



## Sustainable cities in Latin America

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### CLIMATE CHANGE IN LATIN AMERICA AND THE CARIBBEAN: THE CHALLENGE AND OPPORTUNITY FOR SUSTAINABLE URBAN DEVELOPMENT.

In the present day, Latin America is the most urbanised region - and also the most inequitable - on the planet, which means that its urban areas amass both huge wealth and huge poverty. Within this context, dealing with climate change is also a chance to increase citizens' well-being. Better public transport and more efficient energy and waste management are, besides being effective measures to reduce emissions, ultimately actions with a strong social component and work towards improving transportation and public health care and generate savings for citizens. Equally, actions geared towards boosting urban resilience represent measures that go beyond adaptation responses to climate change and primarily benefit those that are most vulnerable in the population.

### SUSTAINABLE CITIES IN LAC: LESSONS FOR THE WORLD

In the context of the future new global climate agreement, cities are taking a more prominent role in this new urban era, and gained in importance in the Sustainable Development Goals, LAC has a lot to give in the lessons learned from urbanisation. Rapidly urbanising regions like Asia and Africa, where population growth will be concentrated in cities in the present and near future, could learn a lot from the urbanisation process that has occurred, and continues to occur, in LAC. From the transport industry to energy and water, successful cases are numerous and varied, as are the setbacks, from which valuable lessons can be drawn for the purposes of more effectively facing up to this new global urban reality.

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## 1. INTRODUCTION: OPPORTUNITIES AND CHALLENGES FOR DEVELOPING SUSTAINABLE CITIES IN THE REGION

Cities play a key role in meeting new international efforts on climate change because they are home to over half the global population, consuming around two thirds of the planet's energy and generating a similar proportion of wealth and global greenhouse gas (GHG) emissions. Similarly, cities are increasingly more vulnerable to the effects of climate change, and, as a result, it is in these cities where a large part of the fight against climate change in the coming years will take place.

Sub-national entities can potentially contribute to 10-20% of the solution in standing a good chance of limiting the global temperature increase to less than 2°C above pre-industrial levels at the end of the century (UNEP, 2015), (UNEP, 2014a).

Close to 10% of the global population and around 15% of the planet's total urban population live in Latin America and the Caribbean (LAC). It is the most urbanised developing region and has the highest rate of urbanisation on the planet – 8 out of every 10 inhabitants currently live in cities. Despite the deceleration of growth rates in both the total population and in urbanisation, in absolute terms the population in LAC will grow from over 600 million inhabitants at present to 900 million in half a century (50% more), and the urban population will climb from 500 to 800 million (60% more). That is to say, all future population growth in LAC will occur in cities (World Bank, 2015), (UN-Habitat, 2012), (UN-DESA, 2014).

The rapid population growth in the second half of the 20<sup>th</sup> century in LAC is owed in part to rural-urban migration and high fertility rates, and the absence of suitable urban planning and management plans. In turn this has given rise to other serious problems, for instance rapid territorial expansion and the ensuing shortcomings in the

delivery of basic services, social and spatial fragmentation, informal settlements and employment, a greater demand for natural resources stemming from their scarcity in some instances (water), environmental degradation, traffic congestion and growing levels of inequality, insecurity and violence<sup>1</sup>. Climate change and its effects also add to, and worsen, the equation, making cities even more vulnerable.

Consequently, managing sustainable cities is key to ensuring the appropriate sustainable policy-making regionally. Environmental sustainability could represent a vehicle for reaching higher levels of prosperity and overcoming major present-day problems – sustainable cities are more productive, competitive, innovative and prosperous and facilitate environmental preservation, as well as providing a better quality of life and well-being for people (UN-Habitat, 2013). This is possible when social and environmental objectives are integrated into cities' economic targets.

In LAC some indications point to cities moving in the right direction, with a third of Latin American cities supporting the Covenant of Mayors (34 out of 100), and therefore have committed to measuring and reporting indicators, demonstrating the leadership of sub-national actors in the region, and in the new agenda of international development. For instance, one of the Sustainable Development Goals is specifically focused on cities, and many contain highly relevant cross-cutting issues (energy, waste, transport). Therefore, it is not unreasonable to expect that inside or outside the framework of the new international agreement on climate change an important space will be dedicated to cities.

A similar ratio of Latin American cities (100 out of 300) have signed the Mexico City Pact, through

1. 9 out of 10 cities with the highest homicide rates are Latin American (AFD, 2014).

which there is a commitment to establishing and reporting their inventories of GHG emissions, as well as reduction targets and activities for reaching these goals, as well as adaptation – this is the case with 90 of the 300 cities that report to the CDP<sup>2</sup> on a global scale. A wide variety of initiatives promoting sustainable cities in the region, with a sectorial focus – transport, energy, waste, water – individually and as a network, have taken place in recent years, and are gaining a certain degree of momentum at present.

Despite the commitments undertaken, global sub-national initiatives, especially in LAC, often end up isolated and disjointed, which means they have a long road to travel down before they can to realise their potential.

There is a need to strengthen the links between the national (e.g. INDC<sup>3</sup>) and sub-national processes regarding climate change in order to raise the level of ambition and national unity through sub-national initiatives, establish targets and transparent goals to quantify emissions and reductions, consolidate schemes of climate governance on a sub-national level in the region in order to deal with processes in a coordinated manner and facilitate access to direct financing for cities so as to strengthen and bring together existing networks to reach higher levels of ambition, among others.

There is a wide demand, which remains unmet, for sub-national entities to create conditions that enable the region as a whole to move towards sustainability - this can be viewed as an opportunity.

Sectors that represent areas of opportunity for reducing emissions, and also possess relevant experience, include: transport, housing and services, industry, waste and water. The transport industry, in particular, is responsible for half the emissions in LAC cities, making it a priority sector to address, and one with numerous successful initiatives that can be replicated or built upon. In terms of adaptation/vulnerability, there are no clear mitigation measures, and the needs of each city vary from case to case, making it difficult to put forward a general recommendation beyond the clear evidence that many cities acknowledge the risks posed by climate change and are ready to tackle it.

This paper is organised around: a first section that introduces a general summary; a second section with the **causes** and **effects** of urbanisation processes in LAC; and a third which references the **responses** to the effects highlighted by cities in the region, followed by conclusions.

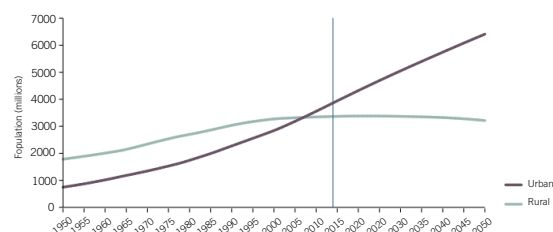
Causas	Effects	Responses
<ul style="list-style-type: none"> <li>Urban explosion</li> <li>Rapid territorial expansion</li> <li>Low-capacity for territorial planning and management</li> <li>(Unequal) increase in the urban GDP</li> </ul>	<ul style="list-style-type: none"> <li>A greater demand for resources</li> <li>Informal settlements</li> <li>Basic lack of services</li> <li>Inequality</li> <li>Insecurity</li> <li>Environmental deterioration</li> <li>Traffic congestion</li> <li>Physical and social fragmentation</li> </ul>	<ul style="list-style-type: none"> <li>Transport: Mass and alternative transport means</li> <li>Energy: energy efficiency and public streetlights</li> <li>Water: Water Funds</li> <li>Risk management</li> </ul>

## 2. THE GLOBAL CONTEXT OF URBANISATION AND THE CLIMATE CHALLENGES IN THE REGION: WHY ARE CITIES SO IMPORTANT AND WHY IS IT IMPORTANT FOR THEM TO BE SUSTAINABLE?

### 2.1. The context of urbanisation in the world and in the region

The world population currently stands at around 7.2 billion people (World Bank, 2015), and, for the first time ever, more people now live in urban areas than rural areas - 54% of the world population were living in urban areas in 2014. (UNDESA, 2014), (UN-Habitat, 2010), (see figure 1).

**Figure 1.** The world's urban and rural population, 1950–2050



Source: (UNDESA, 2014)

Today the most urbanised regions include North America (82% of the population inhabit urban areas), Latin America and the Caribbean (LAC) (80%), and Europe (73%). It is anticipated that continual population growth and urbanisation will add 2.5 billion people to the world's urban population by 2050 - the conurbations with the highest growth can be found in medium-sized cities and those with fewer than one million inhabitants.

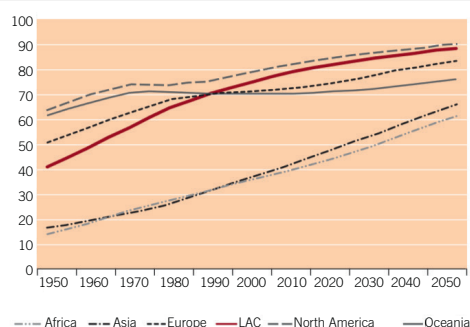
Latin America and the Caribbean have a population of 622 million inhabitants (World Bank, 2010), equivalent to less than 10% of the world population. Around 500 million Latin Americans live in urban areas, which is equivalent to 15% of the world's urban population. Besides being the most urbanised

2. Carbon Disclosure Project, a global platform to report on cities and companies

3. Intended Nationally Determined Contributions.

developing region, it is also the one with the fastest urbanisation rate (see figure below): in 1950, close to 40% of its population lived in cities, a figure which has now doubled, with the number expected to reach 90% by 2050 (UNDESA, 2014), (IDB, 2011), (Lattes, 2000), (World Bank, 2015).

**Figure 2.** Percentage of the population living in urban area, by region, 1950–2050



Source: (IDB, 2011)

The dramatic total population growth in LAC over the past century has not been constant, and from the 1960s onwards it has tended to be moderate. When this decade got under way, the regional population increased by an average of 2.75% annually; currently, it is estimated at 1.15%, a similar to rate to the one observed on a global scale. Projections indicate that this deceleration will continue in the future, in such a way that the regional population will grow less than 1% annually until 2030; in other words, a usual rate of growth.

Nevertheless, the urban population in LAC continues to grow, and by the middle of the 21<sup>st</sup> century LAC cities will house close to 300 million people more than the current number, an increase representing 60% of today's urban population. Given that it is one of the least populated regions in relation to its land mass, the risk is that this growth - as in the past - will take place with a huge territorial expansion and with the negative effects that go with it. This will be analysed below.

The urbanisation process in Latin American countries until the 1970s was characterised by the following:

- i) High demographic growth in urban areas – and the importance of its impact on the population – due to high levels of fertility and, overall, the significance of rural/urban migration.
- ii) The reclassification of rural spaces, and
- iii) An ongoing trend for the population to be concentrated in bigger cities, thus boosting metropolitanization (ECLAC, 2002).

Part of the demographic stabilisation in LAC in the decades that followed 1970 has been owed in

part to a notable rise in life expectancy, which in this period of time has increased from 51.4 to 74.5 years of age, and in part to a decrease in fertility rates, shifting from 5.8 children per woman in 1958 to 2.09 in 2010.

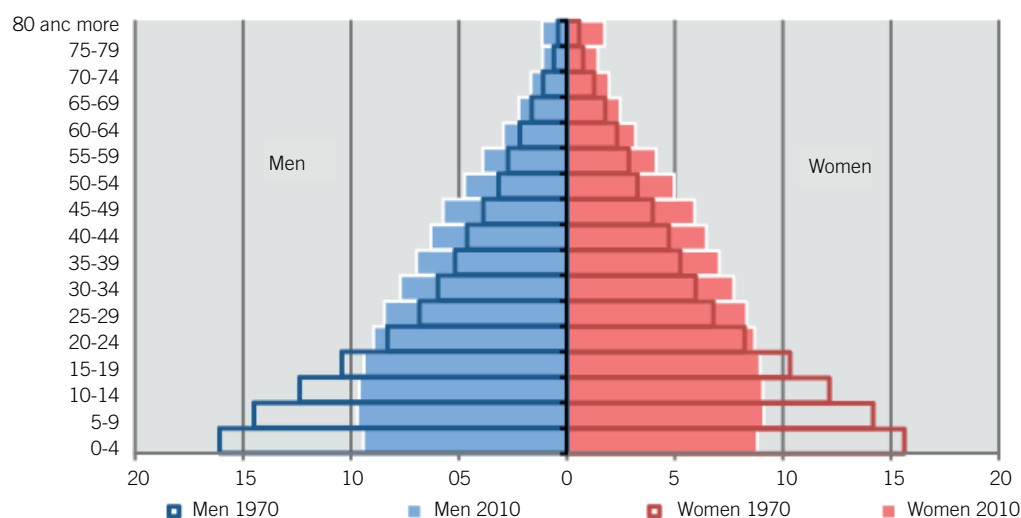
The high speed of urbanisation processes in Latin America and the Caribbean until 1970 came at a high social, economic and environmental cost, with many LAC cities undergoing a traumatic and sometimes violent speed of urban transformation, marked by a deteriorating environment. Today there is still profound social inequality.

As a whole, the cities in this region are the most unequal on the planet (UN-Habitat, 2012), and lack suitable territorial planning and management processes, which in turn has a huge impact on the environment because of the use of resources. Cities, not just in LAC but in general, not only amass the highest proportion of the world population, they also have the most concentrated the use of energy, resources, greenhouse gas emissions (GHG), as well as environmental degradation and poverty.

Proof of how this urban growth has not always resulted in the best living conditions for inhabitants can be seen in:

- 117 million people (1 out of every 4 settlers in the region) living in informal settlements (IDB, 2011).
- Two thirds of the people in the region living in poverty (118 million) reside in urban areas, despite approximately two thirds of the wealth generated in LAC being in cities (IDB, 2011).
- Approximately 124 million city inhabitants (1 out of every 4 people living in cities) living in conditions of poverty (UN-Habitat, 2012).
- The richest quintile in LAC assembling 57% of the total income, and the poorest quintile only 3% (UN-Habitat, 2010). Both quintiles are mainly concentrated in cities.
- 72% of young people aged between 15 and 24 in LAC urban areas not having social security (health) cover (UN-Habitat, 2010).
- Close to 10% of the total population in LAC (60 million) not having safe and permanent access to drinking water sources (ADERASA, 2012).
- On average, around 40% of purified water being lost in distribution to the end user (UN-Habitat, 2012).
- Around 100 million people (16%) lacking adequate sanitation (UN-Habitat, 2012).
- Only 15% of waste water generated in LAC cities being treated (IDB, 2011), resulting in risks to health and the environment.

To a certain extent, this urbanisation, poverty and inequality paradox can be explained by the displacement of the rural population, which resulted in a concentration of property and low

**Figure 3.** LAC. Population structure by sex and age group, 1970 and 2010

Source: (UN-Habitat, 2012)

rural productivity levels; scant urban regulations and the establishment of informal settlements; centralisation, and, in the case of the Caribbean, the strengthening of island countries. Therefore, a substantial part of the “urbanisation excess” is due to the disproportionate growth of large metropolises, caused by the factors mentioned above.

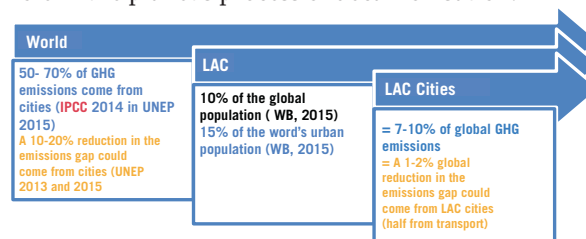
However, the population structure, with more people of working age than dependents, means the region is currently in a situation that favours the drive towards development and the allocation of financial resources for savings and investment in social areas, one of which is the fight against poverty. The phenomenon, a so-called ‘demographic dividend’, is far from homogenous and, while in countries like Cuba and Chile it is coming to an end, in others, for instance Guatemala, Paraguay and Bolivia, it is virtually just beginning (UN-Habitat, 2012).

## 2.2. Cities facing climate change:

### 2.2.1. Urban emissions

Between 50-70% of global GHG emissions come from cities and 15% of the world’s urban population lives in LAC, which means that almost 10% of global emissions come from LAC cities. Similarly, 10-20% of emission reductions needed to close the ‘emissions gap’ could come from cities, which means that 1-2% of the solution can be found in LAC cities. Although there is recognition that the historical and current contribution to global warming from the Global South and LAC

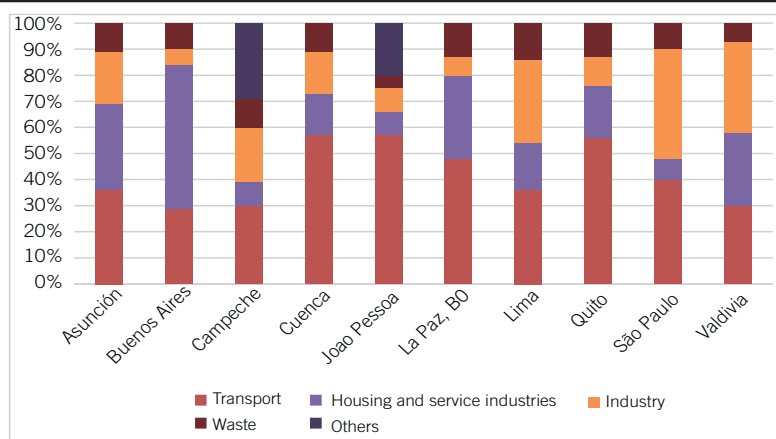
in particular is proportionally far less than other developed regions, it does not free Global South countries and from the need to take on an active role in the planet’s process of decarbonisation.



Around 90 cities in the region measure and report their GHG emission inventories to CDP, out of a total of around 300 cities globally. A report of Latin American cities (CDP, 2014), based on a sample of 46 major cities, shows how most efforts to reduce emissions are concentrated in transport industries (infrastructure for non-motorised transport, improvements to fuel efficiency, managing transport demands, improved public transport infrastructure, etc.) and energy (energy efficiency measures/retrofitting, efficient technologies for lighting, the construction of codes and standards, generating renewable energy, etc.).

Inter-American Development Bank (IBD)’s Emerging and Sustainable Cities Initiative, which brings together more than 50 medium-sized cities in the region with an aggregate population of over 50 million inhabitants (close to 10% of the urban population in LAC), provides a panoramic view of



**Figure 4.** Industries' participation in GHG emission in LAC cities

Source: Developed in-house by (IBD, 2015), (Cities Footprint Project, 2013), (APra, 2004) and (CETESB, 2011).

the emissions situation. Moreover, by joining other initiatives like the Cities Footprint Project, those industries with a greater contribution to emissions in the region can be identified. On average, transport represents close to half of emissions (42%), whereas the housing sector and service industry are concentrated in 23%; both amass two thirds of emissions in LAC cities.

We can explain why the sector with the greatest contribution to emissions in cities is transport as LAC has the highest motorisation level in developing regions, climbing from 100 vehicles per 1,000 in 1990 to 155 in 2005 before reaching 169 per 1,000 in 2008. Increased income, an expanding middle class, a growing car industry and the availability of affordable vehicles are some of the reasons that have boosted motorisation in the region. The result is that the region's cities are experiencing serious traffic congestion, which costs 2.2 billion US dollars per year in lost productivity, and the time spent in traffic jams has adverse effects on quality of life, causing pollution, traffic accidents, higher fuel consumption and higher GHG emissions (UN-Habitat, 2013).

### 2.2.2. Cities also have to increase their efforts towards adaptation

LAC is a region that is especially vulnerable to the effects of climate change, as indicated below (University of Cambridge and ICLEI, 2014):

- Many emerging climate risks are concentrated in cities. Urban areas house a significant part of the physical assets and economic activities, as well as a large part of the population and economic activities that are most vulnerable to climate change.
- The impacts of climate change are increasing in severity and frequency. Some key problems include rising temperatures, heatwaves, water

safety and pollution, rising sea levels, storms, extreme weather events, strong rain and wind, floods, food security and ocean acidification.

- Building greater resilience and sustainable development in urban areas could speed up the adaptation to global climate change, and there are options for adaptation in areas like water, food, energy and transport.
- Many rapidly developing cities lack the financial, technological, institutional and governance capacity required to address these challenges.

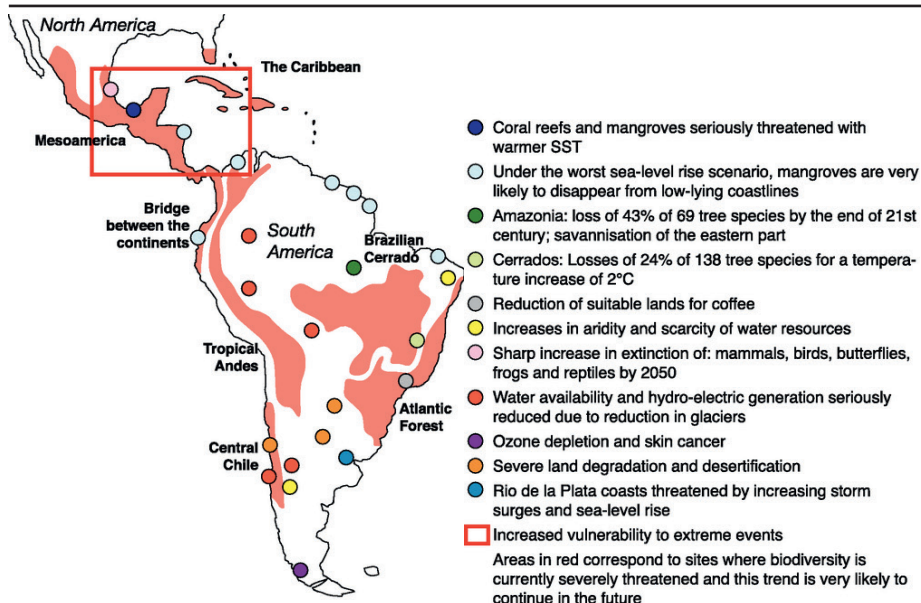
Of the total Latin American and Caribbean population, 73% live in low-lying coastal areas, making them particularly vulnerable to the effects of climate change, for instance more frequent flooding and a higher rate of extreme hydro-climatic events, as well as rising sea levels. Moreover, the region is generally not prepared to respond to these natural disasters, with a large part of cities' critical infrastructure located in vulnerable areas (IBD, 2015).

The Intergovernmental Panel on Climate Change (IPCC) indicates that the possible effects of a rising temperature on a global and regional scale may mean LAC will have to deal with: the disappearance of corals, a loss of biodiversity, a reduction of land that is suitable for cultivating certain species and the subsequent reduction in the production of food and food quality, a higher scarcity of water resources (including glacial retreat), the spread of vector-borne diseases and those caused by latitude and altitude, among others (IPCC, 2014), (IPCC, 2007) and (CDKN, 2012).

As a whole, the region faces significant challenges stemming from temperature increases, resulting in annual damages of 100 billion dollars (CDP, 2014).

In view of the multiple climate change threats the region faces, particularly in cities, it is apparent

Figure 5. The main climate threats in LAC



Source: (IPCC, 2007)

that adaptation must be a cross-cutting theme running across urban development planning processes. At present, this trend is gaining ground and there are clearly a number of adaptation, resilience and risk management initiatives in the region's cities. These, and the cities' responses, are described in the following section.

### 3. INCREASING EFFORTS TO DEVELOP SUSTAINABLE CITIES IN THE REGION

#### 3.1. The current efforts

An analysis of the responses in cities begins with an evaluation of the **comparative studies** of the region's cities - for instance the Latin American Green City Index (Siemens, 2011), the CDP's 2014 report on Latin American cities (CDP, 2014), and products from IBD's Emerging and Sustainable Cities Initiative - in order to provide a general outlook. This is complemented with an **analysis of networks and initiatives** of global cities, for instance cCR (the carbonn Climate Registry), C40, the Mexico City Pact, the Covenant of Mayors and NAZCA, focused on LAC cities. Furthermore, the main results and lessons learned from certain **projects** (individual and collective) in the region, divided into industries, are also presented. The section is concluded with an analysis of the **national scope of the initiatives** that promote the emergence of local initiatives.

#### 3.1.1. Comparative studies

##### *Latin American Green City Index*

The LAC Green City Index is a Siemens-sponsored initiative carried out by the Economist Intelligence Unit. It aims to measure and evaluate the environmental performances of 17 major cities in Latin America, based on a series of criteria divided into 8 categories:

- Energy and CO<sub>2</sub>
- Transport
- Land use and buildings
- Waste
- Water
- Sanitation
- Air quality
- Environmental governance

The report aims to supply all interest groups with a tool that enables Latin American cities to learn from one another and, therefore, find the best way of approaching the common environmental challenges they face.

One of the report's main findings, which, when applied to 17 LAC cities - with the necessary caution - can generally apply to the majority of the region's cities, is that there is no clear relationship between environmental performance and the level of income in the city, measured in terms of the average per capita GDP.

This is in contrast to the strong correlation found between environmental performance and the per capita GDP clearly found in similar studies on other regions, including Europe and Asia. Despite

the fact that there is a need to explore this situation in more depth in order to draw conclusions, in principle indications suggest that there can be a high level of environmental performance in cities without necessarily having the corresponding high income.

In terms of transport, the number of vehicles per person clearly increases in accordance with the per capita income, regardless of the quality or size of the public transport system, resulting in a greater use of energy and higher GHG emissions, along with deteriorating air quality.

With regard to solid waste, the majority of cities analysed have a good waste collection service, with a collection and disposal average of 96%. Yet the performance is lower when it comes to recycling and many cities demonstrate middling results.

Drinking water coverage is over 90% (98%) in the cities analysed, which is proof of the importance administrations have placed on this issue. That said, losses of 35-40% in water distribution indicate a clear absence of incentives – possibly price-related – for better, and absolutely essential, management of the resource.

On average, 94% of the population in the study have access to sanitation, although this figure probably fails to reflect the situation in informal settlements. Conversely, the treatment of waste water only reaches 52% of the contaminated effluents (a much lower figure, according to ADERASA, 2012), and part of the problem could be due to the high cost of waste water and the fact it is less of a priority than basic sanitation services.

Air quality is also a latent problem, partly because of a deeply rooted and growing private car culture, in parallel with the growth of the middle class in the region's cities. Although on average the values of the three variables monitored, under the recommendations of the World Health Organisation (WHO), do not exceed the allowed limits, in general they are worryingly close. Monitoring systems in every city in the study are proof of the importance placed on this issue, which is directly related to inhabitants' health.

There are formal structures of environmental governance in every city in the study, yet they are implemented at differing levels of effectiveness. All the cities have units in charge of managing environmental issues, the majority of which co-ordinate with other units inside and outside their municipalities. A moderate percentage of cities in the study show the full capacity to implement their own policies, monitoring and reporting environmental performances, and around half of the cities include climate change in their management systems. On the other side, overlapping powers

appear to exist in levels of government, which is partly down to the fact that territorial expansion has been channelled into metropolitan areas with different conurbation administrations.

Furthermore, they have a negative effect on successful governance, with short-term policies, decentralisation, and a lack of technical, fiscal and administrative capacity. There is also a negative effect on the empowerment of local authorities, as well as the aforementioned overlapping in territorial jurisdictions and different levels of government, which can sometimes cause gaps in oversight. Yet, above all, a unifying vision of environmental and territorial management is clearly absent, whereby the work of the relevant actors' work is isolated, uncoordinated, and siloed, and pushes cities further away from their sustainability goal.

In a nutshell, in spite of the existence of important advances in the management of the sustainable development of cities in the region (some will be analysed in greater detail below to reveal the lessons learned and how they can be replicated or scaled), there are also major challenges to overcome that exist in parallel.

### *CDP 2014 LAC cities report*

This study focuses on how companies and cities are working together for the mitigation of and adaptation to climate change in the region. Its findings show that cities and companies face complex and interconnected risks and opportunities that can only start to be resolved with collaborative focus.

In a study of 46 cities, the results show that climate change poses significant risks to Latin American cities, and especially to the companies that operate in them. The majority of cities and companies consider the effects of climate change to be a threat to businesses' viability.

Nevertheless, the study also demonstrates that Latin American cities are implementing a wide range of activities geared towards reducing the risk to citizens and companies alike, and often in collaboration with local companies. Finally, the report shows that both cities and companies are broadly aligned in the way in which they plan to make the most of opportunities arising from the transition of a low-carbon economy. For instance, investment in the transport industry and energy efficiency projects represent activities that can benefit from collaboration (CDP, 2014).

In Peru, for instance, an innovative collaboration between the city of Arequipa and a copper mining company called Cerro Verde is improving the resilience of the city's water supply, whilst also increasing the financial drive to boost the economy. Cerro Verde's new water treatment plant, La Enzolada,

constitutes an investment of 334 million dollars and is entirely financed by the private sector. The city will benefit from better water from the region of Rio Chili, which currently supplies around 1 million people in Arequipa; an improvement that will reduce water-transmitted diseases and heighten the value of local farming products. The project is also estimated to bring 3.4 billion dollars to the Arequipa economy.

One of the main collaboration areas is transport. Latin American cities have reported 134 activities oriented towards a reduction of greenhouse gas emission in cities, with the transport industry the most common among them all.

In Mexico, the municipal governments' efforts to reduce traffic are also beneficial to businesses. CEMEX, a world leader in the building materials industry, built Bus Rapid Transit (BRT) systems in six Mexican cities, including Mexico City and Puebla, with an investment of 269 million dollars. The line in Puebla is expected to result in a 26,000-tonne reduction of CO<sub>2</sub> per year, with passengers saving between 35 and 45 minutes in travel time.

In Brazil, the CCR Group is capitalising on a similar need in cities. The Group have invested around 30 million dollars in transport systems, for example the Salvador metro and the Rio de Janeiro tram and ferry. The tram could save up to an average of 15 minutes per passenger in comparison to buses and generates a reduction of 0.135 tonnes of CO<sub>2</sub> per passenger annually, and when all these lines are in operation, the system's capacity will reach 285,000 passengers per year. Traffic reduction in Brazil is good for CCR businesses and for municipal governments.

A significant number of Latin American cities are adopting measures in the renewable energy sector. In line with the projections carried out by the Brazilian Wind Energy Association, the volume of wind energy hired in 2013 generated more than 70,000 jobs and 8.5 billion dollars in investment, which should result in 8.5 million homes being supplied with renewable energy. One reason behind this growth is the demand shown by the main population centres. Wind energy now provides electricity in cities like Fortaleza and Natal, located in north-east Brazil.

Something similar is happening in Mexico: a new wind park called Central Dominica II is currently being built in San Luis de Potosí, with a planned investment in the region of 150 million dollars. The new wind park will have the capacity for 100 MW, avoiding the emission of more than 157,000 tonnes of CO<sub>2</sub> into the atmosphere. The positive effects on cities are the jobs created in construction and park maintenance and the reduction of CO<sub>2</sub> from electricity generated from non-renewable sources.

### *The Emerging and Sustainable Cities Initiative*

The Emerging and Sustainable Cities Initiative (ESCI) of the Inter-American Development Bank (IDB) is a programme of technical assistance that looks to help medium-sized cities (from 0.1 to 2 million inhabitants) from Latin America and the Caribbean identify, prioritise and structure projects in order to improve environmental, urban and fiscal sustainability. Between 2010 and 2015 they have worked with more than 50 cities with a joint population of 50 million inhabitants (10% of the region's urban population).

Applying its methodology, based on a) an assessment of quality of life in urban areas and the development of an Action Plan, and b) putting in place the Action Plan, Pre-investment and monitoring, the work carried out has enabled cities to be compared on the basis of quantitative and qualitative indicators on areas that include:

- Water and sanitation
- Solid waste management
- Energy
- Air quality
- GHG emissions
- Vulnerability to extreme weather events
- Transport
- Employment
- Education
- Health
- Security

The ESCI methodology promotes the idea that well-planned, comprehensive and multi-sectorial urban development plans are able to bring about improvements to quality of life and set out a future that is more sustainable, resilient and inclusive for emerging Latin American and Caribbean cities (IBD, 2015).

Although the degree to which the methodology has been applied differs between cities, certain aspects can be stressed, for instance the fact that there is a centralised repository of public access, with information on cities that allows them to be characterised according to themed categories. Equally, it favours benchmarking between cities, which could lead to a knowledge exchange on a regional level that promotes better practices in the region. Furthermore, a web interface also allows users to put together personalised, individual or comparative reports, according to any of the 100 or more indicators available.

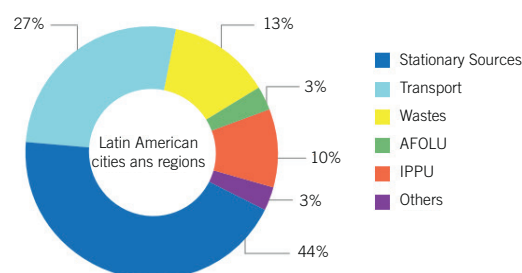
### 3.1.2. Networks and initiatives

#### Carbom Climate Registry (cCR)

cCR is a mechanism for cities and local governments to undertake commitments related to climate change (ICLEI, 2015), reporting their inventories of emissions, mitigation targets and the resources for fulfilling them, and, similarly, adaptation issues; 78 of the 526 sub-national entities that submit reports are from LAC.

An analysis of the composition of GHG emissions in Latin American cities reporting to cCR demonstrates that emissions from energy use in stationary sources (44%, primarily from the housing, commercial, industrial and public sectors) and transport aggregates (27%) represent over 70% of the sub-national emissions in the region, which is congruous with the presented data above.

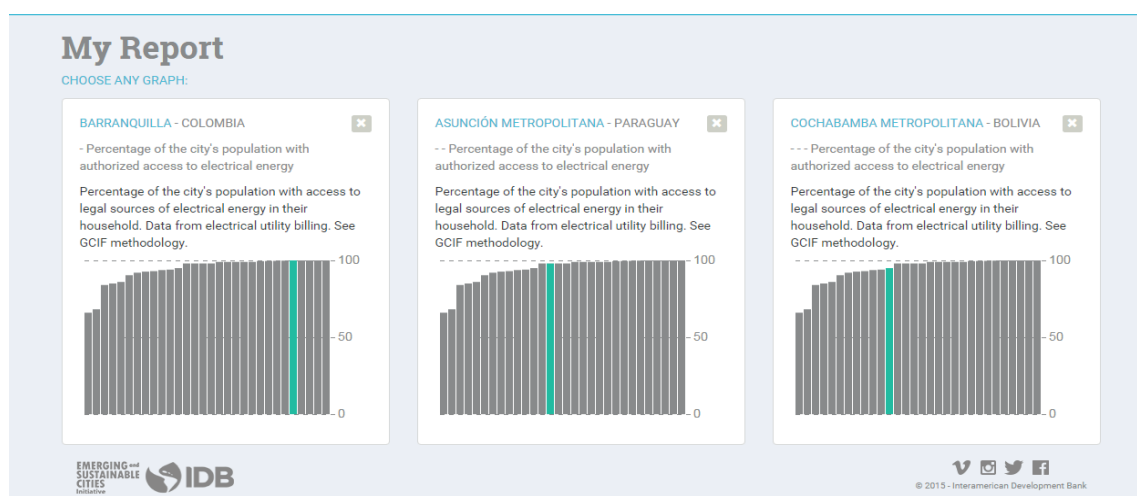
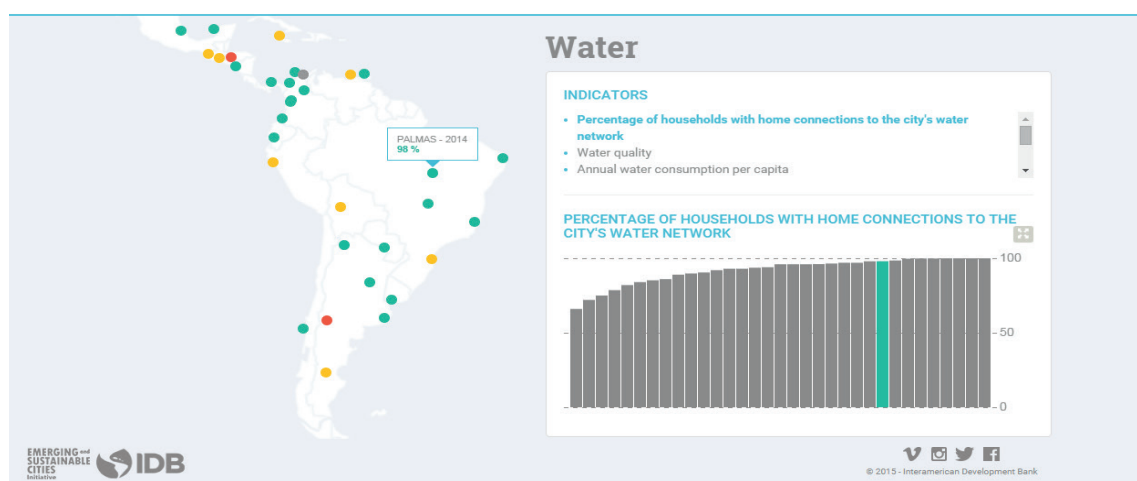
**Figure 6.** Composition of emissions in Latin American cities reporting to carbon



Source: (carbon Climate Registry, 2015)

#### C40 – Cities Climate Leadership Group

C40 is a network of megacities committed to taking action to reduce global GHG emissions, with 11 of the 50 member cities from LAC, concentrated in 14% of the region's population.



Source: [www.urbandashboard.org](http://www.urbandashboard.org)



Due to the fact that the sub-network of Latin American cities is beginning to gain strength, demonstrated with the first regional C40 Mayors Summit in LAC, held in March this year, the main advance of note is the Latin American Cities Declaration on the Covenant of Mayors. Through this declaration, 20 cities in the region (9 members of C40 and 11 non-members), representing around 100 million inhabitants (20% of the urban population), stated their intention of complying with the Covenant of Mayors, which sets out a series of criteria for cities to implement. These are outlined below.

### *Global Cities Covenant on Climate, the “Mexico City Pact”*

The Pact is made up of three main parts: the first highlights, through ten points, cities’ strategic position in combatting climate change; the second comprises ten climate commitments undertaken by cities; and the third defines the procedures by which cities report the extent to which the commitments undertaken are measurable, reportable and verifiable to the Cities Climate Registry, managed by carbonn and based in Bonn, Germany.

The strategic nature of the Pact arises through:

- The institutionality it provides to a global movement of cities.
- The demonstrable leadership of sub-national entities, within the framework of national international efforts in the fight against climate change.
- Its innovation, given that a global city agreement had not been previously set up.
- Its truly global scope, comprising cities that represent 14% of the world population.
- Its promotion of unity in diversity.
- The realistic impact it can have, which is both significant and relevant.

Of the cities to have signed up to the Pact, 102 are from LAC (close to a third of the total number), representing over 10% of the urban population in the region and demonstrating the high level of commitment to climate change issues on a sub-national level.

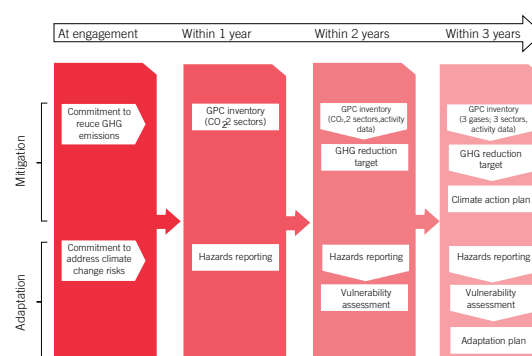
### *Covenant of Mayors*

The Covenant of Mayors is an agreement between city networks and, therefore, their members, to carry forward a transparent and collaborative approach to reducing GHG emissions in cities, to reducing vulnerability and to promoting resilience to climate change, consistently and complementarily with efforts to protect the climate on a national level. The Covenant is the biggest international cooperation initiative between mayors and local

authority representatives, who demonstrate their commitment to reducing greenhouse gas emissions and to preparing for the impact of climate change.

The Covenant joins the current efforts of Mayors that set up ambitious, voluntary commitments and targets to reduce GHG emissions and to address climate risks. It also reports progress made towards these goals being achieved through the fulfilment of rigorous and consistent reporting standards, and publishes this information as it is reported through a recognised platform of cities (cCR and CDP) (Covenant of Mayors, 2015).

The sub-national bodies that voluntarily adhere to the Covenant aim to fulfil 4 stages related to mitigation and adaptation within a 3-year period: Commitment, Measurement, Target and Action Plan.



Source: Covenant of Mayors (2015)

LAC represents 34 of the cities supporting the Covenant of Mayors, out of a total below 100 (Covenant of Mayors, 2015), and is one of the regions with the greatest number of member cities, thus manifesting its firm commitment to the process.

This process will enable standardised measures to be strengthened and deployed as a base for the management of sustainable urban development. This is a significant grey area in LAC, where there is a clear need to standardise the base lines and make them comparable in different cities.

### *Non-State Actor Zone for Climate Action (NAZCA)*

NAZCA publicly registers and shows commitments to climate action by companies, cities, regions and investors. It was launched at COP20 by the Peruvian Presidency, along with the LIMA-Paris Action Agenda, which is designed to act as a catalyst for public and private action on climate change before and after 2020, the year the universal climate change agreement in Paris (UNFCCC) will come into effect.

In September 2015, it showed 1,894 commitments by non-state actors. A couple of months later<sup>4</sup>, this figure reached 3,248 commitments, an increase by 1,354 or 71% (CMNUCC, 2015). This represents a major increase, over a very limited period of time, and, with events like the COP21 approaching, it could still accelerate.

The analysis according to the types of entities adopted by the platform: cities, regions, companies and investors (see table below), shows that the main increase during this period is to be found in the cities category. The number of “cities commitments” has more than doubled (from 424 to 935). Companies have the highest total number (1,778), and the highest absolute increase over the period (656).

Type of entity	Sep-15	Nov-15	Additional	Evolution
Cities	424	935	511	121%
Regions	85	117	32	38%
Companies	1,122	1,778	656	58%
Investors	263	418	155	59%
Subtotal	1,894	3,248	1,354	71%

Whereas in September, the LAC cities contributions was only 47 actions, equivalent to 11% of the actions registered by cities, and 2,4% of the total number of actions registered in NAZA, in November, this figure has modestly increased up to 54, which corresponds to a relative decrease of LAC cities proportion in the total number of cities commitments (5%), and in the total number of commitments (1,7%). This shows that the increase in LAC cities commitments did not follow the rhythm of the ones from other cities, or other entities in general.

### 3.1.3. Projects

#### *Examples of success stories: mitigation*

##### **>Transport: Medellín, Bogotá, Buenos Aires, Curitiba, Santiago, Mexico City**

The transport sector in LAC allocates large investments in infrastructure and teams and is the focus of widespread attention by authorities, particularly local ones, since it has an impact on a city's productivity, as well as the quality of life of its citizens. Equally, as previously discussed, it is the main contributor to GHG emissions in the region's cities, which means the projects to improve urban transport include – implicitly or explicitly – an environmental component.

Latin American cities have led the implementation of Mass Public Transport Systems, like BRT (Bus Rapid Transit), a means of transport generally characterised by the development of an infrastructure that prioritises public transport with regard to transport in other types of vehicles, offering the chance to pay the fare before taking a bus, for example, and also allowing rapid access to it. More than 45 cities in Latin America have invested in BRT-type systems, representing 63% of the number of passengers on BRT-type systems around the world (Rodriguez, 2013).

One emblematic example of urban transformation, through an intervention in the transport industry, is the project to develop and modernise the mass transport system in Medellín. Under a ‘social urbanism’ focus, and inside the city's Land-Use Plan, during the 2000s the first metro system in Colombia was built as a core part of the integrated transport system, and also consistent with BRT buses and transport with a cable system (cable cars). Social urbanism covers ‘simultaneous physical transformation, social intervention, institutional management and community participation’, and in Medellín it has advocated the inclusion of widely marginalised areas and has dignified areas where the poorest people live.

Since its inception, Medellín's mass public transport project has been geared towards promoting land equality, favouring State action on the outskirts of the city. These are the most vulnerable areas from a social, environmental and political perspective, where the lowest rate of human development and quality of life are apparent. Moreover, the project has generated more space and public services, including green areas, health centres, schools, the iconic library park and social housing spaces.

The mass public transport project in Medellín has given rise to a physical transformation of the city, allowing different points across it to be connected more effectively. Overall, however, it has brought about a cultural change, and integrated areas that have been historically marginalised, with co-benefits such as a reduction in violence and the promotion of economic dynamics related to economic activities, formal trade and the housing market. Ultimately, this has had an impact on an increase in the Quality-of-Life Index and the Human Development Index in the Communities of Medellín.

In the Colombian capital a significant change has also occurred in the mass transport system, focused on the Transmilenio project. The initial situation bore witness to a lack of capacities in public management, insufficient political support for change and the oversupply of public transport,

4. Website last visited on 09/07/2015 and 11/16/2015

which was also disorganised and had an old fleet and a relatively expensive service. With this framework, Transmilenio was introduced to compete in the transport market, and as a BRT initiative under concession to regulated private companies by the local government (a percentage of the income goes to the city, and buses and licences pay taxes and are liable to pay fines).

Once implemented, there was clear evidence that users viewed travel in a different light through Transmilenio - users were willing to wait and walk more because it was faster, and were even more willing to pay more for a higher quality service. This resulted in traditional mass public transport not increasing fares in 2005 in order to compete in the market, which ultimately benefitted users.

Certain lessons can be drawn from this experience, for instance (Ardila-Gómez):

- Centralised tax income creates a barrier to entering the conventional public transport market, and allows unequal situations of power to be balanced out, generating incentives for entrepreneurs and bus owners to subsequently reduce over-supply in the market, aligning their interests and allowing the leasing of buses and a driving service, as well as taxes to the government.
- Requests for coordination and dialogue between industry actors (regulatory bodies, public and private service providers, etc.) are essential.
- The focus must be on the benefit of the users, not the service providers.
- Government bodies must be strengthened in management processes.

Some other successful examples in Latin America include:

- Since 1965, Curitiba has implemented transport in its Development Plan as the core area the city's development is built around, and is a benchmark model both nationally and internationally. For over 50 years, the city has been able to manage its original design, integrating urban planning in the BRT transport system in such a way that development occurs throughout the corridors of the system, thus ensuring an easily accessible network for a large percentage of users and promoting high density and mixed-use land to avoid the physical expansion of the city centre, known as "transit-oriented development" (Moller, 2006) (Ibero-American Union of Municipalists, 2011).
- In contrast, other cities like Santiago de Chile or Bogotá, with stable urbanisation processes, have faced the challenge of tailoring mass transport systems to the existing city, duly offering competitive prices, replacing part of the old

fleet, under a principle of integration for different means of mass transport, and applying a user-focused approach.

- The Sustainable Mobility Plan in Buenos Aires has enabled a BRT system to be adopted, with articulated buses and hybrid vehicles which reduce GHG emissions whilst also promoting bicycle use by building cycle paths and parking within a public rental system, and subsidised loans for public employees to purchase bicycles in the hope that private companies follow suit.
- In Quito, there is limited access for vehicles in the city centre at weekends in order to promote a culture of pedestrians and cyclists.
- Mexico City has a compulsory public transport system to take children to school in order to reduce private car travel (Siemens, 2011).

### Energy

Buildings are responsible for over 40% of energy consumption in Buenos Aires, and are, therefore, a major source of GHG emissions. They include schools, hospitals, offices and cultural centres, among others. A great deal of waste was identified as arising because workers or users of public buildings are not obliged to pay the corresponding energy bills (exceeding 20 million US dollars per year) and therefore have little incentive for efficient consumption. Within this framework, the Environmental Protection Agency created the Programme of Energy Efficiency in Public Buildings (PEEEP, in its Spanish acronym) in 2008, in support of the policy to reduce GHG emissions in the city.

The objective of PEEEP is to optimise energy consumption in public buildings in order to set an example for the whole of society to follow via quantitative indicators. With PEEEP's implementation, energy diagnoses are made on public buildings, making it possible to advance in developing improvement recommendations for each one after identifying that 90% of the energy consumed in public buildings occurs in larger buildings.

In 2009, PEEEP was strengthened by the approval of Law 3246, which aims to reduce and optimise energy consumption in the city, as well as mitigating GHG emissions. In coordination with the National Institute of Industrial Technology and the Faculty of Engineering from the University of Buenos Aires, monitoring mechanisms have been put in place, for instance the Energy Management System.

The lessons learned from PEEEP include:

- The importance of relying upon a suitable institutional framework which enables activities to be developed with the necessary tools, including financing.



- Technical support for specialist local actors is key to the possibility of implementing this type of programme. Nevertheless, creating local capacities to give the process sustainability is equally important.
- Barriers must be analysed, for instance the subsidised cost of electrical energy in Buenos Aires, which ensures that the repayment of investments do not play a key role, economically, in replacing equipment.
- One way of overcoming barriers is through leadership and a commitment in high levels of decision-making, prioritising the reduction of energy consumption and GHG emissions (ICLEI, 2011) (Government of the City of Buenos Aires, 2015), (Government of the City of Buenos Aires, 2014), CEDOM, 2015).

Another example of a 'retrofit', or re-equipping, programme which aims to boost a city's energy efficiency and reduce GHG emissions via a clearly established goal can be found in Buenos Aires. One of most advanced global plans to switch to remotely controlled LED streetlights, a project to modernise public lighting in the Argentinian capital, aims to replace more than 90,000 conventional lights (more 70% of the total), with efficient products within 3 years (2013–2015), enabling it to be one of the cities with the most LED bulbs in the public lighting network, according to Argentina's Ministry of Environment and Public Space (La Nación, 2015). Therefore, if the project is successful, it could well be replicated in other cities across the country.

The provider developed a tailor-made solution for Buenos Aires that was based on its Telemangement platform and involved a centralised command to control the whole public lighting network. The system enables every light in the network to be monitored individually, with lights programmed to be switched on and off and reduced to suitable levels of lighting, depending on specific requirements. This has drastically reduced energy consumption.

Not only will this project enable a considerable reduction (40–50% of the total) in the city's energy consumption, it will also create an equal proportion of savings for the local government and mitigate emissions, doing so by using an innovative funding procedure: an energy performance contract. This method allows the local government to bring down a financial barrier, conditioning the payments to the provider for the service and effectively using more efficient energy from the system. In the case of Buenos Aires, this elements was included in the design of a public tender that would split the total cost of the projects, thereby reducing the necessary initial capital for investment through

savings. The initial investment will be recovered in 6 to 7 years, using luminaires with a useful life of approximately 20 years.

The coordinated leadership of local and national governments is a salient point in this example, and demonstrates how high-level commitment, articulated at different levels of government, generates synergies that can yield excellent results. Moreover, an innovative funding mechanism is also encouraging for similar ambitious projects in the future (La Nación, 2014).

Other examples of energy efficiency include:

- Belo Horizonte is a leader in solar energy in Brazil, and has 12 times the number of solar collectors per person than the whole country put together. Its new football stadium, built for the 2014 World Cup, has a unit that generates enough energy for its own operation, and on non-matchdays excess electricity is sold to a local energy company.
- In São Paulo, as in other cities in the region, the chance provided by the financing of the UNFCCC regulated emissions market has been maximised, under the Clean Development Mechanism, to cover part of the investment required to implement a system to generate electricity through solid waste in the city, thus simultaneously reducing emissions from solid waste and energy consumption.

### *Examples of success stories: adaptation*

#### *>Water: the Case of the Fund for the Protection of Water (FONAG) – Quito*

FONAG is the first water fund in Quito and one of the first in LAC, and was created in 1997 to meet water supply demands for the city of Quito, previously hindered by the scarce investment made in protected areas where water sources are found. Its successful model has spread throughout Latin America – the Latin American Water Funds Partnership has used the case of Quito as a model for the whole region, and it has even generated interest on other continents (UN-Water, 2011) (Agua Quito, 2015), (FONAG, 2015).

It is a financial mechanism set up to operate for eighty years in a permanent and stable manner, based on an equity fund that allows equity returns to be used for the co-financing of conservation and protection activities for the water sources that supply the demands of the Metropolitan District of Quito. Therefore, the aim is to meet medium- and long-terms goals to guarantee a positive and long-lasting impact in the conservation of water sources.

The fund will benefit 2.3 million people in urban and rural areas in the Metropolitan District

of Quito. Currently, 4,000 families have benefited and receive direct or indirect payments in the basin area. FONAG's equity capital is fuelled by mixed financial contributions from the Fund Constituents, including public companies (EPMAPS and Empresa Eléctrica Quito - EEQ (national), private companies (Cervecería Nacional and Tesalia Springs CO.); and others, for instance Camaren (a consortium of public and private companies) and The Nature Conservancy - TNC (international NGO).

After signing the Fideicomiso contract, the constituents formed seed capital equity to the value of 21,000 dollars, and the Public Metropolitan Company of Drinking Water and Sanitation (EPMAPS in its Spanish acronym), committed to providing 1% of the monthly turnover from its sources of drinking water and sewage, an amount that does not involve a price increase for the end consumer. Today, through the participation of new members, the equity capital has risen to 7,500,000 dollars. Of the total sum of investments made by the Fund in its programmes and projects, 25% corresponds to the financial yield of the Fund and 75% to contributions made by donors and partnerships.

One of the main reasons for FONAG's success has been the blueprint of its governance. FONAG's administrative bodies are made up of the Fideicomiso Board, comprising representatives from the constituent bodies in charge of decision-making; the Technical Secretariat, in charge of implementing operational activities, and Fiduciaria, which carries out legal representation and the custody of Fideicomiso assets. The Technical Committee is a consultancy authority of representatives from the Technical Secretariat and is made up of representatives from the Constituents.

FONAG's Technical Secretariat develops plans, strategies, regulations and activities that look to protect water basins and water treatment via Programmes and Projects which also include financial support from partnership institutions. They also use capital yields to co-finance activities, and restoration, conservation and maintenance Programmes and Projects for water basins, which supply inhabitants from the Metropolitan District of Quito and its spheres of influence. FONAG currently runs the following programmes: Water Management, Environmental Education, Training, Recovery of Vegetation Coverage, Surveillance and Monitoring, and Communication.

The range of financial services, which were initially rendered by FONAG, are oriented towards investment donations and, in a second phase, investment loans to local bodies specialised in formulating and implementing projects in interest areas, and within the lines of action in its programmes.

Furthermore, some of FONAG's lines of action are based on Metropolitan Ordinance 213, which delegates FONAG's implementation of the Master Plan of the Integrated Management of Water Resources and ratifies the transfer from EPMAPS of 1% of its turnover and an increase of up to 2% in a four-year period, with a 0.25% increase every year from 2008 to 2011.

The proven transparency of the management of funds, the establishment of relationships of trust and the definition of shared responsibilities between financiers, executors and beneficiaries have enabled FONAG to build levels of credibility and trust from contributors, donors, partners, key actors and water users, enabling a mirrored process of their initiative to be set up in 6 basins in Ecuador and 4 in Latin America as a whole. The creation of similar models in both Ecuador and in other countries proves that the mechanism can be easily adapted to diverse regions and situations, with its concept and application methods the key component.

The financial mechanisms created and designed for the long term have proven to be both effective and efficient, insofar as they have been able to join financial resources and the willingness of diverse actors to conserve water. This is a highly attractive mix with a simple set-up, which is the key to its importance.

Water treatment as a resource has become a priority for users, actors and water funds, and demonstrates the possibility of specialised mechanisms to carry out this work. By bringing a number of them together, joint responsibility adds, in its own right, value to the concept of the mechanism.

Other examples of water initiatives:

- Porto Alegre and the "Agua Correcta (Correct Water)" programme. Porto Alegre's "Agua Correcta" programme allows people from informal settlements to have legal access to water, as well as reducing leaks in the system and aiding water conservation. With no right of residence, inhabitants in informal settlements cannot legally connect their homes to the water supply, and the subsequent illegal connections not only involve a loss of income for the city, they are also prone to leakages and can lead to pollution in the water supply. In 2005, the city's water company, DMAE, started up a programme in cooperation with community groups in informal settlements. The city gave residents the chance to legally connect their homes to the water supply system, paying a subsidised rate of 5 US dollars per month for up to 10,000 litres of water, which represents a 40% saving on the standard rate. Moreover, the water bill is the inhabitants' only proof of

formal residency and helps them to integrate into the city's economy, and the programme also educates residents on the importance of clean water and the responsible use of the resource. In its first three years, the programme has helped 15,000 families and the rate of unpaid bills in informal settlements has dropped from 64% to 27%, giving rise to a general reduction from 14% to 9% in the city.

- Monterrey reduced water leakages from 32% in 1998 to 21% in 2008 through a comprehensive programme that checked and replaced valves, improved piping, installed pressure gauges and meters in homes, as well as detecting leaks and removing illegal connections.

#### ***Risk management: Adaptation Plan in Cartagena de Indias***

Cartagena de Indias is Colombia's most emblematic city and a World Heritage Site. It is also one of the country's development hubs and significantly contributes to economic growth (more than 2,500 industries contribute 6% to the national GDP) and has attracted growing investments in both the port and tourist infrastructures. Despite the fact that it has been established as one of the cities with the greatest international scope in Colombia, it is also one of the coastal cities that is most vulnerable to the effects of climate change (rainfall, temperature and a rising sea level), which generates environmental risks (flooding, landslides, increasing coastal erosion, pollution and the salinity in land and bodies of water), and affects human health and the socio-economic development of the city and its competitiveness (Mayor's Office of Cartagena de Indias, MADS, INVEMAR, CDKN and the Cartagena Chamber of Commerce, 2014), (CDKN, 2015).

Cartagena de Indias will become one of the first coastal cities in Colombia to move towards climate compatible development as its "PLAN 4C: A Competitive and Climate Compatible Cartagena" is made official. The Plan 4C is the outcome of a pioneering project headed by the Mayor's Office of Cartagena, with the participation of the Ministry of the Environment and Sustainable Development, the Cartagena Chamber of Commerce, INVEMAR, and the technical and financial support of the Climate and Development Knowledge Network (CDKN).

The project aims to integrate the adaptation to climate change in the city planning and in the management of the main economic sectors (the port, industry, tourism, transport and commerce) in order to boost competitiveness and sectorial and commercial development in the city and on its islands.

#### **Specific objectives**

To formulate a plan that encompasses priority strategies, measures, actions and adaptation projects.

- Define an operative, political, institutional and financial framework to implement the Plan 4C.
- Draw up a methodological guide, including lessons learned, to build adaptation plans in urban coastal areas that are scalable on a national level.
- Analyse climate vulnerability on the island territories of Cartagena and formulate guidelines of adaptation for these territories.
- Provide more in-depth training on climate change in institutions, industries and communities.
- Incorporate the risks associated with climate change and adaptation measures in the Zoning Plan (POT in its Spanish acronym)
- Understand the influence of climate change on investments and the city's economic and social development.
- Integrate the main economic, government and civil society sectors in the process of constructing adaptation guidelines, raising awareness of the effects of climate change and its impact on sustainability and growth in the city.
- Propose guidelines for adaptation to climate change in Cartagena.

CDKN has supported the set-up of the Plan 4C in the framework of the project "Integration of the adaptation to climate in the local and sectorial planning of Cartagena". This plan constitutes the second far-reaching accomplishment following the presentation of the vulnerability study and guidelines for the adaptation to climate change for Cartagena (2012). It represents a significant step forward in building a vision and definition of specific action needed to achieve development and growth that is compatible with climate change in the city, involving its most representative financial sectors and its population, whilst also looking to reduce its vulnerability to climate change.

In addition to the Plan, other results from the project include the Manual of Good Practices for Adaptation in Coastal Cities and Adaptation Guidelines for the island area of Cartagena de Indias.

According to the Marine and Coastal Research Institute (INVEMAR), the city of Cartagena de Indias represents one of the five most vulnerable areas to climate change in Colombia. Similar to numerous other coastal cities around the world and in this country, the historic Caribbean city and its population and economic activities suffer the consequences of weather variations and extreme

weather phenomena. Therefore, this situation is crying out for these threats to be turned into development opportunities for sectors in the Cartagena economy and its population.

The plan sees Cartagena become the first coastal city to create a long-term vision in which the climate of the future will be an opportunity for economic development and the welfare of its citizens.

Others:

#### *The response to climate change on the coast of Mexico:*

Identifying population growth on the Gulf of Mexico coast, as well as the extreme weather phenomena caused by climate change, as one of the factors that increases vulnerability in this zone. Thus, the main focus of the study is to show the ways in which a resilient urbanisation process, suited to a coastal context, can be addressed. It highlights the importance of having planning processes that jointly consider adaptation and mitigation measures as a tool for managing low-carbon, climate-resilient urban development (Jacob, 2010).

#### *A guide for drawing up Adaptation plans in Colombia's coastal cities:*

The preparation of this guide – one of the first of its kind in the region – was financed by CDKN and was undertaken by INVEMAR, a research organisation linked to Colombia's Ministry of Environment and Sustainable Development, whose mission is to conduct research into renewable natural resources and the environment in marine ecosystems and oceans of national interest. It aims to provide the necessary scientific knowledge to formulate policies, decision-making and draw up plans and projects that lead to the development of the above. They are oriented towards the sustainable handling of resources, to recovering the marine and coastal environment and to improving the quality of life for Colombians through the rational use of the Institute's scientific capacity and its coordination with other public and private entities. The guide's primary objective is to help urban planners understand and demarcate the process of adaptation within a technical and practical framework, backed by the good practices that others have carried out (INVEMAR, Laera Group, GCAP and CDKN [Eds.]. 2014). Some cities like Cartagena de Indias have already put the guide into use to generate the first adaptation plan in Colombia, which is outlined above.

#### *How to develop more resilient cities (UNISDR):*

Despite being a manual aimed at local government leaders in general, and not specifically at LAC, it

### **Box 1. A successful case of the institutionalisation of processes geared towards low-carbon, climate-resilient development: Quito, Ecuador.**

Quito's 2015–2025 Metropolitan Development Plan sets out clear guidelines for reducing the city's Carbon Footprints and includes objectives, strategic lines of action, goals and Programmes (e.g. Environmental Distinctiveness) that enable budget allocation for specific activities. It is based on the involvement of all sectors – particularly the private sector – in the city to look for common solutions under a logic of climate governance and joint responsibility. Moreover, it also encompasses capacity development, the articulation of efforts in numerous sectors and key actors under an institutional umbrella.

### **Box 2. Tapping into the potential of 'low-hanging fruits': energy efficiency in public lighting with energy performance contracts in Buenos Aires, Argentina.**

A contract-based project designed to modernise the public lighting system with LED light bulbs, under a model of energy performance contracts. Via these contracts, one part of the investment cost is covered by the savings generated by increased energy efficiency, conditioning the payment to the supplier for the products acquired and attaining annual savings on the levels established, which are verifiable as a whole.

It has enabled 90,000 public streetlights to be replaced in the period between 2012 and 2015, out of a total of 120,000 in the Argentinian capital, thus generating annual energy savings in the city, mitigating CO<sub>2</sub> emissions on the way to achieving a goal with a defined reduction, and improving levels of street lighting and citizens' safety. It has also made reinvesting the savings in improvements for citizens possible, whilst also improving the look of the city and 'visibly' promoting the concept of urban sustainability in practice.

does identify ten key aspects for attaining resilient cities, supported by the logic that resilience measures on the aforementioned Mexican and Colombian coasts could provide valuable lessons for other cities and countries in the region and around the world. It is a comprehensive manual and is highly recommended for cities in general (UNISDR, 2012).

#### **3.1.4. National initiatives advocating local initiatives**

##### *National Agendas of Sustainable Cities*

##### *>Ecuador: Quito Climate Pact*

The Metropolitan District of Quito, as an active participant and signatory in the Mexico City Pact, has ratified its commitment to leading climate change issues in Latin America, undertaking an



initiative to reproduce and expand this responsibility in all towns in Ecuador. After holding the “Quito Climate Pact” Summit, the Local Government of the Metropolitan Area of Quito, as an active participant and signatory of the Mexico City Pact, **ratifies its commitment to leading the fight against climate change in Ecuador and Latin America, calling upon 221 Mayors and 24 Political Authorities** to reproduce and expand their experience in the design and implementation of the Quito Climate Change Strategy and its Action Plan.

#### *> Peru: National Agenda of Sustainable Cities*

Presented at COP 20 in Lima, the current Agenda is the final design stages, under Peru’s Ministry of Environment. It aims to facilitate a process of transition towards resilient low-carbon economies in Peruvian cities and its implementation is expected to get under way in the coming months.

#### *NAMAs – Nationally Appropriate Mitigation Actions*

Until now, LAC leads NAMAs’ development proposals and project ideas, covering 50% of all NAMA proposals and feasibility studies at the end of 2013, with 26% geared towards the Middle East and Africa (UNEP, 2014).

A different approach focuses on involving sub-national governments and other local and national actors in NAMAs, called vertically integrated NAMAs, or v-NAMAs.

Of the sectors involved in NAMAs that have submitted information to the official registry UNFCCC, 36% have addressed the issue of energy supply, followed by 19% on transport and 14% in each of the sectors in buildings and waste (figures from the end of 2013) (UNEP, 2014), and all are related to the current situation cities face.

### **3.2. How to go further: the challenges of sustainable urbanisation**

Demographic sustainability implies both opportunities and challenges. On one hand, having an active population that is proportionally more important than in the past means the chance to make significant investments and prepare countries to deal with future challenges. The diminishing pace of urban growth also allows the problems that come out of accelerated growth to be avoided, concentrating efforts on improving spaces, infrastructures and existing services (UN-Habitat, 2012). This is an opportunity that is still not being utilised to its maximum potential.

The levels of ambition with regard to reduction targets are not as high as cities in developed countries, as demonstrated by the fact that of the 50 cities with reduction targets in GHG emissions, between 80 and 100%, only one (Puebla, Mexico) is from LAC (CDP, 2015). This could be owed, in part, to the fact that cities in the region still see the targets as overambitious and were not taken on board in the past in the fear that they could slow down development or simply not be fulfilled because of a lack of resources at the time (financial, technical) and the institutional framework at different levels of government to take on such commitments.

On the other hand, seeing urban areas expand is a concern, despite demographic deceleration. Cities’ growth is increasingly less compact and physically expands at a higher rate than their population – a trend that is unsustainable.

The region needs to foster territorial policies and urban planning that improves on current urban growth patterns to avoid the disparate growth of the city and to promote densification that better utilises space, thus avoiding higher physical and social segmentation. As previously demonstrated, success stories do exist in relation to transport, energy, etc. which, when scaled, can fulfil these objectives.

From an economic point of view, the overall picture is encouraging – Latin American and Caribbean countries have come out of a long period where debt was spiralling and seem to be better prepared to withstand global crises.

Over two thirds of the region’s wealth comes from cities and, although a large part of the added value produced is condensed into a handful of large metropolitan areas, the range of cities that contribute to this wealth have expanded and the productive potential of secondary urban centres has increased. This, added to the ‘demographic dividend’ that is present in the region, points to an advantageous framework for sustainable urban development in the medium-sized or small cities which represent over half the region’s total population.

On a local level, significant responsibilities have been transferred, which aids the emergence of a stronger culture of urban governance, and, in many countries, the main cities’ governments have gained considerable ground in national politics. This means that in sub-national processes they possess fertile land from which to have a real impact from the ground up in national and international process. This is exemplified by the agendas of sustainable cities in Peru, Ecuador, Argentina, Mexico and Brazil.

All of the above confirms that Latin America and the Caribbean have the chance to exit the circles of

underdevelopment, inequality and environmental unsustainability they have been caught up in for decades.

Without re-assessing the urban development model there is a huge risk that cities in the region could return to the ghosts of their past given that the challenges they face are on a grand scale.

### 3.3. Suggestions and ideas to speed up efforts

#### Coordination

Although there are a large number of initiatives related to sustainable cities in LAC, the important thing is that their efforts are coordinated and not in isolation, which means they need to have a suitable institutional framework in place on a national level. For instance, national programmes for sustainable cities could be considered, where environment ministries play the role of facilitator and coordinator in sub-national processes, carried forward by local governments that coordinate with the relevant actors in order for everyone to articulate their efforts towards a common goal.

One example of how this might work can currently be found in Peru, where the Ministry of Environment promotes an agenda of sustainable cities that forms a key part of national planning on climate change, and is adopted in their Intended Nationally Determined Contribution (INDC). Therefore, their efforts are addressed on a sub-national level in order to reach a target and fulfil a national commitment. Furthermore, the emergence of national programmes for sustainable cities in the region could enable efforts to be coordinated between cities in one country, in different countries and between programmes that are hubs in a regional network with blocks of common targets.

#### Funding

At the present time there are expanding international funds devoted to climate funding, for instance the Green Climate Fund, which aims to have one hundred billion dollars annually from 2020 onwards. Nevertheless, the channels to ensure funding reaches cities are not necessarily being established with clarity and often require backing from national governments, which is regularly a political-type barrier to funding. To date, the mechanisms of climate funding have not sufficiently adapted to the complexity of the urban environment; however, a transition is under way with more flexible and accessible mechanisms.

AFD (2014) have mentioned some emerging funding mechanisms for local authorities, for instance:

- Inter-governmental subsidies and transfers. Financing or co-financing for urban development that is generated through the taxpayer and received via the central State is still, in Latin America, one of the main funding sources for local governments and diminishes the level of autonomy for local authorities. This often results in public investment funds managed by the central government.
- The mobilisation of capital and financial markets. To diversify their sources of financing, Latin American local authorities are looking for funding in capital markets, whether it is through bank debts or directly via bond issuance. The international finance institutions that are active in Latin America, for example IDB, BM, CAF, AFD, JICA, KfW, offer long-term loans with reasonable interest rates and are generally work towards funding specific projects. Nevertheless, the majority generally only offer loans in foreign currencies (with the resulting exchange rate risk) and require a guarantee from the national State. The result is that it does not boost local authorities' autonomy. Ideally, opting for debt in local currency limits the exchange rate risks and, therefore, leads to safer practice. The spread of a loan "culture" and the risk control it involves, along with the development of a complementary offer between public financiers (IFE, IFI), private banks and capital markets could generate a virtuous circle of development for local public debt.
- Fiscal policy and capital gains tax. The financing of urban development can be supported by the capital gains tax generated in the development of the city. This withholding of taxes could be carried out on a stable and recurrent basis (property tax), or on a one-off basis. Property tax is the local tax par excellence and, theoretically, is directly linked to urban development and land value. However, in Latin America transfers represent a significant part of municipal income, which means there is no incentive to try to optimise the collection of property tax. The valuation of added housing tax also constitutes a significant innovation in Latin America. This instrument, known as Participation in Capital Gains in Colombia, Special Contributions to Capital Gains in Venezuela and the Return to Valuations in Uruguay, involves taxing personal property to benefit a legislative change or the construction of a public work. Developing these local fiscal instruments would enable more operational public urban planning, a more balanced partnership with the private sector and a better distribution of the costs and capital gains in urban planning.

- **Taxes for users.** The payment of part of the urban public services by users results in a significant source of financing for urban investment, whose circulation is widely supported by international institutions. The resources that correspond to the fees paid by users are a way of guaranteeing an ongoing revenue stream for local authorities in charge of public services in urban areas. This income also enables the complete or partial financing of the operation, as well as strengthening the solvency of public administrations with the aim of achieving complementary financing. Therefore, a reference is often made to the success of a company like the Public Companies of Medellín, which has been able to balance its books through the efficient management of taxes and the fees paid by users of services such as water, gas, electricity and telecommunications. This success is mainly down to the autonomy that these companies have achieved in relation to the political impact and implementation of strategies, for example to include the cost of investment in the calculation of fees. Beyond the whole financial considerations, the rating of local public services also leads to greater awareness and responsibility for users with regard to the cost of urban development.
- **Partnerships with the private sector.** According to the terms of the World Bank, a public-private partnership can be defined as a “long-term contract between a public entity and a private company, through which the private company commits to providing a global service that combines the funding, capacity, implementation, development and maintenance of a public infrastructure. The private company is remunerated through fees which are paid directly by users, whether through payments from public entities, conditioned by the level of the service, or by a combination of both.” Mobilising capital and private operators for the operational implementation of urban development, in the form of a concession, public service office or other types of Public-Private Partnership, varies according to the Latin American country (this is mainly used in Brazil, Mexico, Chile, Colombia and Peru). Yet when the most significant APP investments are concentrated in the energy industry and inter-urban transport, for instance from 1980 to 1990, there is a visible general trend towards greater private participation. Barriers impeding the implementation of these mechanisms could be: the insecurity (legal, financial, political) of long-term contracts; the lack of grantor authorities’ technical capacity to draw up, negotiate and monitor the execution of the contract; public and political opposition to the “privatisation” of essential services like water and waste.

### *Standardising measures*

There is an overriding need to standardise measures that form the basis of sustainable urban planning. In terms of mitigation, the figure is clear following the development of GPC<sup>5</sup> methodology, its set-up as a pilot programme in 2013, the feedback that enabled the second version to be developed, and its launch as official methodology to measure inventories of GHG emissions in cities in 2014 during Climate Week NYC – within the framework of the launch of the Covenant of Mayors – and COP 20 in Lima.

With adaptation, the standardisation process of measures has progressed at a slower rate. Even though many LAC cities acknowledge the potential impact of climate change, and have identified the main risks in jurisdictions and have plans to tackle them, these efforts are far from homogenous and comparable. This is why the methodology put forward by the Covenant of Mayors for adaptation issues (see figure below) covers an important gap in terms of facilitating a common framework for measuring and reporting that enables resilience-based planning and the implementation of actions for cities.

Similar to the new international regulation of cities and climate change, the Covenant of Mayors allows adaptation measures to be standardised, essentially requiring a report on the threats as well as a vulnerability analysis, which leads to an Adaptation Plan for cities.

### *Training*

As well as standardising measures, there is also the need to generate capacities in local governments to be able to carry forward sustained processes that verify how targets are met. It is important to consider that the current administrations’ political cycles are short term and, consequently, very different from environmental cycles, which means planning must be carried out to overcome frequent barriers such as high staff turnovers.

The institutionalisation of managing low-carbon, climate-resilient development processes is the first step to ensuring their sustainability. This, therefore, involves making mitigation and adaptation to climate change issues more mainstream in public management instruments such as development plans, local regulations and standards, whilst also positioning them in national political frameworks. As a result, budget allocation can go towards activities such as staff training.

It is also important to stabilise procedural and municipal information systems, and systems to

5. Global Protocol for GHG emission at community level.

gauge and report measures. The experience of the Cities Footprint Project <sup>6</sup> in La Paz (Bolivia), Quito (Ecuador) and Lima (Peru) demonstrates that this was one of the main lessons learned.

Along with greater financing for urban development, the problem of the lack of technical capacities inside local government to design, implement and monitor activities must also be addressed. Developing programmes such as the World Bank's City Climate Planner or IBD's ICES point to the creation of capacities in order for local governments to acquire debts and carry out appropriate fiscal management that aims to fund the transition towards sustainable development models.

## 4. CONCLUSION

The first urban transition in Latin America and the Caribbean has been completed. Now, with almost 80% of the urban population living in cities there is a need to change the current urbanisation model and consider the new challenge of attaining more inclusive and more sustainable urban centres with more public spaces and designed more for people (UN-Habitat, 2012).

Within the context of new urban spheres, we can assert that in Latin America and the Caribbean conditions are being defined for a new urban transition, both in reference to resources and capacity, creativity and the political volition of local and national governments.

In order to advance towards more sustainable and more compact cities equipped with urban areas that have greater mobility and greater energy efficiency, there is a need to reassert collective interest in urban planning, work on policies of social and territorial cohesion, on national urban policies, and apply legal and institutional framework reforms.

Improvements to LAC cities take place on various fronts, such as the link to informal settlements/the marginalised population, and an infrastructure

network providing waste collection, water services and sanitation.

To improve sustainability issues in LAC cities, focusing on territorial planning is key, with a comprehensive and unifying vision under a governance logic and framed within international, national and local priorities. In other words, breaking away from the compartmental logic in traditional sectorial planning (water, energy, waste and sanitation), to find both horizontal and vertical integration. A city must be understood as a whole, where jurisdictions that compete with each other are an enemy to urban sustainability.

Despite the fact that there are numerous examples of success stories in sustainable urban planning in the transport, waste, energy and water sectors, certain conditions are required for these efforts to take root and for them to be replicated in other cities, for instance: the coordination of efforts in establishing frameworks that advocate the development of local initiatives; greater access to climate funding for cities; standardised common measures for sustainable urban planning; and the transfer of local governments' capacities for territorial management that deals with the problems caused by rapid urbanisation in the region.

The international situation fosters the strengthening of local initiatives through initiatives such as the Covenant of Mayors and the Mexico City Pact, which, in providing institutionality to cities' global movements, allow efforts to be coordinated around common goals. Moreover, the clear inclusion of cities in the Sustainable Development Goals and likely in the future global agreement on climate change are factors that act as a catalyst in this process.

Particularly in LAC, environmental sustainability can represent a vehicle for reaching higher levels of prosperity and overcoming major present-day problems – sustainable cities are more productive, competitive, innovative and prosperous and facilitate environmental preservation, as well as a better quality of life and well-being for people (UN-Habitat, 2013). This is possible when social and environmental objectives are integrated into cities' economic targets. ■

6. [www.huelladeciudades.com](http://www.huelladeciudades.com)



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# Sustainable cities in Latin America

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