

# URBAN SUSTAINABILITY

in Latin America and the Caribbean





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Inter-American Development Bank

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# Introduction

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**LATIN AMERICA AND THE CARIBBEAN** (LAC) has the highest rate of urbanization in the developing world. The proportion of the region's population living in cities almost doubled between 1950 (41%) and 2010 (80%). Likewise, economic activity in the region is significantly concentrated in its cities. Between 60% and 70% of the regional gross domestic product (GDP) is currently produced in urban areas. Despite this generation of wealth, two out of every three people in Latin American and Caribbean cities live in poverty. These circumstances, together with the growing importance of cities' impact on the environment and the high vulnerability of Latin American and Caribbean cities to climate change, natural disasters, and financial limitations, create a need for reflection on the concepts of sustainability and urban development in LAC.

Cities are more than the sum of their sectors; on the contrary, they are complex and interdependent systems on whose dynamics the quality of life of millions of people and a good part of the regional economy depend.

Environmental, economic, and social imbalances in cities can create formidable barriers to sustainable development. Understanding how cities really function is fundamental to resolving these imbalances.

In response, this work presents a comprehensive analysis of urban sustainability in Latin America and the Caribbean. The document is composed of six sections, including this introduction. Providing the theoretical and empirical elements of the analysis, the following section briefly reviews the relationship between urbanization and economic development at the international and regional levels. The third section delineates the evolution of the concept of sustainability in the urban sphere in recent years. The fourth section discusses the principal problems that currently affect the sustainability of Latin American and Caribbean cities, and the fifth section provides the foundations of a methodological proposal for approaching the comprehensive study of the sustainability of Latin American and Caribbean cities, including their components, the interactions of those components, and the horizontal and vertical integration of the analysis process. The work culminates in some final reflections in the last section.



# II

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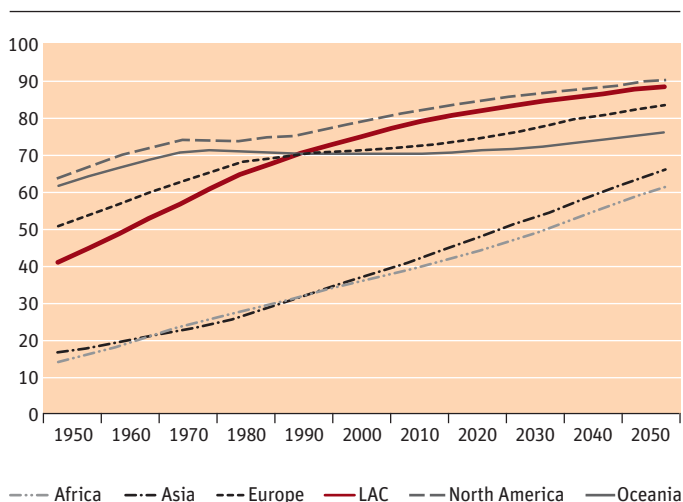
## Urbanization and Economic Development

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**WORLD URBANIZATION HAS INCREASED** significantly over the last 60 years. The percentage of the total global population living in urban areas rose from 29% in 1950 to 51% in 2010. This increase in urbanization has manifested itself with a high degree of asymmetry, however. Whereas urbanization in developed countries reached almost 75% in 2010, that in developing countries rose only to 45%. One exception among the latter group is LAC, where the average level of urbanization is close to 80%, as noted previously. According to United Nations (2008) projections, the urbanization process will intensify in coming decades; by 2050 average world urbanization will reach 69%, with the rate in LAC growing to 89% (see Figure 1).

Although within LAC, South America has the highest degree of urbanization, urban populations in Central America and the Caribbean have also grown significantly (see Figure 2), and urbanization rates in all three sub-

**FIGURE 1**  
**Percentage of Population Living in Urban Areas,**  
**by Region, 1950–2050**

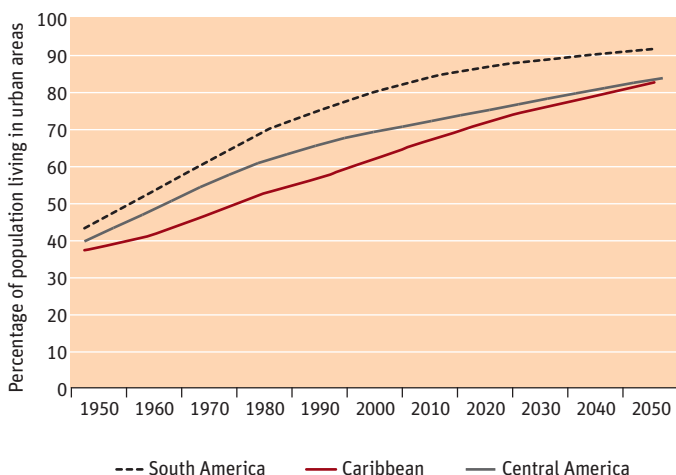


Source: United Nations (2008).

regions are expected to continue to increase through at least midcentury.

Development theories have always given special attention to urbanization. They postulate that industrialization brings with it a productivity gap between urban and rural labor that is reflected in a salary differential between the two areas, driving rural-urban migration. This phenomenon is reinforced by a fall in the demand for agricultural products in favor of those from the industrial and service sectors. At the same time, indicators of well-being are higher for urban residents than for their rural counterparts, as city dwellers enjoy greater coverage of

**FIGURE 2**  
**Urbanization in Latin America and the Caribbean,  
by Subregion, 1950–2050**



Source: United Nations (2008).

public services and higher incomes. These forces of economic development impel migration from the country to the city, resulting in the levels of urbanization observed in recent decades.

However, this theory does not necessarily reflect the pattern of development in Latin American and Caribbean countries or explain why they have experienced substantially higher levels of urbanization than other regions of the world. Likewise, the growth of the urban population in LAC is not necessarily reflected in a better quality of life for the region's urban inhabitants. Although as noted previously, the region has one of the highest degrees of

urbanization in the world, its average per capita income has remained below that observed in developed countries.

This paradox of urbanization and poverty is explained, in part, by the exodus of the region's rural population, resulting from a high concentration of property, low rural productivity, lack of urban regulations and the proliferation of informal settlements, centralization, and the consolidation of island countries in the Caribbean. In this sense, the “excess of urbanization” is in large part due to the disproportionate growth of the region's large metropolises that has resulted from these factors.

The rapidity of urbanization in LAC has led to important deficits in urban infrastructure in the region. According to UN-HABITAT (2008), 117 million people in LAC—27% of the region's urban population—live in informal urban settlements. This situation produces striking contrasts in the quality of life within cities, where developed areas coexist with areas of extreme poverty that lack services and infrastructure and have poor living and environmental conditions.<sup>1</sup>

According to the Economic Commission for Latin America and the Caribbean (ECLAC) (2010a), Latin American cities have high concentrations of poverty.

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<sup>1</sup> Ruprah (2009) finds that the region's qualitative housing deficit shows up most prominently in the areas of access to sanitary services, composition of floors (i.e., dirt floors versus others), and tenancy issues.

ECLAC estimates that in 2008, 33% of the region's population lived in poverty (180 million people), and of these, approximately 66% (118 million people) lived in urban areas. Despite this austere social reality, cities in the region have significant economic importance, generating approximately 70% of the region's GDP.<sup>2</sup>

The urbanization process in Latin America and the Caribbean has taken place in three stages. The first involved urban growth in countries of the Southern Cone at the beginning of the twentieth century, as a result of an initial period of prosperity and export-oriented growth (Polèse, 2009). The second consisted of increasing urbanization in the second half of the twentieth century, generated in part by import substitution strategies in the region. Deconcentration from large cities to intermediate-sized cities, the third stage, has been taking place over the last two decades.<sup>3</sup>

Urbanization leads to a greater demand for the activities of the state, which consequently requires more resources to finance them. As Wagner's Law postulates, the urbanization that accompanies economic growth produces more complex social and spatial resources, which require the intervention of the state as a regulator, coordinator,

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<sup>2</sup> Here, urban GDP has been estimated by subtracting primary sector activities (agriculture and mining) from total GDP.

<sup>3</sup> Cristini et al. (2008), Pinto da Cunha (2002), Krugman and Elizondo (1996), and Portes and Roberts (2004) present evidence of this.

and provider of services. Increased state intervention occurs principally through two channels.<sup>4</sup> First, increases in the urban population result in more-developed societies with a greater number of conflicts among their members, which the state takes on a critical role in resolving. Second, as public spending tends to increase at a higher rate than income, economic development requires greater state expenditure to satisfy the demand for goods and services that urbanization brings.

In synthesis, LAC's population and economic activity are concentrated in its cities, which determine the quality of life for the Latin American and Caribbean citizen to a greater extent than would be expected given the level of development of the region's countries. Achieving higher goals in development—such as the Millennium Development Goals—in the region will therefore require extensive work in regard to its cities, including their governability.

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<sup>4</sup> For more detail on Wagner's Law, see Bird (1971).

# III

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## Sustainability of Urban Development

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THE HIGH DEGREE OF WORLDWIDE urbanization has led to concern among governments about its social and economic impact, as well as its environmental consequences. It is important to achieve growth that improves current living conditions without compromising those of future generations. Because cities concentrate a high percentage of the population and economic activity, urban sustainability is fundamental to achieving a pattern of development that takes into account the needs of both present and future generations.

The concept of sustainability has its origins in the preservation of nature, an idea that dominated until the end of the twentieth century.<sup>5</sup> The environment was associated with rural and wild nature, which needed to be protected from urban advance and cultural changes. According to

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<sup>5</sup> The concepts expressed in this section are based on Shmelev and Shmeleva (2009).

this approach, the environmental dynamic was seen as external to cities, and efforts were directed at integrating the environmental variable into general urban design and the management of the problems that occasioned the introduction of massive water supply and sewer systems, the creation of parks and recreation zones, or traditional land use planning.

According to Shmelev and Shmeleva (2009), the concept of sustainable development was introduced in a 1987 report by the World Commission on Environment and Development. In that report, sustainable development was understood as a process of harmonious economic development capable of satisfying principles of social justice and environmental responsibility. To achieve this, a commitment to balancing economic, environmental, and social goals between present and future generations was deemed necessary. Despite these advances, it was not until 1992, during a conference of experts in Rio de Janeiro, that cities were recognized as an important area for the application of the sustainable development concept.

Over the last decade, conferences have been organized and conducted to promote activities that will improve the quality of urban life around the world. A new concept of sustainability has emerged that involves urban components that go beyond the environmental to include cultural, political, social, institutional, and economic variables. This new vision of sustainability requires the development of methodologies that study cities holistically as complex systems of multiple sectors. Thus, the



interdisciplinary paradigm provides a qualitative and quantitative understanding of the problems of urban management and development.

A review of the current literature on urban sustainability reveals proposals for empirical applications that attempt a more all-encompassing approach. Many come from the analysis of problems in particular sectors and their impact on the other components of the urban system.<sup>6</sup> On the other hand, another series of works takes a more holistic approach to urban analysis.<sup>7</sup>

In synthesis, the new vision of the sustainable city characterizes urban development as a holistic system in which social, economic, environmental, and institutional elements are integrally harmonized. It is based on the concept that a city is composed of interrelated, interdependent sub-systems. For example, a sustainable public transportation system would improve quality of life and public health by reducing energy requirements, travel time, and emissions. Similarly, the construction and maintenance of a public transportation system is dependent upon the availability

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<sup>6</sup> Some of the principal areas analyzed are energy (Capello, Nijkamp, and Pepping, 1999; Boyle, 2004), sustainable transportation (Banister, 2005), economic activity and planning (Banister, Button, and Nijkamp, 1999), cities in the context of globalization (Eade and Mele, 2002; Hall and Pfeiffer, 2004), and green spaces (Rees, 2002; Clark, 2006).

<sup>7</sup> A holistic approach can be found in Ravetz (2000), Shane and Graedel (2000), Button (2002), Wiek and Binder (2005), and Salat and Nowacki (2010).

and management of local resources, which is determined by a city's fiscal sustainability. The analysis and design of sustainable urban development strategies require a comprehensive assessment that links the different aspects of urban life. Although studies in the field recognize a holistic approach in the definition of potential indicators and the establishment of intersectoral ties, there is as yet no applied tool that allows for a holistic analysis and sectoral prioritization.

# IV

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## Urban Challenges in LAC

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**THE ACCELERATION OF URBAN GROWTH** in LAC creates a series of challenges that the region's cities must face to ensure sustainability in coming years. These challenges can be grouped into three dimensions: (i) disaster risk and climate change, (ii) comprehensive urban development, and (iii) fiscal management, governability, and transparency. In the vast majority of cases, these areas are interrelated, and the decisions made in each affect the others. Thus, it is difficult to establish a channel of transmission between these areas that runs in only one direction.

### **Disaster Risk and Climate Change**

Because of the characteristics of urban development in LAC, two major areas of intervention are possible in regard to urban sustainability: (i) the management of disaster risk and vulnerability to climate change, and (ii) the reduction of greenhouse gas emissions.

## *Disaster Risk and Vulnerability to Climate Change*

Many Latin American and Caribbean countries will experience growth in their urban populations in coming years, which may increase their vulnerability as a result of inadequate urban planning and the abuse of natural resources. Only by incorporating natural disaster prevention and risk mitigation criteria into urban planning and taking into account the root causes of vulnerability will a true, balanced urbanization process that contributes to sustainable development and does not increase the population's vulnerability be possible.

Disasters triggered by natural phenomena are having progressively more devastating effects from the perspective of social and economic development in the majority of Latin American and Caribbean countries. From 1970 to 2008, natural disasters in the region affected approximately 4.5 million people each year, resulting in an average of 6,800 deaths annually and US\$120 billion in material damage over the period (CRED, 2010). Of this damage, US\$100 billion was generated by hydrometeorological events (floods, droughts, landslides caused by rain, etc.) and the remaining US\$20 billion was the result of geophysical events (earthquakes, tsunamis, volcanic eruptions, etc.).

Global climate change will continue to transform temperature, precipitation, and wind variables, which may lead to greater variability in the intensity and frequency of hydrometeorological events, a rise in the level of the

oceans, variations in water availability, an increase in the frequency and intensity of floods, a reduction in crop productivity, and an increase in the incidence of vector-borne diseases. In many cases, climate change will increase pressure on vulnerable populations, who have a lower capacity to adapt to these changes.

In cities with inadequate infrastructure or those constructed in hazardous areas, intense rains and tropical storms often result in flooding and landslides. Flooding risk arises not only from intense or prolonged rains, but also from increases in the level of the sea and changes in the flow of rivers, caused, for example, by climate-change-driven glacial melting (Satterthwaite et al., 2007). If preventative action is not taken to mitigate the risk of extreme events in the coming decades, costs associated with these events could amount to US\$250 billion by the year 2100 (Samaniego, 2009).

In addition, new threats may emerge from climate change, such as those related to increases in sea level, which would put coastal infrastructure at risk. Half of the Latin American cities with populations over five million are located in low-elevation coastal zones.<sup>8</sup> Furthermore, rises in the sea level would imply salinization of coastal aquifers, which would negatively affect the quality of

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<sup>8</sup> According to Dasgupta et al. (2007), a one-meter rise in sea level would cause damage in LAC amounting to approximately 0.54% of the regional GDP, and damage from a three-meter rise would reach 1.35%.

subterranean water. On the other hand, cities located at high altitudes are vulnerable to changes in the availability of water, caused, for example, by the deterioration of highland moors.

### *Greenhouse Gas Emissions in Cities*

Urban centers are responsible for the vast majority of greenhouse gas emissions, owing to the use of fossil fuels,<sup>9</sup> both direct (principally in industry and urban transportation) and indirect (in the production of electricity and transport of goods). On the other hand, the greenhouse gas emissions produced by waste and industrial processes are also closely linked with the urban environment.

In LAC, the transportation sector contributes 35% of the emissions connected to the use of combustibles, which is the highest proportion for this sector of any region in the world. High rates of motorization, rapid urbanization, slow upgrading of the vehicle fleet, and relatively low standards in combustibles markets have led to a greater increase in carbon dioxide emissions from transportation in LAC over the last decade than from any other sector. Road transportation is responsible for 92% of the total greenhouse gas emissions in the transportation sector in

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<sup>9</sup> Fossil fuel use in LAC was responsible for 1.48 million tons of carbon dioxide emissions in 2008, of which 35% came from transportation, 34% from industry, 10% from the energy sector's own consumption, 11% from the residential sector, and the remaining 10% from other sectors (IEA, 2010).

the region, with passenger traffic and transport of goods contributing about equally to the total.

The water and waste sector also occupies a predominant place in urban emissions of greenhouse gases, principally because of the methane produced by solid and liquid waste and the use of energy in the sector. In particular, the emission of methane gas in landfills is increasing rapidly in the region as the result of a greater generation of waste stemming from increased income and a lack of regulations regarding the treatment of waste.

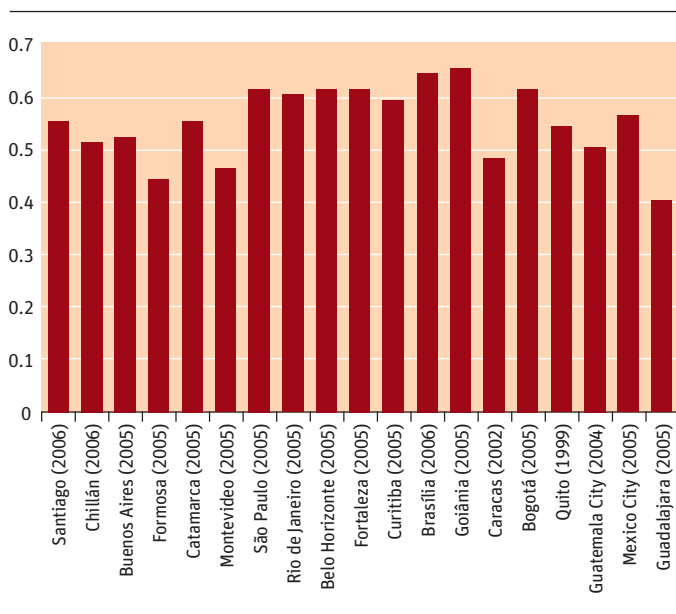
## **Comprehensive Urban Development**

To formulate a holistic vision of urban development in LAC, it is necessary to consider the traits that characterize the region's cities. This subsection discusses urban characteristics that point to priorities for achieving sustainability in urban development in the medium and long term.

### ***Inequality, Informality, Unemployment, and Competitiveness***

LAC is the region with the greatest inequality in the world, and its cities are no exception to this phenomenon. Urban inequality in Latin America and the Caribbean is greater than that found in some developing nations in Asia and Africa. Despite positive growth in GDP in recent years, decreases in urban inequality were not of the same magnitude, and in some cases urban inequality actually increased.

**FIGURE 3**  
**Gini Coefficients for a Selection of Latin American  
 and Caribbean Cities**



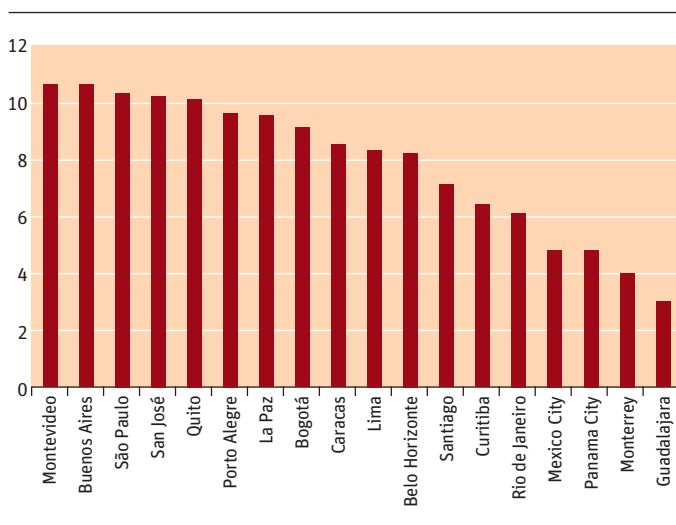
Source: UN-HABITAT (2008).

A number of Latin American cities have Gini coefficients above 0.6, a value considered high by international standards. Figure 3 shows that this group includes São Paulo, Rio de Janeiro, Belo Horizonte, Fortaleza, Brasília, Goiânia, and Bogotá.

Inequalities in urban income are explained in part by the inability of the economy to generate enough jobs to absorb the region's growing urban populations, which has resulted in elevated rates of unemployment and informality in the region. Figure 4 indicates that despite



**FIGURE 4**  
**Unemployment Rates in Selected**  
**Latin American Cities, 2007**  
(percent)



Source: UN-HABITAT (2010).

good economic performance in Latin America and the Caribbean in the early 2000s, in 2007 unemployment rates remained high in São Paulo (10.3%), Buenos Aires (10.6%), Bogotá (9.1%), San José (10.2%), Porto Alegre (9.6%), Montevideo (10.6%), Quito (10.1%), and La Paz (9.5%).

Employment in LAC is characterized by high levels of informality. Perry et al. (2007) estimate that 57% of employment in the region's urban areas is informal. They point out that informal workers fall into two categories, with considerable differences between countries in the distribution of

workers who fall into each category: independent informal workers, who account for 24% of total urban employment, and informal workers who receive wages, who account for 33% of total urban employment and more than half of all informal work. The design of appropriate urban sustainability strategies for the region must take these labor market conditions into consideration.

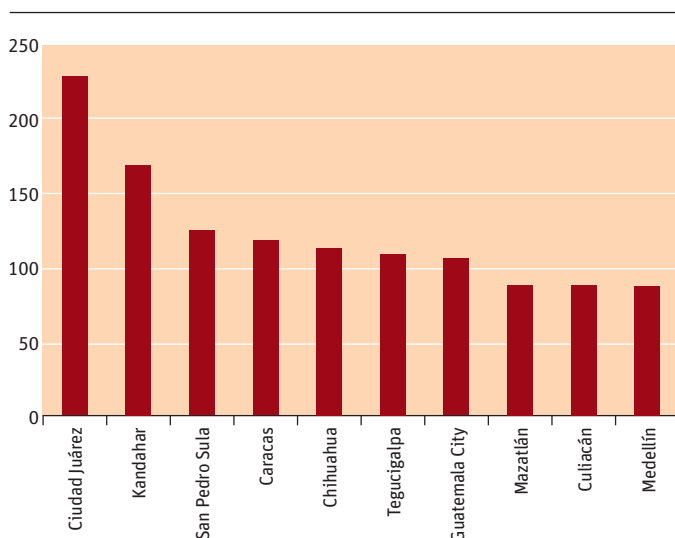
In addition, the impact of job creation and increases in the productivity of small and medium-sized companies located in cities is beginning to be considered one of the key aspects of urban development. The traditional factors taken into account when the competitiveness of a city is analyzed include infrastructure and communications, natural resources, human capital, quality of life, and the sophistication of the local management.

### ***Public Safety***

LAC has some of the highest crime rates in the world. After southern and western Africa, LAC has the world's highest homicide rate, triple that of the world average in 2007. The problem is not homogenous across LAC; there is high variability among the region's countries. The homicide rates of El Salvador, Jamaica, and Honduras are the highest, and those of Chile, Uruguay, and Argentina are significantly below the average.

Cities in LAC account for a large percentage in regional crime rates. According to a 2010 ranking published by a Mexican civil society organization, Consejo Ciudadano

**FIGURE 5**  
**Homicides in the 10 Cities with the**  
**Highest Rates in the World**  
(per 100,000 residents)



Source: Consejo Ciudadano para la Seguridad Pública y la Justicia Penal A.C. (2011).

para la Seguridad Pública y la Justicia Penal, nine of the ten cities with the highest murder rates in the world are Latin American: Ciudad Juárez, San Pedro Sula, Caracas, Chihuahua, Tegucigalpa, Guatemala City, Mazatlán, Culiacán, and Medellín, along with the city of Kandahar in Afghanistan (see Figure 5).

High levels of crime threaten the well-being of citizens, especially the poorest. Violence is an obstacle to development in multiple ways: it elevates economic costs to both individuals and companies, inhibits the possibility

of a propitious climate for business and the peaceful co-existence of a democratic society, destroys virtuous social capital, fosters parallel economies of organized crime, and erodes trust in institutions, especially those charged with protecting human rights and obligations of individuals. All of these factors diminish competitiveness in Latin American and Caribbean cities and increase their social vulnerability.

Public safety is currently one of the most influential factors in regard to quality of life and sustainability in Latin American and Caribbean cities. Surveys from 15 countries in the region indicate that 40% of residents in its principal cities have been the victim of a crime in the preceding 12 months. This is an important challenge for LAC; according to Latinobarometer surveys, citizens consider public safety to be the most important problem in the region. The perception of a lack of public safety among the region's inhabitants<sup>10</sup> has a negative impact on the environment for investment and business.

### ***Water, Sanitation, and Waste Management***

Despite improvements in potable water, sewer, and electricity coverage in the region, there are still portions of the urban population without connections to some services.

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<sup>10</sup> This lack of security is considered the most important problem in the region, according to various regional surveys: those by Latinobarometer, the Latin American School of Social Sciences (FLACSO), and the Latin American Public Opinion Project (LAPOP).

The differences in coverage between the two highest income quintiles and the two lowest income quintiles reflect the high degree of population segmentation that exists in the cities of the region. The most critical case is that of water and sanitation, in which the average regional difference in coverage between quintiles is 17.8%. The difference surpasses 30% in Argentina, Brazil, El Salvador, Honduras, Mexico, Peru, and Uruguay (Cristini et al., 2008).

In many cases, there are frequent interruptions in service or insufficient water pressure, or the water that actually arrives at the user's home is not potable. The poor quality of service and inappropriate pricing structures mean that large industrial users use up alternative water supply sources, negatively affecting water tables.

In sanitation, the situation is more precarious, and 10 Latin American and Caribbean countries have coverage levels below 50%. The lack of coverage is naturally concentrated in low-income areas, with a difference of nearly 18 percentage points between the lowest two income quintiles and the highest two quintiles. Families with the lowest incomes must attend to their needs through the use of latrines, cesspits, and similar substitutes with poor sanitation. The sanitation situation has a very significant impact on the environment, as only 15% of sewage in the region's cities receives any kind of treatment before it reaches bodies of water. This waste becomes the principal source of organic contamination in rivers, lakes, aquifers, and tidal areas.

Utilities in LAC are most often provided by state companies with serious financial and management difficulties that impede their ability to provide adequate and cost-efficient services. In most of the region's large cities, over 50% of the water produced does not reach paying customers. On the other hand, there are innumerable cases of water squandering, a product of poor management of demand, including a variety of issues ranging from a lack of measuring devices to inadequate pricing and payment structures.

The principal limitation of waste management in LAC is inadequate final disposal; as Table 1 shows, only 55% of the region's waste receives adequate final disposal in landfills. The rest is disposed of in uncontrolled open-air dumps or bodies of water. Inadequate final garbage disposal practices have many negative environmental effects, and these externalities are rarely taken into account at the time that decisions are made regarding investments in infrastructure for proper waste disposal. The region's economic and population growth is pushing the final disposal system to the brink of collapse in several of the region's capitals where there is not enough space available to expand and construct landfills. The treatment and disposal of this incremental waste will be an immense challenge for the region in coming decades.<sup>11</sup>

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<sup>11</sup> The regional average waste generation is currently 0.63 kilograms per inhabitant per year; in developed countries, averages have stabilized at twice this amount.

**TABLE 1** Production of Waste per Capita, Percentage of Collection, and Methods of Disposal in LAC, 2010

Country	2010 per capita generation of waste (kg/inhabitant/day)		Percentage of collection service	Percentage of urban solid waste	
	Domestic	Urban		Landfill	Unregulated form <sup>b</sup>
Argentina	0.77	1.15	99.8	64.7	35.3
Belize	—	2.82	85.2	—	—
Bolivia	0.46	0.49	93.3	44.7	55.3
Brazil	0.67	0.94	95.4	53.9	46.1
Chile	0.79	1.25	—	81.5	18.5
Colombia	0.54	0.62	98.9	81.8	18.2
Costa Rica	—	0.88	90.4	67.5	32.5
Ecuador	0.62	0.71	84.2	30.2	69.8
El Salvador	0.50	0.89	78.8	78.2	21.8
Guatemala	0.62	1.12	77.7	15.4	84.6
Honduras	0.61	—	64.6	11.3	88.7

*(continued on next page)*

**TABLE 1** Production of Waste per Capita, Percentage of Collection, and Methods of Disposal in LAC, 2010  
(continued)

Country	2010 per capita generation of waste (kg/inhabitant/day)		Percentage of collection service coverage <sup>a</sup>	Percentage of urban solid waste	
	Domestic	Urban		Landfill	Unregulated form <sup>b</sup>
Mexico	0.58	0.94	93.2	65.6	34.4
Panama	0.55	1.22	84.9	41.7	58.3
Paraguay	0.69	0.94	57.0	36.4	63.6
Peru	0.47	0.75	84.0	43.5	56.5
Uruguay	0.75	1.03	98.0	3.8	96.2
Venezuela	0.65	0.86	100.0	12.9	87.1
<b>Average for Latin America</b>	<b>0.63</b>	<b>0.91</b>	<b>86.0</b>	<b>55.2</b>	<b>44.8</b>

Source: PAHO (2010).

<sup>a</sup> Percentage of waste collection service by population size.

<sup>b</sup> Includes controlled and open-air dumps, open-air burning, bodies of water, and food for animals.



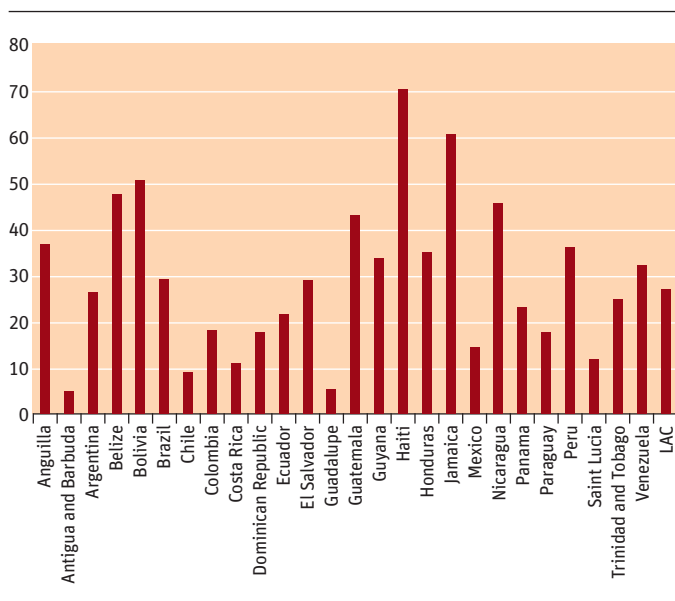
The other major urban environmental problem related to this issue is the disposal of industrial waste into bodies of water. Principal rivers have reached extreme levels of contamination in multiple Latin American and Caribbean cities, definitively restricting use of the rivers and leaving them lifeless.

### *Urban Planning*

The rapid and inefficient growth of Latin American and Caribbean cities over the last few decades has significantly affected their physical environments. The lack of planning and/or inadequate enforcement of existing regulations has led to disorderly and irrational land use patterns, which contribute to congestion and excessive travel time within cities. Cities' footprints continue to expand rapidly, consuming natural resources and invading agricultural areas and those protected for environmental or safety reasons. Uncontrolled occupation of land exposed to environmental risks increases the damage caused by natural disasters. It amplifies the impact of floods, hurricanes, and earthquakes, which tend to affect the poorest population most severely.

One reflection of the urban planning problems in LAC is the proliferation of informal neighborhoods in the region's cities. As mentioned previously, approximately 27% of the region's urban population lives in informal settlements. This indicator, as Figure 6 shows, is highly variable from country to country. Brazil and Mexico, which together account for 54% of LAC's urban population,

**FIGURE 6**  
**Urban Population Living in Informal Settlements in LAC**  
 (percentage)



Source: UN-HABITAT (2008).

are home to 48% of the region's residents who live in informal settlements: 45 million in Brazil and 12 million in Mexico.

Portions of the population who live in informal areas are more vulnerable to health risks and natural disasters associated with poor environmental and sanitation conditions. Accordingly, city planning is a fundamental instrument for the development of harmonious cities with efficient land use that contribute to the quality of life of their populations, discipline their activities, and

facilitate home-work commutes. City planning should go beyond a simple technical exercise to become one that involves a city's tangible and intangible assets. This process should respond to growing inequality and segmentation and consider the metropolitan expansion or consolidation that has characterized recent urban development (UN-HABITAT, 2008).

### ***Transportation Systems***

Transportation is a fundamental component of city sustainability. In Latin America and the Caribbean, the demand for urban transportation is very high, often surpassing the capacity of the existing infrastructure. In some urban areas in the region, the transportation infrastructure is underdeveloped, and it is necessary to plan for its expansion. On the other hand, however, increasing the capacity of this infrastructure often comes at a high cost to society in highly consolidated urban environments.

Rapid growth in the ownership and use of private vehicles (motorization) is a direct cause of the congestion, pollution, and high number of traffic accidents in Latin American and Caribbean cities. The motorization phenomenon is explained by a combination of factors that include increases in GDP per capita, decreases in automobile prices, greater access to credit, development patterns in suburban areas, and highly subsidized fuel prices. If current trends continue, by 2030 the region will probably reach the levels of motorization found in Europe in

the 1960s, but with many more metropolitan areas of more than five million inhabitants than Europe had at that time or has currently (Schipper et al., 2009).

Not only does congestion have negative effects on cities' economic viability, but it is socially inequitable, as it disproportionately affects the poor, who tend to live far from their places of work and experience even greater delays in their commutes. Although the increasing motorization in LAC is mainly due to new private automobiles acquired by the segments of the population with the highest income, the congestion most drastically affects public transportation users, who share the same infrastructure as those using individual modes of transportation.

In association with motorization and congestion, environmental contamination and road safety problems emerge. The increase in traffic has elevated the number of traffic accidents in the world to such a level that the World Health Organization (2009) has classified them as a global epidemic. Latin American and Caribbean cities are not exceptions to this phenomenon, and they have higher accident rates than those observed in cities in member countries of the Organization for Economic Cooperation and Development.

The urban transportation problem is also related to the condition of the existing infrastructure. The Andean Development Corporation's Urban Mobility Observatory concludes that although the majority of road offerings in

the region's metropolitan areas may be considered ample, their quality is poor. In most cases, this is explained by the high costs of maintenance in the face of existing budget limitations. A comparison with other regions in the world reveals that average mobility in metropolitan areas in LAC is significantly lower than that in cities in developed countries (CAF, 2010).<sup>12</sup>

## ***Energy***

The Latin American Energy Organization (OLADE) (2010) reports that at least 38 million people in LAC lack access to electricity; of these, 73% are poor. Whereas some of the region's countries have electricity coverage greater than 99%, other countries must make an effort to provide both urban and rural populations with access (ECLAC, 2010b). This is the case for countries like Bolivia, Haiti, and Nicaragua, which have coverage rates of 69%, 34%, and 63%, respectively. Particular attention should be given to the populations on the edges of cities so that they can have sustainable electricity service.

In terms of the environment, one of the most visible effects related to energy consumption in cities is the negative externalities of mass consumption of fossil fuels for

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<sup>12</sup> The mobility index employed for this comparison (number of trips per inhabitant per day) is directly related not only to the level of economic activity, but also to the quality, efficiency, safety, and accessibility of the transportation system (infrastructure and services) that permits the development of economic activities.

the generation of electricity.<sup>13</sup> Other direct effects are related to the layout of the infrastructure for providing energy services to the interior of cities. Consumption of low-quality combustibles both outside<sup>14</sup> and inside<sup>15</sup> of homes also has an important impact in city environments. Finally, the overexploitation of local natural resources to satisfy energy needs has undesirable effects on the surroundings.<sup>16</sup>

Not only is energy necessary to ensure the quality of life of urban populations, but it is also a factor of production in the economy. Because of this, energy efficiency is of fundamental importance to reducing households', businesses', and industry's monthly expenditure on electricity and fuel and, at the same time, reducing greenhouse gas emissions when energy is produced using fossil fuels. Studies financed by the Inter-American Development Bank (IDB) show that with a low level of investment, it is possible to obtain energy savings on the order of 15–20% in LAC, especially in lighting and refrigeration costs.

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<sup>13</sup> Through the burning of fossil fuels, the energy sector contributes to the emission of greenhouse gases and nitrogen oxides, sulfur oxides, volatile organic compounds, and breathable particulate matter (that less than 10 microns in diameter), depending on the quality of the fuel.

<sup>14</sup> Combustion of biomass for heating and the resulting poor air quality in cities in the south of Chile is a good example.

<sup>15</sup> Families with limited resources tend to use heating or cooking systems (e.g., firewood or kerosene) that contribute to air pollution.

<sup>16</sup> An example of this is Haiti, where the high rate of deforestation is due, in part, to the indiscriminate use of firewood for energy purposes.

Other measures to contribute to energy sustainability include the use of renewable energy sources, such as photovoltaic solar panels and mini-wind turbines for distributed production. To the extent that renewable energy systems are economically viable, they reduce dependency on fossil fuels. In this way, homes, businesses, and industry can become self-sustaining and eventually sell any excess energy they produce back to the grid.<sup>17</sup>

Planning is key in the definition of a city's energy demand and supply. City building codes determine aspects such as the height of buildings and the amount of shadow permissible, which affect buildings' energy demands. City planning can also define the amount of green space, a tool for mitigating the effects of cities, such as urban heat islands.<sup>18</sup>

## **Fiscal Management, Governability, and Transparency**

Latin American and Caribbean cities are faced with the challenge of generating the resources and developing the institutions necessary to satisfy their citizens' demand for public goods. In the last two decades, decentralization processes in the region have transferred power

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<sup>17</sup> Achieving this objective requires energy legislation that permits the sale and purchase of small-product energy to the grid. Such legislation already exists in Barbados and Mexicali (Mexico).

<sup>18</sup> Urban heat islands increase the heat curve over time, which affects the demand for refrigeration.

from central to local governments. Thus, urban sustainability is tightly linked to consolidation of local governments' fiscal situation and the strengthening of their institutions.

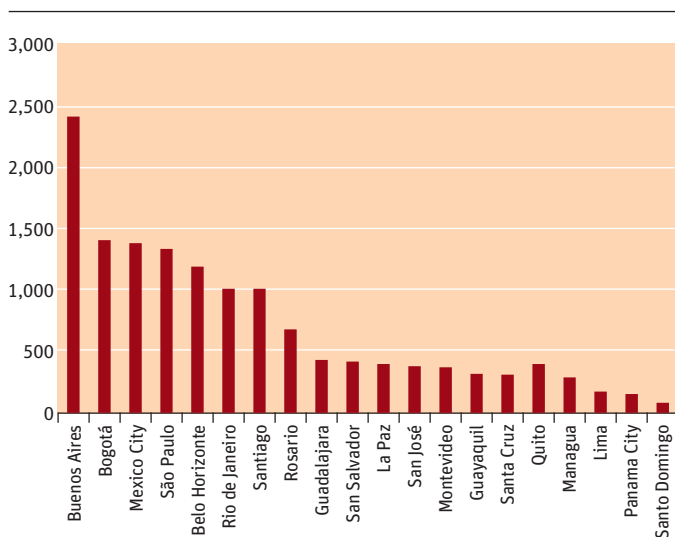
### *Fiscal Management*

The fiscal state of city governments is an essential factor in urban quality of life. In the majority of countries in Latin America and the Caribbean, municipal governments are in charge of providing most local services. However, most municipalities are dependent on transfers from national governments; they do not adequately exploit their own sources of revenue and consequently lack resources for investment. Local governments in Latin America and the Caribbean rely on federal government transfers to cover 59% of their budgets, on average, though this value varies according to the number and degree of transferred functions and institutional arrangements.

There are profound asymmetries in the managerial capacity of local governments throughout the region. On the one hand, there are great metropolises that are relatively developed institutionally, and on the other hand, there are small and intermediate-sized cities with poor performance. In the vast majority of cases, urban tax bases in the region are weak and underexploited, which limits governments' abilities to generate the resources necessary to attend adequately to the new challenges of urbanization and climate change on their own. In a survey of Latin American cities, Cristini et al. (2008) found a wide



**FIGURE 7**  
**Annual Revenue per Resident in Selected**  
**Latin American Cities, 2006**  
 (U.S. dollars at purchasing power parity)

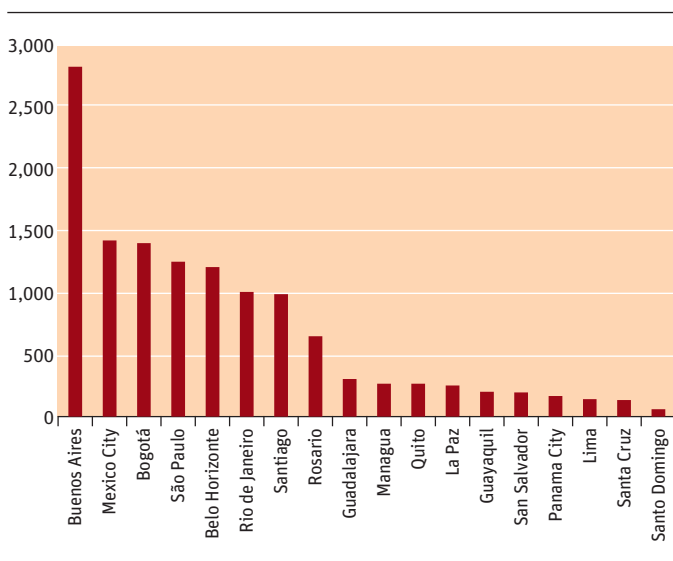


Source: Cristini et al. (2008).

disparity in total fiscal income per capita (see Figure 7). Municipal governments' low revenue levels make them excessively dependent on transfers from federal governments (vertical imbalances). There are also sizable differences in revenue between cities with a large economic base and those without one (horizontal imbalances).

Upon analyzing expenditure data for their sample of cities in the region, Cristini et al. (2008) detected high heterogeneity in the sample. Figure 8 shows that Buenos Aires, Mexico City, and Bogotá have the highest expenditure

**FIGURE 8**  
**Annual Expenditure per Resident in Selected**  
**Latin American Cities, 2006**  
 (U.S. dollars at purchasing power parity)

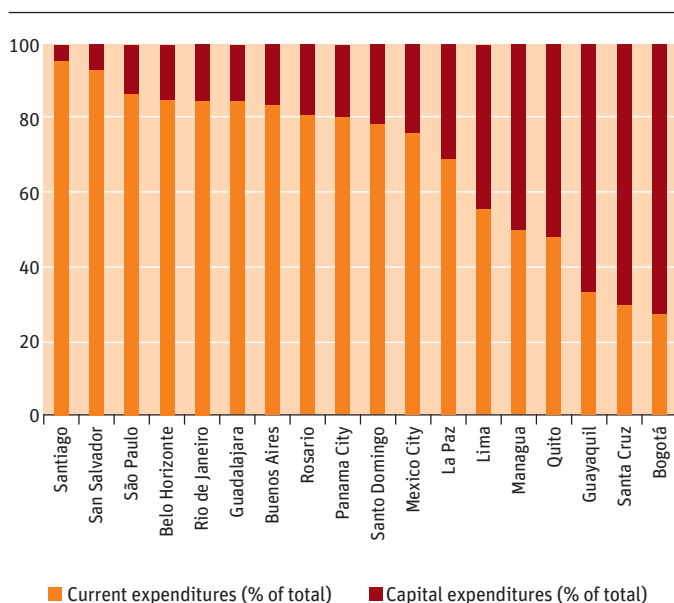


Source: Cristini et al. (2008).

per resident, whereas Panama City, Lima, Santa Cruz, and Santo Domingo have the lowest.

When the composition of expenditures in the sample cities is reviewed, another interesting pattern becomes apparent. In countries with a centralist tradition, such as Chile and El Salvador, city expenditures consist almost entirely of current expenses. In the Brazilian and Argentinean cities, as well as in Panama City, Santo Domingo, and Mexico City, current expenses make up around 80% of the total. The greatest proportion of

**FIGURE 9**  
**Composition of Expenditure in Selected**  
**Latin American Cities, 2006**  
 (percentage of total expenditure)



Source: Cristini et al. (2008).

capital expenditure is found in Guayaquil, Santa Cruz, and Bogotá (see Figure 9).

### ***Governability and Transparency***

Local governments in LAC suffer in varying degrees from a number of management problems, including the shortcomings of their internal financial and administrative systems, the absence of effective controls over public services,

and limited planning capacities. Moreover, in metropolitan agglomerations, the absence of governability mechanisms is an obstacle to the implementation of regional planning policies, the application of regulatory functions, and the provision of important services of common interest for urban and environmental sustainability.

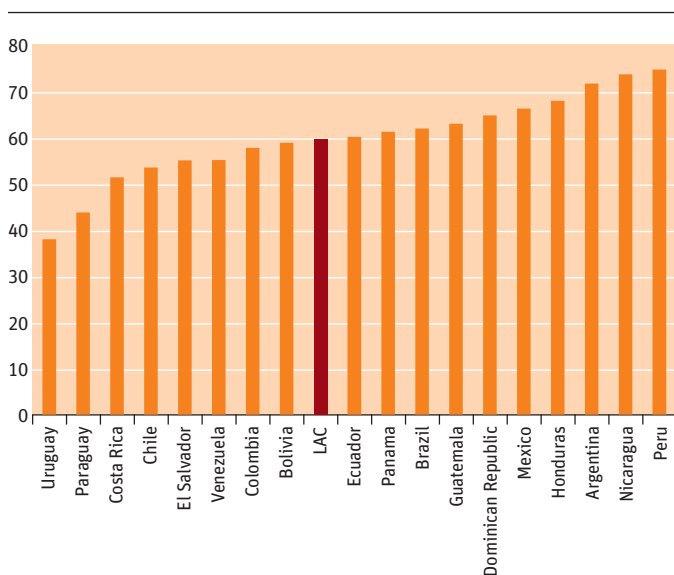
Poor governance is reflected in a widespread perception of corruption in the region. For example, the corruption index estimated by Transparency International shows an average level of corruption in LAC (3.9) much greater than that estimated for countries like Sweden (9.2), Japan (7.7), Germany (8.0), and the United States (7.5).<sup>19</sup>

When the analysis focuses on local government, Latin American and Caribbean citizens are found to have little confidence in these administrations as well. According to Latinobarometer data, 60% of those surveyed in countries throughout the region in 2009 said they had little or no confidence in their local authorities. As shown in Figure 10, distrust in local governments in Ecuador, Panama, Brazil, Guatemala, the Dominican Republic, Mexico, Honduras, Argentina, Peru, and Nicaragua is greater than the regional average. Distrust in local authorities is lower in Chile, Costa Rica, Paraguay, and Uruguay, among other countries, although even there, the levels border on 50%.

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<sup>19</sup> Transparency International's corruption index ranges from 0 to 10, with lower values indicating a greater perception of corruption.

**FIGURE 10**  
**Citizens with Little or No Confidence in Local**  
**Government in Selected Latin American**  
**and Caribbean Countries, 2009**  
 (percentage)



Source: Latinobarometer.

In summary, certain characteristics of Latin American and Caribbean cities differentiate them from cities in other regions: environmental problems that have made their residents highly vulnerable to natural disasters; urban development characterized by informal settlements and labor segmentation in access to basic services, unemployment, and crime; and local governance characterized by vertical fiscal imbalances and limited institutional capacity.





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## Toward a Concept of Urban Sustainability Applicable to LAC

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AS OBSERVED, LAC HAS A high degree of urbanization and great challenges in its urban areas. These characteristics determine its process of development and require a strategy of economic and social development capable of reconciling the interests of present and future generations. One of the restrictions that confront the study of urban sustainability is the complex and dynamic nature of cities. Establishing different paths of interdependence and transmission between sectors within a city becomes key to the design of sustainable local public policies.

This section presents, through the experience of and work produced by the IDB, the elements that should be part of an analysis of urban sustainability in LAC. First, a brief assessment of the different sectoral analyses that the Bank has carried out is presented, highlighting the lessons learned from them. Later, the elements to be

considered in the development of a methodology to identify priority actions to strengthen urban sustainability in LAC are described. Finally, the arguments for focusing urban sustainability action on intermediate-sized cities are outlined.

## **The Experience of the IDB**

The Bank has a long tradition of sectoral projects in a large group of Latin American and Caribbean cities. It has supported various projects through loans for investment or technical cooperation, in sectors such as transportation, water and sanitation, housing and urban development, state modernization, and fiscal, financial, and expenditure management. It has provided support to cities using a comprehensive approach, through renovation of historic downtown areas, neighborhood improvement, social housing, and sustainable mass transit, among other initiatives. In the last two decades, the IDB has disbursed a total of approximately US\$7.0 billion for projects centered on cities. The projects have been directed toward a variety of sectoral actions, from decontamination of water sources to strengthening public safety (see Table 2).

Since the middle of the last decade, the Bank has established initiatives that reflect a more integrated vision of city dynamics. For example, the objective of the Procidades program in Brazil, which grants up to US\$50 million in financing to municipal governments, is to reduce the deficit in basic services and urban infrastructure



**TABLE 2 Sectoral IDB Projects at the Local Level**

Sector	Country	Cities	Amount
Renovations of historic downtown areas	Brazil	Olinda, Ouro Preto, Recife, Rio de Janeiro	\$62.5 million
	Colombia	Cartagena	\$322,000
	Ecuador	Quito	\$40 million
	Panama	Colón, Panama City	\$35 million
	<b>Total</b>		<b>\$137.8 million</b>
Transportation	Brazil	Curitiba, São Paulo	\$610 million
	Colombia	Bogotá, Cali	\$210 million
	Panama	Panama City	\$1 million
	Peru	Lima	\$45 million
	Uruguay	Montevideo	\$80 million
	<b>Total</b>		<b>\$946 million</b>
Water and sanitation	Argentina	Buenos Aires	\$500 million
	Brazil	Bahia dos Santos, Manaus, São Paulo	\$1.8 billion
	Colombia	Medellín, Pasto	\$627.8 million
	Ecuador	Quito	\$136 million
	Honduras	Puerto Cortés	\$18.3 million
	Mexico	Monterrey	\$325 million
	Nicaragua	Managua	\$15 million
	<b>Total</b>		<b>\$3.4 billion</b>
State modernization	Brazil	Multiple	\$328 million
	Chile	Multiple	\$10 million
	Colombia	Multiple	\$57.4 million
	El Salvador	At-risk areas	\$149,800
	Guatemala	Multiple	\$29 million

*(continued on next page)*

**TABLE 2 Sectoral IDB Projects at the Local Level (continued)**

Sector	Country	Cities	Amount
	Honduras	Tegucigalpa	\$22.5 million
	Nicaragua	Managua	\$7.2 million
	Trinidad and Tobago	Multiple	\$24.5 million
	Uruguay	Multiple	\$17.5 million
	<b>Total</b>		<b>\$645.9 million</b>
Housing and urban development	Bolivia	La Paz	\$28.5 million
	Brazil	Manaus, Porto Alegre, Rio de Janeiro	\$590 million
	Ecuador	Guayaquil	\$100 million
	Guatemala	Guatemala City	\$46.8 million
	Mexico	Multiple	\$500 million
	Uruguay	Montevideo	\$70 million
	<b>Total</b>		<b>\$1.3 billion</b>
Fiscal, financial, and expenditure management	Brazil	Multiple	\$459.4 million
	Colombia	Barranquilla, Santa Marta, Manizales, Pereira	\$947,000
	Costa Rica	Heredia, San Carlos	\$1.3 million
	Guatemala	Guatemala City	\$1 million
	Mexico	Mexico City	\$1 million
	Peru	Lima	\$1.2 million
	<b>Total</b>		<b>\$464.8 million</b>
<b>Total</b>			<b>\$7.0 billion</b>

Source: IDB (2009).

that has resulted from elevated levels of urban growth. To date, the project has provided financial support to 25 Brazilian cities.

Similarly, through the activities of the Sustainable Energy and Climate Change Initiative, created in 2007, efforts to mitigate and adapt to climate change have been incorporated into IDB operations, principally in fields such as greenhouse gas emission reduction in the energy, water, and environmental sectors and adaptation in areas especially vulnerable to the impact of climate change.

These initiatives have led to the accumulation of relevant experience for future projects that favor urban sustainability. One of the first lessons learned was the need for comprehensive treatment of urban problems. Given the Bank's sectoral focus, in some instances projects correspond to partial visions that do not take into account the links that exist between them. Therefore, it is necessary to coordinate the actions of the Bank's different sectors and increase understanding of the effects that each Bank project has on overall sustainability.

The second lesson is the importance of working closely with local authorities. Cities have assumed a growing leadership role in several areas, including climate change, given that actions with the greatest impact on the reduction of emissions and vulnerability materialize in cities. In this sense, cities offer an important space for implementing key sustainable development strategies.

A third lesson learned, through work with municipalities, is the variation in cities' managerial capacity throughout the region. In general, a persistent low level of managerial capacity in small cities makes the execution of projects in those cities difficult, whereas intermediate-sized and large cities tend to demonstrate greater institutional development. For this reason, it is advisable to coordinate projects in small cities with the central government of the country where the city is located but to work directly with the administrations of intermediate-sized and large cities. The size classification of each city will depend on the specifications of each country. That is, it is necessary to consider the heterogeneity present in the local institutional development and consider the different categories of cities to be helped.

## **Elements for Evaluating and Planning Sustainable Urban Development**

Tackling urban sustainability in LAC requires a methodological tool for understanding the current state of urban development, establishing priorities, and presenting specific proposals to strengthen urban growth in accordance with the environmental context and, at the same time, provide incentives for economic development, social inclusion, and a solid institutional and fiscal situation. The methodology should be based on work with local authorities and citizens and employ indicators and instruments of analysis that allow specific actions to be determined that respond to the most critical obstacles to sustainability. Furthermore, it is essential to

have mechanisms for monitoring progress and guaranteeing success over time.

This methodology should analyze the sustainability of cities in the same three basic dimensions described earlier, in the section on urban challenges in the region: (i) disaster risk and climate change, (ii) comprehensive urban development, and (iii) fiscal management, governability and transparency. These dimensions should be viewed holistically, taking into account the interactions between them, the city's economic and social development, and the environment.

The dimension of climate change and disaster risk is centered on environmental management and the control of local pollution, climate change mitigation, and the prevention and reduction of vulnerability to natural disasters. The comprehensive urban development dimension refers to the design of the city and its footprint, social equality and unequal distribution of services, efficacy of city transportation, the city's competitiveness, and public safety. The fiscal management, governability, and transparency dimension is related to local government capacity to finance necessary investments, provide services with adequate coverage and quality, control expenditure and debt, and make decisions in a way that is transparent, planned, and effective.

To implement this proposed comprehensive approach, the analytical tool should identify key and urgent urban sustainability issues and their strategic solutions. In the first stage, which would have three phases, the conditions

of a particular city with respect to the dimensions and their relationship to one another should be diagnosed. The first phase would be the construction of indicators to measure the position of the city on each of the dimensions. The second would consist of analysis and metrics to identify the city's gaps relative to the values for the indicators observed in cities of similar socioeconomic development. Lastly, the third phase would determine criteria for prioritizing sectors with the highest impact on urban sustainability, as well as the policy choices to be made to close the gaps identified in the second phase. This process would contribute to the construction of an action plan for each city that would also include a monitoring and evaluation system that would allow the tracking of the sustainability indicators defined in each dimension.

In summary, the analytical tool would involve three components: systematic, normative, and procedural.<sup>20</sup> The systematic component would pertain to the definition and construction of the indicators necessary for a diagnosis of the situation on the three dimensions. The normative component would aid in the establishment of goals for the different indicators by identifying existing gaps. Finally, the procedural space would consider the appropriate means of establishing priorities and integrating the people involved in the city's development, building bridges that would link the normative aspects with the systematic ones. Once this analytical tool was applied, the city would have the following products at its disposal:

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<sup>20</sup> Similar to those suggested by Wiek and Binder (2005).

(i) a diagnostic assessment that allows problems to be prioritized, (ii) a plan of action that reflects these priorities, (iii) a set of viable projects to implement that plan, and (iv) a monitoring system to measure progress and communicate it to the population.

## **Focus on Intermediate-Sized Cities**

An assessment of population growth in the different countries of LAC reveals that the region's intermediate-sized cities are growing at a higher rate than its large ones. With the exception of those in Colombia and Peru,<sup>21</sup> midsize urban centers in the region are more dynamic than the larger ones. In an analysis of Mexico, for which municipal-level data are available, the economic component of the Human Development Index shows lower levels of growth in the largest cities than in the intermediate-sized ones. This indicates that the greatest challenge to urban sustainability in LAC will be in these intermediate-sized cities that are dominating the region's population and economic growth. In particular, these intermediate-sized cities face the challenge of achieving sustainable development that does not repeat the errors of the large Latin American metropolises.

As intermediate-sized cities are experiencing important economic and population growth, the future of urban

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<sup>21</sup> Two countries where the supremacy of the capitals, Bogotá and Lima, was not as significant as in other countries in the region in the middle of the twentieth century.

development in LAC depends to a great extent on what happens with them. In addition, intermediate-sized cities are worth focusing on because they are in a stage of development in which it is still possible to exploit economies of scale and control the costs of agglomeration, elevating global efficiency. Furthermore, projects geared toward sustainability can be particularly effective at the scale of these cities. Finally, improving the sustainability of intermediate-sized cities and the quality of life within them would reduce population and economic pressure on the large metropolises, which in effect would facilitate projects to reduce the great inequalities that characterize these large urban centers.



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## Final Comments

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URBAN SUSTAINABILITY IN LAC is a key element in attending to the needs of the region's countries in terms of prevention and mitigation of climate change, development of infrastructure to become and stay competitive, reduction of inequalities, and establishment of institutions for growth and social well-being. Regional issues require a comprehensive vision of urban development to fulfill the multiple objectives of a modern strategy of development. Through a review of the theoretical and empirical progress of the concept of urban sustainability and the reality of the cities in the region, this document has presented a proposal for holistic analysis. Implementation of this type of analysis requires the design of specific tools of study applicable to the cities of LAC. The Bank, which has played an important role in the region's growth, adds to this new effort in sustainable development through the Ninth General Capital Increase.

In the case of LAC, work with intermediate-sized cities is suggested because they currently present the greatest dynamism in growth. As these cities begin to define their

plans and projects in their process of expansion, there is an opportunity to advance new ways to deal with climate change, with a model that fosters lower greenhouse gas emissions, stricter pollution control, increased resilience, more equitable urban development, better governance, and greater fiscal support. All of this would result in a higher quality of life for Latin American and Caribbean citizens.

The support of donors and multilateral entities in this task will be fundamental to consolidating a new approach to urban sustainability in LAC.

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