions with a performance framework in place to analyse whether public investments will reduce GHG emissions (per cent of total)
- Proportion of public investment consistent with goals of reducing GHG emissions (per cent of total)
- Proportion of public investment spent preparing for worst impacts of climate change (per cent of total)
- Proportion of cities/regions with a completed climate and other disaster risk vulnerability assessment (per cent of total)
- Proportion of cities/regions with framework in place to target investments to protecting vulnerable vital public assets such as hospitals, public transportation, energy systems, food distribution networks (per cent of total)

4.3 Urban Environmental Sustainability

Urbanization has profound implications for how societies shape, organise and manage themselves (Solecki and Leichenko, 2006). Sustainable development is only achievable if urban social and economic systems recognize that they are dependent on healthy ecological systems. Sustainability requires that urbanization occur within regional and planetary limits of ecological and other life-support systems. A central element of urban environmental sustainability is the opportunity to strengthen urban biodiversity and the level of ecosystem services provided. An urbanizing world needs specific goals for cities that ensure ecosystem integrity and the conservation of major ecosystem services.

Rethinking Urban Ecological Services to Cities

Traditional approaches to urban services do not include the vital role of ecosystem services. A rethinking of traditional approaches to urban services is now needed, as well as the development of new tools, such as valuation and restoration of ecosystem services. For example, the health of urban ecosystems depends on access to clean water and adequate soil properties and nutrients. Poorly designed or functioning city drainage can lead to soil and water contamination, flash floods, and ensuing damage to ecosystems and humans. Watershed restoration and protection should be a key objective of reconnecting hydrological processes into urban design. This includes ensuring access to and conservation of scarce water resources, especially in ecologically stressed regions of the world.

Managing a continuous influx of people and infrastructure in cities creates pressures on supporting ecosystems both within cities and in their surrounding regions. These pressures vary depending on city size, structure, and spatial organization, as well as on the vulnerability of each specific type of ecosystem. Degradation and fragmentation of urban ecosystems is an important

challenge for all cities. These can be addressed by embracing ecological strategies that will enable the provision of safe water and air for all and conservation of biodiversity, as well as a broad range of other ecosystem services for cities and their residents.

Soil quality in cities is impacted by contamination, fragmentation, fertilization, and irrigation but can be improved through soil and water management and composting of waste. These in turn will provide health and economic benefits. Successful new approaches to link isolated land parcels into continuous corridors and networks are now being tested.

Tree cover in cities makes up a significant proportion of national forestry in many countries, supports rich biodiversity, cools streets, reduces noise and dust, and slows water run-off. There is also a significant potential for carbon sequestration in cities through restoration and management of urban ecosystems. Green corridors are increasingly being established across urban areas to connect rural and wild land with the city for the benefit of both residents and urban biota. These corridors can include lake catchments for water storage, recreation areas, forests, and 'green streets' for walking and cycling. An important benefit of restoring and retaining ecological systems is to enable the active and inclusive connection of humans to nature, the benefits of which can lead to improved human health and broader understanding of the need to protect local, regional, national, and global ecosystems.

Temperature differences between urban and surrounding non-urban areas occur due to lack of vegetation and darker materials. These differences tend to more prevalent at night and can lead to increases in cooling energy loads and human health effects associated with physiological heat stress. Earth Observation satellite thermal imaging can be used to measure this and correlate with measurements of urban vegetation abundance measured by Normal Difference Vegetation Index (NVDI). Increased areas of green space and tree planting can have a significant impact on

ameliorating the urban heat island effect. As climate change impacts cities, urban ecosystems become even more important economically as a way to reduce heat island effects, buffer and store intense rainfall run-off, and enable local food production.

Potential Indicators

- Urban Biodiversity Index
- Normal Difference Vegetation Index (NDVI) from satellite data
- Urban green space per capita (sq. m. per capita)
- Proportion of city catchment subject to appropriate management (per cent of total)
- Thermal imaging of Urban Heat Island effect

Chapter 5. Mechanisms for Promoting Sustainable Cities

An essential enabling condition for achieving the three targets of the urban SDG is the "development of effective city governance and financing systems that deepen participation, accountability, and the rule of law." In addition, urban planning presents a powerful tool for implementing effective governance and bringing about sustainable change via effective land use.

5.1 Effective City Governance

Cities are emerging as an important new level of governance across the world. Rapid urbanization and urban sprawl have led to the emergence of large metropolitan regions for which a new type of governance model is required. The urban political system in many regions is widening its focus from 'government' to 'governance', decentralization, and democratization in response to the growing complexity of governing in a globalizing, multi-level context, and the need to engage a range of private sector and non-state actors.

Deepening Local Institutional Capacities

In all countries, local authorities and urban governments are challenged by the limited human, institutional, and financial resources at their disposal. In most countries local authorities are still learning how to effectively engage with citizens and interest groups around an increasingly complex agenda of change. Innovations, like participatory budgeting[9] help link municipal investments to local priorities, enable social sector funding, service provision, and financial, human and material resource flows to poorer areas of cities.

9 First developed in Brazil in the late 1980s and now extended to over 1,600 urban centers across the world.

Deepening Participation and Improving Pro-Poor Management

The physical proximity between the elites, the vulnerable and the deprived is a stark contradiction of most 21st century cities. In a youthful world bursting with aspiration of a better future, media and information access has brought exclusion to the forefront of the public imagination. To address this, city governments have a key role in using urban planning, management, and local economic development interventions to limit urban stratification, exclusion and gentrification by promoting equitable access to employment and socially diverse neighborhoods. Participative local governance helps deepen democratic participation, civic dialogue, and facilitating outcomes that enrich the quality of life of all citizens.

Diversity of cultures, in the form of heritage and knowledge, is a vital part of cities, integral to their identity and dynamism as hubs of social and human development. Culture provides identity, agency, and tools for communities to fight poverty. Integrating diversity of culture into governance, based on the needs and expectations of citizens, facilitates participation, intercultural dialogue, and the practice of equality of rights.

A New 'Voice' for Movements of the Urban Poor

Governance in cities can be strongly influenced by mobilisation of groups of the urban poor, especially if they are able to work with local governments. Inclusive participatory processes with a focus on slum upgrading and service provision for marginalized citizens have been effective in many regions in promoting economic development and reducing urban poverty. Many of the social reforms that have transformed the living conditions and health of low-income population cities in what are today high-income nations were responses to the demands of organized groups of the urban poor. Organizations and federations of slum and shack dwellers, self-employed women and waste pickers have become increasingly important in giving voice to the rights,

needs, and demands of the poor. A more inclusive city with strong local government, private sector, and civil society alliances provides the opportunity to change behavior and patterns of consumption, production, and social relations.

Over the last few decades, many communities have been unwilling to passively accept the planning decisions of politicians and technocrats that impact on their day-to-day environments. Participation by citizens groups, movements, community-based and non-governmental organizations and the important role of micro to transnational enterprises are changing the landscape of engagement and change in cities and city regions.

Deepening Multi-Scale Economic, Social, and Cultural Networks

Cities are increasingly connected to each other economically and via social and cultural ties that link together neighbourhoods and communities around concerns such as livelihood security, mobility, and water and air quality. Megacities and mega urban-regions will typically concentrate large proportions of the economic, environmental, and human resources of their countries—requiring fundamentally new modes of governance, technological and environmental management systems to enable their sustainability. Effective governance is essential to ensure that the concentrations of people, infrastructure, and enterprises work towards sustainability rather than mal-development.

5.2 Innovative Financing

Appropriate fiscal and financial instruments such as participatory budgeting can provide the investment needed for greater urban sustainability at neighbourhood, city, and regional scales. The effectiveness of new strategies is dependent on the level of transparency of governance

structures, and supported by clear evidence metrics. Intergovernmental financing systems can be restructured to enable greater capacity at local levels within cities (e.g., neighbourhood-level) and in turn provide opportunities for greater accountability and innovation. These new financial arrangements can bring together local interests, private enterprises and domestic, international and multilateral investors with a special interest in long-term environmental, equity and inclusion concerns. It is of course recognized that public resources have become increasingly strained in both developing and developed country contexts and that significant funding progress is in many cases increasingly dependent on private financing.

A city region investment fund strategy could be set up to support agreed upon regional objectives, combined with innovative new asset classes of 'green growth' funding, 'climate adaptation' funding and 'social enterprise' bonds. The advantage of such a strategy and potential portfolio approach (depending on availability of funding) is that climate adaptation can de-risk green growth infrastructure assets, and social investment bonds can support skills training to underpin local job creation from green growth investment.

Leveraging Investment Finance and Integrated Planning

Building on traditional public finance flows at city and regional levels, investment finance can be drawn down into projects that promote urban goals via a variety of institutional structures such as public-private partnerships to deliver a variety of social, environmental and economic outcomes. The use of integrated planning tools to support this could enable greater impacts to be achieved in terms of resource-efficiency and socially beneficial outcomes.

Potential Indicators

- Value of urban revenues (numbers)

- Value of market transfers (numbers)
- Value of market borrowing including foreign direct investment (per cent of GDP)

5.3 Urban Planning for More Effective Land Markets

Urban planning can be an effective mechanism to improve the lives of the urban poor, and to improve the quality and sustainability of urban life in high-income countries. In recent decades, there have been serious limitations in the planning, design, and management of urban land markets, mobility systems, and land-use planning in many low- and middle-income countries. This has lead to a range of inadequate outcomes including: rapid, un-served, peri-urban growth; growth of large slum areas and informal settlements close to employment opportunities; and hyper-dense and poorly serviced living and working conditions for millions of people. These impacts can be compounded in large metropolitan regions and urban corridors that are resource inefficient, segregated, less inclusive, and economically less competitive.

Expanding Global Urban Sprawl

Between 1980 and 2000, the footprint of urbanized areas across the world grew on average at three times the rate of population growth, resulting in an effective worldwide reduction in density in urban areas (Angel et al, 2012). These two decades of urban expansion in most high-income and a few middle-income countries have been focused on single-use and automobile-oriented development patterns. This trend has reduced the opportunity for achieving minimum densities for efficient and affordable public transportation and walkable neighbourhoods, both

hallmarks of efficient, inclusive, resilient, and accessible cities and regions. Rapid urban expansion also has been documented in many developing country settings as well.

Impact of Expanding Sprawl and Suburbanisation

Especially in high-income countries, urban sprawl brings a well-documented host of challenges including: long commutes, traffic congestion, high vehicle miles travelled, greenhouse gas emissions, loss of farmland, isolated communities, loss of walkability, public health concerns around sedentary living, and often a high household water footprint per capita. In high- and middle-income countries, new suburban communities are often geared towards higher income residents, with a housing market that has traditionally failed to provide sufficient, integrated, affordable housing. In some low- and middle-income countries, sprawl has been associated with increased metropolitan fragmentation and the peripheralisation of poverty and informal settlements. At the same time, in many lower- and middle-income countries, redevelopment of inner city areas has led to forced evictions of poor households out of inner city areas to more distant sites that require longer commutes and that have reduced access to public services.

Promoting Walkable and Efficient Cities

In order to achieve economic, social and environmental sustainability, cities and regions need to re-embrace compact, walkable, and mixed-use neighborhoods. This requires a shift away from the mono-functional city of low density and long distances, which is poorly connected, socially divided and economically inefficient. New communities can be planned and existing communities can be retrofitted to provide greater access to public transportation, job centers, and other daily amenities. Advantages include reducing travel distances, reducing travel costs, reducing transportation energy use and emissions, reducing service delivery costs, saving valuable resources and farmland, optimizing land use, promoting social diversity, and improving

public health by providing everyday opportunities for walking and cycling. The creation of walkable communities must be accompanied by the provision of accessible and enjoyable public open spaces, as well as the creation of low-carbon public transportation. Smart land use planning, zoning, and building codes should promote such mixed-use, higher density, mixed-income communities.

Reasserting the Importance of Urban Public Space

Reasserting the importance of urban public space is an effective entry point for improving a city's functioning. The ways in which space is deployed and shaped, proximity and connectivity enhanced, and land and place value developed and captured are central to the process of city development. Urban public space is the backbone of the city. It allows people to live amidst complexity, negotiate differences, assert their cultural identities and access resources in ways both formal and informal. Effective policies on the establishment, management and maintenance of urban space are the key to inclusivity, walkability, and access.

Possible Indicators

- Land resources developed per new urban resident (area per person per decade)
- Urban residential density (persons per area)
- Public open space per resident (sqm per person)
- Rate of growth of urban built-up sprawl (per cent per decade)
- Employment-housing/rental fit Index

Chapter 6. Conclusions

Rapid urbanization creates a set of significant challenges to governments, private enterprises, civil society, and communities. Collective action by and across these institutional groups can ensure a convergence of entitlements and public policy, enterprise and collective action to support this multi-dimensional transition to an urban world without significant economic, social or environmental disruption. The proposed urban SDG, focused on "empowering inclusive, productive, and resilient cities," provides a forward-looking framework to achieve sustainability for all citizens, cities, countries and the planet. While urban challenges appear daunting, there is a great opportunity for cities to play a leading if not decisive role in enabling the local, national and global transformation to sustainable development.

Urban sustainable development is complex, involving not only many sectors but also many political entities. An urban SDG is therefore an important mechanism to mobilize and bring together the efforts of multiple actors and stakeholders across a range of urban issues and mobilize the financial, institutional, and human resources to make this possible. The proposed framework of targets and indicators provides a roadmap for the actions needed to operationalize an urban SDG. The framework lays out the broad tasks needed to build the urban capacity to address sustainability goals and the metrics by which success can be first identified and measured at the appropriate level of devolution: neighbourhood, city, region or nation.

To reduce urban poverty in all its forms, end slum formation, increase productivity, and promote conditions for global sustainability, cities will need to ensure universal access to basic urban infrastructure and services: housing, water, sanitation, waste management, low-carbon energy and transportation, and information and communication technologies. Urban areas must invest in strategies to increase resilience to disasters, extreme weather events, and other threats of climate

change. Transformational technologies, such as information and communications technologies, can help improve city governance, energy and resource use efficiency, and delivery of urban services, and create new employment opportunities. Equitable and efficient urban land and resource use is essential, as is nurturing urban ecological integrity and its linkages to rural and regional systems.

To harness the potential of sustainable urbanization, city governance will have to be improved in virtually every country. Metropolitan areas and urban local governments will be at the center of decision-making and therefore need to be empowered, but they must work with many actors: e.g. national governments, local authorities, businesses, knowledge institutions, and civil society. Together these actors must mobilize the needed financial, institutional and human resources across a broad range of urban issues, such as jobs, housing, services, and infrastructure. The success of the SDGs will be determined heavily in the world's cities, resting on improvements in the quality of urban governance, sound investments, and cities' ability to innovate.

References

Angel, S., J. Parent, D.L. Civco, and A.M. Blei, *Atlas of Urban Expansion*, Lincoln Institute of Land Policy, Cambridge, MA, 2012.

Angel, S., *Planet of Cities*, Lincoln Institute of Land Policy, Cambridge, MA, 2012.

Armar-Klemesu, M., "Urban agriculture and food security, nutrition and health," In *Growing Cities*, Koschella, S. and H. de Zeeu (eds.), DSE, Feldafing, Germany, 2000.

Carr, M. and M. A. Chen, *Globalization and the Informal Economy: How Global Trade and Investment Impact on the Working Poor*, Background paper commissioned by the ILO Task Force on the Informal Economy, International Labour Office (ILO), Geneva, Switzerland, 2001.

COHRE (Center on Housing Rights and Evictions), *Global Survey of Forced Evictions*, Geneva, Switzerland, 2006.

CESCR (Committee on Economic, Social and Cultural Rights), Office of the High Commissioner for Human Rights, United Nations, *The Right to Adequate Housing*, Article 11(1), General Comment 4, 1991, Accessed from http://www.unhchr.ch/tbs/doc.nsf/0/469f4d91a9378221c12563ed0053547e.

DESA (Department of Economic and Social Affairs), United Nations, *World Urbanization Prospects, The 2011 Revision*, 2012, Accessed from http://esa.un.org/unup/.

Dobbs, R., J. Remes, J. Manyika, C. Roxburgh, S. Smit, and F. Schaer, *Urban World: Cities and the Rise of the Consuming Class*. McKinsey Global Institute, 2012, Accessed from http://www.mckinsey.com/insights/urbanization/urban_world_cities_and_the_rise_of_the_consuming_class.

Fenwick, T. B., *Avoiding Governors: The Success of Bolsa Familia*, Latin American Research Review, 44(1), 102-131, 2009.

Ferre, C., F.H.G. Ferreira, and P. Lanjouw, *Is There a Metropolitan Bias? The Inverse Relationship between Poverty and City Size in Selected Developing Countries*. Policy Research Working Paper 5508. The World Bank Development Research Group Poverty and Inequality Team, 2010.

Fletcher, J.M., T. Andreyeva, and S.H. Busch, *Assessing the effect of changes in housing costs on food insecurity*, Journal of Children and Poverty, 15(2), 79-93, 2009.

Hallegatte, S. and J. Corfee-Morlot, *Understanding climate change impacts, vulnerability and adaptation at city scale: an introduction*, Climatic Change, 104(1), 1-12, 2011.

Harvey, D., *The Right to the City*, New Left Review, 53, 23–40, 2008.

IEA (International Energy Agency), *World Energy Outlook 2008*, Vienna, 2008, accessed from http://www.worldenergyoutlook.org/media/weowebsite/2008-1994/weo2008.pdf.

IEA, *World Energy Outlook*, Vienna, 2012.

ILO (International Labour Organisation), *Men and Women in the Informal Economy*, 2002.

ITU (International Telecommunications Union), *"Turin Roadmap: Towards a Planet of Smart Sustainable Cities",* Paper from the 8th International Telecommunications Union Symposium on ICT, Environment and Climate Change, May 6-7, 2013.

Kaygusuz, K., *Energy for sustainable development: A case of developing countries*, Renewable and Sustainable Energy Reviews, 16(2), 1116-1126, 2012.

Lebevre, H., "The Right to the City," in *Writings on Cities*, E. Kofman and E. Lebas (eds), Blackwell Publishers, 1996.

Leichenko, R. and W. Solecki, *Exporting the American Dream: The Globalization of Suburban Consumption Landscapes*, Regional Studies 39(2), 241-253, 2005.

Leichenko, R. and W. Solecki, *Suburban Consumption Landscapes and Environmental Justice in Cities of the Developing World*, Society and Natural Resources, 21(7): 611-624, 2008.

Mara, D., *Sanitation: What's the Real Problem?*, IDS Bulletin, 43(2), 86-92, 2012.

Massoud, M.A., A. Tarhini, and J.A. Nasr, *Decentralized approaches to wastewater treatment and management: Applicability in developing countries*, Journal of Environmental Management, 90(1), 652-659, 2009.

McDonald, R.I., P. Green, D. Balk, B.M. Fekete, M. Balazs, C. Revenga, M. Todd, and M. Montgomery. *Urban growth, climate change, and freshwater availability*, Proceedings of the National Academy of Sciences, 108(15), 6312-6317, 2011.

McKinsey Global Institute, *Urban World: Mapping the Economic Power of Cities*, 2011.

Mendez, E., *Sustainable desalination: Membrane distillation delivers greener clean water*, Filtration + Separation, 49(5), 26-28, 2012.

Mitlin, D. and Sattherthwaithe, D., *Urban Poverty in the Global South: Scale and Nature*, Routledge, Oxford, 2013.

Murray, Christopher J. L. et al., *Global Burden of Diseases, Injuries, and Risk Factors Study*, IHME, University of Washington, 2010, Accessed from http://www.healthmetricsandevaluation.org/gbd/research/project/global-burden-diseases-injuries-and-risk-factors-study-2010

Seto, K.C., and J.M. Shepherd, *Global urban land-use trends and climate impacts*, Current Opinion in Environmental Sustainability, 1(1), 89-95, 2009.

Solecki, W. and R. Leichenko, *Urbanization and the Metropolitan Environment: Lessons from New York and Shanghai*, Environment 48(4), 8-23, 2006.

Tunstall, R., M. Bevan, J. Bradshaw, K. Croucher, S. Duffy, C. Hunter, C. Hunter, A. Jones, J. Rugg, A. Wallace and S. Wilcox, *The Links Between Housing An Poverty: An Evidence Review*, Joseph Rowntree Foundation, 2013.

UNDP, (United Nations Development Programme), *Multidimensional Poverty Index*, Human Development Reports, 2013, accessed from http://hdr.undp.org/en/statistics/mpi/.

UNHCR (United Nations High Commissioner on Refugees), *The State of The World's Refugees 2006: Human Displacement in the New Millennium*, OUP, New York, 2006.

United Nations, *The Millennium Development Goals Report*, 2007, Accessed from http://www.un.org/millenniumgoals/pdf/mdg2007.pdf

UN-Habitat, *Water and Sanitation in the World's Cities*, Earthscan, London, 2003.

UN-Habitat, *The Challenge of Slums - Global Report on Human Settlements*, Nairobi, 2003.

UN-Habitat, *State of the World's Cities 2006/7*, 2006, Accessed from http://www.unhabitat.org/documents/media_centre/sowcr2006/SOWCR%205.pdf.

UN-Habitat, *State of the Worlds Cities 2010/11*, Nairobi, 2010.

UNICEF and WHO, *Meeting the MDG Drinking Water and Sanitation Target: The Urban and Rural Challenge of the Decade*, 2006, Accessed from http://www.who.int/water_sanitation_health/monitoring/jmpfinal.pdf.

UNICEF and WHO, *Progress on Drinking Water and Sanitation, 2012 Update*, 2012, Accessed from http://www.who.int/water_sanitation_health/publications/2012/jmp_report/en/index.html.

UNISDR, *Global Assessment Report on Disaster Risk Reduction*, Geneva, 2011.

WBCSD (World Business Council for Sustainable Development), *Mobility for Development: Facts and Trends*, Geneva, Switzerland, 2007.

Weiss, M., *Teamwork: Why metropolitan economic strategy is the key to generating sustainable prosperity and quality of life for the world*, Global Urban Development, 2005, Accessed from: http://www.globalurban.org/Issue1PIMag05/Weiss%20article.htm

Wesolowski, A., and N. Eagle, *Parameterizing the Dynamics of Slums*, Paper presented at the AAAI Spring Symposium on Artificial Intelligence for Development (AI-D), 2010.

WWAP (World Water Assessment Programme), Website, 2013, Accessed at http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/

World Bank, *Global Monitoring Report 2013: Rural-Urban Dynamics and the Millennium Development Goals*, 2013, accessed from http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1327948020811/8401693-1355753354515/8980448-1366123749799/GMR_2013_Full_Report.pdf.

WHO (World Health Organization), *Global analysis and assessment of sanitation and drinking water (GLAAS)*, 2012, Accessed from http://www.who.int/water_sanitation_health/publications/glaas_report_2012/en/index.html

Zusman, E., A. Srinivasan, and S. Dhakal (Eds.), *Low Carbon Transport in Asia: Strategies for Optimizing Co-benefits*, Routledge, 2011.