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American States

Sustainable Cities: Defining a development horizon, seeking to extend the limits of adaptability

By Alejandro Martínez and Pablo González [1]

"Cada ciudad con 800 mil o un millón de habitantes, genera su propia zona prescindible, compuesta por esa 'gente sin oficio ni beneficio', en el filo de la navaja entre la sobrevivencia y el delito"

"Every city with 800 thousand or a million people generates its own expendable zone, consisting of those 'people without skill or benefit', on the edge of the knife between survival and crime"

Carlos Monsiváis, Mexican writer, journalist and political activist
(1938-2010)

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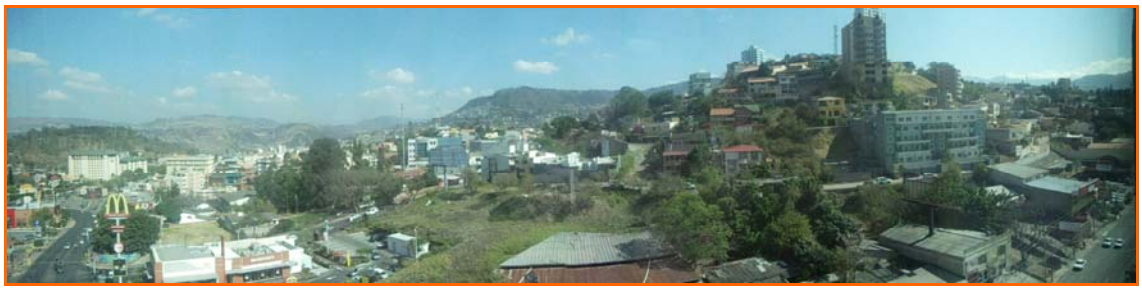

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Introduction

The concept of sustainable cities is not a new one. However, in the last twenty years, given the rapid urbanization processes and changes in consumption patterns in the Americas, urban planners, policy and decision-makers, as well as the international community have placed a high priority to this issue. This has resulted in studies and initiatives aiming to achieve the sustainability of cities. And within this broad concept, many have placed emphasis in public transportation and mobility, disaster risk reduction, and renewable and clean energy, while others in energy efficiency public buildings and waste management and recycling, among many other solutions.

Recognizing that the concept of sustainable cities has evolved around these priorities and solutions, there doesn't seem to be a general consensus on what a 'sustainable city' is, and instead the definition is subjective to each particular city and its context. For example, in the city of Medellin, in Colombia, with the slogan "The most educated", improvements were made in educational infrastructure, developing the concept of library-park, while implementing a new affordable public transportation system. Another example is the Federal District in Mexico, which with the slogan "Where people are the most important", the city government made significant improvements in pedestrian access with wide, obstacle-free sidewalks, as well as bike lanes and a bike shared program for integral transportation. These policies and actions have contributed to reducing CO_2 emissions and air pollution, resulting in a significant decline in cases of respiratory disorders or illnesses. In addition, they promote the preservation of historical monuments; enhance the beauty of the city, which in turn increases tourism and associated revenues; and improves physical fitness and mental health of their inhabitants.

This paper will not attempt to define sustainable cities, but instead will try to describe the main issues that cities are facing today or may be facing in the near future, so as to identify a suit of solutions that urban planners, policy and decision-makers may choose to

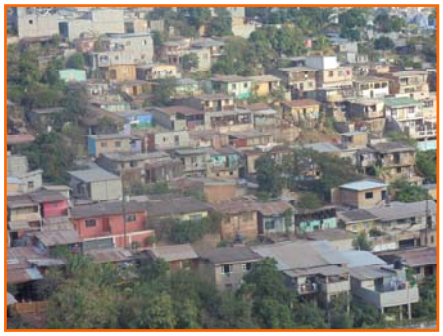
apply depending on the particular city and context. And in doing so, we will look at cities and associated territories as 'systems', and will try to describe some of the most common issues that are hampering their ability to perform their functions and to provide the services and goods that today and future generations require.

While addressing these complex issues and offering some solutions, we will be mindful of the internal and external drivers of development –not always predictable and often changing, that demand not only a vision expressed in long-term policies and development plans for a given horizon of 20, 50 or 100 years, but also monitoring systems capable to identify adaption strategies and measures to cope with the changing conditions and environment. We will be mindful also of the limits of a 'system', beyond which adaptation is no longer possible and drastic decisions and changes may be required.

Lastly, based on the description of the issues and possible solutions, the paper will offer a suit of strategies that may guide urban planners and policy and decision-makers in the monitoring of their 'systems' and in selecting the appropriate solutions.

Urban Context in the Americas: Compromising the integrity of the system.

The cities of the Americas are experiencing dramatic changes, which are compromising their integrity, affecting negatively their functions. The accelerated population growth and changes in consumption patterns are hampering the ability of cities to provide for today's needed services and plan for tomorrow's generations. According to the United Nations, population in Latin America and the Caribbean (LAC) has increased 3.5 times in the last 60 years, from 167,626 in 1950 to 593,697 in 2010, and the urbanization rate has doubled from 41% in 1950 to 80% in 2010.



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Cities have developed at the mercy of the housing market and short-term decisions are jeopardizing their long-term sustainability. Nowadays, city centers are used almost exclusively for offices and businesses, and just a few spaces are devoted to high-cost residences. At the same time, a growing sprawl is resulting in invasion of natural ecosystems and croplands, and the settlement of people in natural hazard prone areas, such as low coastal areas, flood plains and steep slopes prone to land and mudslides. Low income settlements are then located on the peripheries of cities, where the value of the land is low due to lack of basic services and their exposure to natural hazards. In many

cases, this situation is exacerbated by a vertical growth of housing, which in itself may not be a problem or may even be a solution; but with no consideration to building codes, water and sanitation requirements, and electricity it poses new challenges. Poor accessibility and precarious constructions add to create an environment highly hazardous to human health and public security.

This unsustainable urban context is completed with a collapse in the infrastructure of all systems for water and sanitation, electricity, gas, communications and transportation. As population grows the demand for those and other basic public facilities, such as schools, hospitals, and other educational and health units increases, so does that for security facilities and open areas for recreation.

Other common rising problem is mobility. As the city spreads out around the periphery, commuting distances increase, as does the demand for public transportation. In the mean time, motor vehicle dependency has resulted in the outburst of the automotive fleet. The resulting air pollution, combined with a lack of green areas capable to produce oxygen and sequestrate carbon dioxide and other gasses, are causing respiratory and cardiovascular disorders. Confined public spaces and congestion, on top of lack of recreational areas, result in high rates of obesity, mental stress and numerous other disorders.

The landscape of the city, with no defined architectural styles, differences in the height of buildings, and the mix of incompatible uses (i.e. industries in residential zones without buffering areas), further affect the functions and integrity of the city. The accelerated loss of green areas due to the construction of new buildings changes runoff rates, with increasing risk for floods, while breaks the balance between population density and green areas. The more population a city has the more green areas the city needs for health and recreation.

When urban sprawl encroaches on forests and other natural areas, the city loses its reserves of biodiversity, oxygen, clean water (affecting ground water replenishment, rivers, creeks and others), and natural landscape. And it also promotes the creation of urban heat islands, which in turn introduces dramatic microclimatic changes and increases the demand for energy during extreme temperatures.

When urban sprawl reaches rural areas with croplands, in addition to the problems above mentioned, local sources of food are diminished and a dependency on imported food is created. In turn, food prices increase, as do unemployment, poverty rates and migration from rural areas to the city. A vicious circle is then created that in the end results in increasingly loss of quality of life.

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All the issues described can be addressed by establishing a development vision for the city, which incorporates sustainable consumption patterns and an adequate distribution of population, among other strategies. It will be only then when cities, their governments and all segments of the society –private enterprises, grass root organizations, etc., will be able to establish policies and plans capable to preserve the integrity, functions and goods of the 'system' –city, periphery and rural areas. And they will also have to be able to respond to external changes from national, regional and global policies and economies. Yet, we must recognize that all systems have a limit beyond which adaptation is no longer possible, making the development of a vision, and a clear policy and plan to realize it the critical element of a sustainable city. A national policy that fosters decentralization and strengthening of local governments, as well as participatory processes that can ensure transparency and accountability of all –not only of government agencies but also private enterprises, all organizations of the civil society and individual citizens, will provide for a better chance to realize that vision and adapt to internal and external changes.

Some Solutions: Working towards sustainable cities

On one hand, solutions must seek to increase the time for humans to react to a changing environment and conditions. On the other, they should aim to reduce the impact of these changes and increase the capacity of adaptation.

Cities around the world are unique, as they are defined by their natural environment, cultural behaviors, economic and productive conditions and context, their functions and attributes. This is the reason why solutions must be customized and there is no fit-all recipe. However, there are some basic common policy and planning elements that can be applied to all of them as a starting point.

The main action that must be taken by actors is to meet the vision of the city. This vision should be built on the basis of a social and political consensus, and with the support of well-defined government structures and functions capable to ensure its long-term implementation throughout changes of public administration. Policies on land use and occupation of the territory, economic and productive systems must follow and be well embedded in the democratic institutions, and sector policies and plans, and institutional policies and plans of private enterprises and non-governmental organizations and other stakeholders.

Planning and management of the territory –land use planning in consideration of environmental impact and risk assessments, is a vital element to enhance the health of a

city and its surroundings. Hence, this planning process must be accompanied by economic policies and measures that provide for incentives and facilitate its implementation.

Cities must be human scale. This means that the urban landscape influences the people's emotions and attitudes towards the environment. This is the reason why, the language of the city has to be made by an appropriate mixture of architectural styles, building heights, and a harmonic distribution of the different spaces and elements of the city. Moreover, a balanced blend of natural and urban landscapes enhances landmarks and reinforces the city's identity, improving or, some times, creating tourism attractions.

Likewise, infrastructure for mobility should be built using factors of integrated mobility such as: handicapped accessibility, and walking and cycling trails and paths for near by commuting. These factors have no CO_2 emissions and promote fitness and stress reduction. However, in order to provide transportation for longer commutes, they must be connected to public transportation.

Vehicular connectivity is also critical to mobility. This is due to the fact that cars are the main producers of CO_2 emissions, polluting the air, and driving is one of the main causes of mental stress. In addition, car dependency results in a decline in physical activity, which in turn worsens fitness and increases obesity.

There are fundamentals social and economic services that must be supplied by the city, such as: water and sanitation, gas, electricity, and communication. Increases in electricity demand call for the diversification of sources of energy to reduce the consumption of scarce fossil fuel and air pollution. Wind and solar power, hydro power, rainwater reuse, wastewater management and the treatment of waste as a resource (including e-waste, Reduce, Reuse, Recycle and Cradle to Cradle Technologies, methane production, etc.) are all alternatives that whenever available can provide for a suitable solution.

In order to achieve the city vision, some spaces must be reserved as buffer areas, areas highly exposed to natural hazards, or areas for conservation purposes or areas that serve as corridors for species of significant value. In addition, city growth limit should be defined taking into consideration the capacity for infrastructure, services, and public facilities that the city can afford. And the cities must be buffered with rural areas, without disconnecting them from each one.

Until now we have explained some of the critical aspects, functions and attributes that cities must meet, but we cannot neglect the relationship between urban and rural areas, and the need to provide rural areas with technology, knowledge, services and facilities,

and occupation and sources of income. This will help regulate migration patterns from the rural areas to the city and prevent the emergence of low income peripheral human settlements, outside the city growth limits. At the same time, it will provide the city with food, regional produce, and raw materials, ensuring the integrity of the 'system'.

In addition to these aspects, functions and attributes that the system must meet, there are several key policies the government must implement in order to have a healthy system capable to adapt to a changing environment and conditions.

One of the most important is a sound public participation strategy. The city vision and other policies and programs have to be designed by consensus, so as to ensure voluntary compliance of all. Gender-oriented policies capable to understand the different needs and conditions of men and women, girls and boys, and elders, as well as capitalize on their comparative strengths and capabilities will further improve the likelihood of achieving that vision, and consequently sustain the integrity of the 'system'.

Finally, information and knowledge exchange and sharing, as well as technical cooperation among neighboring or linked communities, cities and regions will improve the identification and performance of solutions.

Regional and global connectivity and good business relationships, in an increasing integrated world, will increase adaptation capacity to external and internal changes. Forums and dialogues for citizens to connect with others around the world will provide business incubators and accelerators, will promote e-business, and in the end will create better conditions for long-term sustainability. As global economy is volatile, diversifying economic activities becomes critical to the sustainability of a city. So strengthening local economies, diversifying companies and activities will also render considerable benefits in the long run.