PLANNING FOR CLIMATE CHANGE IN CARTAGENA, COLOMBIA: INSTITUTIONALIZING ALTERNATIVE APPROACHES

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ABSTRACT

Planning for climate change in cities of developing countries is a difficult task due to the lack of resources, low institutional capacity of local authorities and governments, and the informal and illegal growth of urban areas. This is worsened by the fact that the occurrence of extreme weather events and small incremental changes in climate phenomena is increasing and intensifying in these areas. This paper is a case study of Cartagena, Colombia. It seeks to identify how bottom-up approaches are incorporated or considered into its legal and institutional planning framework.

This framework is examined by revising associated planning laws and other documents, and through interviews with local planners, public officers, NGOs, CBOs, planning experts, academics, union members, private sector organizations and other key agents.

I found that there are programs, strategies and approaches that involve citizen and community participation in planning. However, training and education are

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required on how to participate in these processes and to increase awareness and associate extreme weather events with climate change effects and causes. In addition, public-private partnerships, such as that of the Comité Barriales de Emergencias (COMBAS) program, are recommended, as they have successfully managed disaster risk reduction by merging top-down and bottom-up approaches.

Key Words: Cartagena, climate change, urban planning, legal and institutional framework, adaptation, mitigation

JEL **Classification:** O21, Q58, Z18

RESUMEN

La planeación del cambio climático en Cartagena, Colombia: Institucionalizando enfoques alternativos

La planeación del cambio climático en los países en desarrollo es una tarea ardua debido a la baja capacidad institucional de las autoridades y gobiernos locales y a la expansión informal e ilegal de las áreas urbanas. Esto es agravado por el incremento en la incidencia e intensidad de eventos climáticos extremos, al igual que por los pequeños cambios incrementales en la temperatura que, a pesar de ser imperceptibles en el corto plazo, generan efectos considerables en las dinámicas climáticas mundiales. Este documento presenta un estudio caso de Cartagena, Colombia. Su propósito es identificar cómo las aproximaciones y metodologías que parten de abajo hacia arriba son incorporadas o consideradas dentro del marco legal e institucional de la planeación de la ciudad.

El marco legal e institucional de la planeación de Cartagena es examinado por mediante una revisión exhaustiva de leyes y demás documentos asociados a esta actividad. Este primer análisis es complementado con entrevistas realizadas a funcionarios de la Secretaría de Planeación de Cartagena, organizaciones no gubernamentales, organizaciones de base social, profesionales dedicados a la planificación urbana, académicos, gremios económicos, empresas privadas y otros actores claves.

Se encontró que existen programas, planes y estrategias que incorporan la participación comunitaria y ciudadana en la planeación de la ciudad. Sin embargo, es necesario implementar programas de educación y formación para así incrementar

la participación de los ciudadanos en estos procesos y generar conocimiento y asociación de causas y efectos relacionados con cambio climático. De igual manera, se recomienda profundizar y extender las alianzas publico privadas, tales como los Comités Barriales de Emergencias (COMBAS), ya que estas permiten combinar iniciativas de abajo hacia arriba con enfoques provenientes de arriba hacia abajo.

Palabras Clave: Cartagena, cambio climático, planeación urbana, marco legal e institucional, adaptación, mitigación

Clasificación JEL: O21, Q58, Z18

I. INTRODUCTION

Climate change is today a global phenomenon, as has been shown by different studies and institutions. The Intergovernmental Panel on Climate Change (IPCC) defines it as «a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer». These changes can be produced by the natural dynamics of the environment, external forces (i.e. volcanoes or solar activity) and anthropogenic changes affecting the atmosphere (IPCC, 2007a, p. 943).

Current debate on climate change focuses largely on urban areas, as the world's population increasingly lives in cities. According to UN-Habitat (2009), every year cities are increasing in size not only in terms of area but also in population. Since 2009 most of the world's population has become urban (over 3.4 billion people). The main reason for this is the displacement of people from rural to urban areas, which provide better living standards than rural areas. For instance, cities provide more opportunities in terms of education, jobs, quality of life and, in some cases, security (UNEP, 2002). The cities of developing countries will be the driving force of the urbanization process in the coming years; population projections for 2050 estimate that Asia will increase its urban population by 1.7 billion, Africa by 0.8 billion and Latin America and the Caribbean by 0.2 billion (UN-Habitat, 2009).

The urban poor are the most vulnerable to climate change, not only because they lack financial resources, adequate living conditions or political representation, but also because of the location of their informal settlements. The urbanization

process in most developing countries occurs in the periphery or in unauthorized city areas. Most of the urban poor, therefore, live in hazard prone places that are exposed to the impact of sea level rises, floods, low quality water sources and sanitation infrastructure (Winchester and Szlachman, 2009).

This implies that urban planners and local authorities are under great pressure to develop solutions for the constant growth of cities. Urban issues such as provision of housing, water and sanitation, education, transportation and infrastructure are the challenges that cities are facing (FIG, 2010). In addition, floods have become a major concern in recent years in these areas because most of the places where new city dwellers live are not prepared to deal with climate change and its consequences. The situation is worsened by the fact that most government and local planning authorities in developing countries are not able to cope with the problems of urban growth because needs are higher than their current capacity to provide solutions, as increasing numbers of people become city dwellers (Commins, 2011).

Planning in cities of developing countries is different from that in cities of the developed world. Segregation, poverty, informality, income deprivation, high levels of public sector corruption, economic and social inequalities, lack of infrastructure and exposure to climate change effects are problems of a greater scale in cities of developing countries. This implies that not only social and economic arrangements are different, but also that institutional dynamics differ and require new approaches, as procedures that work in cities of developed countries do not necessarily work in these contexts.

This raises the issue that planning in cities of developing countries involves two coexisting worlds: the legal or formal (found in laws, decrees, plans, statutory documents and government institutions) and the informal or «de facto» (working for those who somehow do not fulfill the requirements, are not taken into account, cannot access the system or their conditions and capabilities exclude them from legality).

Frequently, most planning policies and institutions in these countries are well structured, designed to work under «ideal scenarios», where citizens behave according to established rules and procedures. Reality, however, is different, as social arrangements, cultural context, government capacity, historical legacy and corruption affect how people relate and perceive institutions and the extent to which they abide by laws. Therefore alternative approaches are needed to solve issues affecting urban areas.

This paper is a case study of Cartagena, Colombia, and is focused on identifying how climate change issues are being addressed by the legal and institutional planning framework of a city of a developing country. Its emphasis is on identifying how bottom-up and top-down approaches are implemented in city planning. A review of the legal and institutional statutory documents and interviews with key stakeholders of city planning are used as the main sources of information for the analysis.

This paper is structured as follows: The first section is a review of the literature, including an analysis of current climate change debates and practices. The second section describes the methodology of the research. The third examines Cartagena's vulnerabilities, how the city is affected by climate change and the characteristics of its legal and institutional planning framework. The fourth section presents the results of the fieldwork and a discussion linking these results with the legal and institutional planning framework, to explore if and how bottom-up and top-down approaches for planning for climate change can be merged. The last section presents some conclusions.

II. THE LITERATURE ON CLIMATE CHANGE

This section reviews the current debate on climate change response. Since this is a case study of a city in the developing world, it also considers some of the literature on planning for climate change adaptation and mitigation in the context of the urban poor. The first part reviews the climate change debates; the second examines some current responses to this issue around the world.

A. Understanding the Debates on Climate Change Adaptation

1. Mitigation vs. Adaptation

The current debate on responses to climate change focuses on two approaches: mitigation and adaptation. There are several institutions defining these key terms in the context of climate change. The former is defined as «A human intervention to reduce the sources or enhance the sinks of greenhouse gases» (IPCC, 2007a, p.949). The latter is defined as «the adjustment in natural or human systems in

response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities» (*Ibid.*, p.982). According to the United Nations Framework Convention for Climate Change, examples of adaptation strategies are the construction of flood walls to protect low-lying areas or moving human settlements out of flood-prone areas (UNFCCC, 1997).

The management of the effects of climate change varies depending on the approach used. The first response is mitigation. This approach is related to addressing the causes of global warming, a method that focuses on reducing greenhouse gas emissions to the atmosphere. On the other hand, adaptation is focused on changing human behavior to deal with the effects of actual or future changes in weather conditions. The current political, academic and institutional debate is whether adaptation or mitigation should be the solution to reduce the negative impact of climate variation and extreme weather events. So the discussion can be summarized as: Should the frontline solution be to attack the causes or reduce the impact of the consequences? (McKibbin and Wilcoxen, 2003)

Those in favor of adaptation argue that the failure of international initiatives, the lack of political commitment from countries producing the highest amount of greenhouse gas emissions and the fact that how global climate will respond to changes in emissions cannot be fully predicted, increase uncertainty. Therefore, adaptation is the way to reduce climate change impacts (McKibbin and Wilcoxen, 2003). Reid and Huq (2007) support adaptation strategies for three reasons. The first is that the results from mitigation will not be seen immediately because some natural processes in Nature take time. Second, mitigation responses have been slow. Third, the effects of climate change are inevitable. As a result, adaptation is receiving more attention and acting as a substitute of mitigation as an approach to address climate change effects because they are being experienced today and now (Adger, Arnell and Tompkins, 2005).

2. Community-based Adaptation

Developing countries are the most affected by climate change due to the dynamics of urban areas. Because of unplanned growth of cities, urban dwellers in these countries are more exposed and face higher risks and vulnerabilities to extreme weather events, such as floods, storm surges of droughts, and incremental changes in temperature that affect climate comfort (Arambepola and Iglesias, 2009; Mallick, 1996; Olorunfemi, 2011).

The high rates of expansion of cities and urban areas impose a burden on local authorities and governments because most of them do not have the resources to provide services, infrastructure and economic opportunities to new urban dwellers (Commins, 2011). Most new city dwellers thus tend to live in informal settlements, where they are more exposed to climate change effects because they are more likely to find a place to live in the periphery or in zones that are more exposed to weather dynamics due to the lack of infrastructure or to the topography and geography of the area (UN-Habitat, 2009).

Due to the slow pace and results of mitigation responses and the increasing impacts of climate change, adaptation has been gaining more acceptance and recognition in the international agenda as an approach to cope with it and increase resilience, especially in developing countries. Recent planning efforts in developing countries are using community-based adaptation to climate change as an approach because it operates at the community level, taking into account local capacity, stakeholders and social networks to address the specific needs of communities (Ayers and Forsyth, 2009).

According to Jabeen, Johnson and Allen (2010) there are two types of adaptation: planned and spontaneous. While the former is related to strategies developed by the government or local authorities at the city level, the latter refers to a learning-by-doing process that takes into account historical experience and indigenous knowledge occurring at the community level. They conclude that both approaches can be articulated in order to provide an adaptation framework to reduce risk, exposure and vulnerability to climate change effects.

This «learning by doing» approach for climate change adaptation is used and encouraged by institutions such as CARE International and the International Institute for Sustainable Development (IISD). For these institutions this is a key approach to adapt to climate change because it «recognizes the unique risks faced by poor and marginalized people, as well as their essential roles in planning, implementing, monitoring and evaluating solutions» (CARE, 2010 p.4). Furthermore, a community-based adaptation framework must promote enabling factors such as climate resilient strategies, disaster risk reduction strategies, strengthening the capacity of civil society and governmental institutions, and empowerment and social mobilization to reduce the causes of vulnerability (CARE, 2010 p.12).

B. Further Understanding of the Planning Debates for Climate Change Adaptation

1.Participatory Planning and Community-based Adaptation

The current social, economic and political context of urban areas in developing countries requires innovative tools when planning for climate change adaptation. For instance, since the 1980s there has been a shift in rural area development (Chambers, 1994). This change involved a more decentralized bottom-up driven process where local people are empowered by making them an active part of the processes and outsiders' roles are limited to facilitate the procedure. This methodology, which was called Participatory Rural Appraisal (PRA), is «an approach and method for learning about rural life and conditions from, with and by rural people» (Chambers, 1994, p.953). This implies learning by using flexible methods, embracing diversity, sharing and encouraging information flows among different levels, the use visual tools and progressive learning (Moser and Stein, 2010).

Another important field where this approach and tools are being used is for planning for climate change adaptation in cities of developing countries. This methodology is particularly useful in these contexts because of the dynamics of informal urban growth. Moser and Stein (2010) argue that adapting participatory tools to each specific context and using them at the community level is an effective approach to capture qualitative and quantitative micro-data regarding how low-income groups are affected by climate change. At the same time the methodology provides an opportunity for communities to assess their vulnerability and identify solutions or interventions to reduce the impacts of severe weather based on their experience and knowledge (*Ibid*).

2. Planning for Climate Change in Informal Settlements

There have been a range of top-down and bottom-up methodologies, approaches and tools developed by NGOs, local governments, policy makers and research centres for planning for climate change adaptation in this kind of context. However, given the implications for governance, financial resources, planning procedures or legitimacy of providing solutions to areas where land tenure and property rights are a complex and multifaceted issues, official governmental support for climate change adaptation is lacking (IHC, 2011).

Nevertheless, this support does exist in some cities as NGOs, community-based organizations (CBOs), donors, the private sector and other national or international institutions provide assistance, programmes and strategies to enhance community-based initiatives (bottom-up) or develop new planning for climate change adaptation assistance (top-down) in a process that can be called informal or supportive planning for climate change adaptation (IFPRI, 2010; IHC, 2011; Agrawal, 2008).

Recently, bottom-up in addition to top-down approaches have been widely used (CIFOR, 2006, MacLean 2008, Mahiri, 2008). For instance, Moser, Norton, Stein and Georgieva (2010) introduced a bottom-up asset-based framework to analyze the vulnerability of assets and at the same time how they can be a source of resilience in poor areas. Their methodology has three elements: a participatory climate change adaptation appraisal – PCCAA – (to detect both, asset vulnerability and asset adaptation strategies), a rapid risk institutional appraisal — RRIA — (to «identify policies, programmes and institutions that constrain or facilitate the adaptive capacity of the urban poor» and a final process of consultation and validation of solutions where government, local communities, civil society and other key stakeholders participate.

3. Planning for Climate Change

Planning for climate change adaptation varies from country to country depending on the hazards and risks that the population faces. Developing countries face significant challenges regarding climate. According to the International Housing Coalition (IHC), the challenges of developing countries when planning for climate change adaptation are conditioned by a set of deficiencies related to the poor implementation of regulatory and planning systems, disaster resilience of housing stock, poor infrastructure planning and funding, and faulty land markets (IHC, 2011, p.8).

In contrast, planning for climate change in cities of developed countries occurs in a different context. These countries tend to have stronger financial, technical and human resources, institutional base, governments and civil institutions that provide enabling framework for planning for climate change adaptation (OECD, 2006; IHC, 2011). Under these conditions, investments in infrastructure, such as dams, rivers bank protection barriers or developing new building codes and materials, protection of green infrastructure and better use of technology for urban planning allow them to increase their resilience and reduce the exposure to the effects of climate change (PEER, 2009).

In Latin America, according to a report by the Massachusetts Institute of Technology, cities are engaged in planning for climate change adaptation (95% of them) using policies that tend to have links with «economic development, housing, migration and public health» (MIT, 2012, p.16). The strategy is to establish partnerships with NGOs for the development of strategic or general adaptation plans; this means that planning (adaptation, mitigation or risk management) for climate change in this region tends to be supported by these institutions. However, these plans are threatened by the fact that Latin America has the biggest income inequalities in the world (UN-Habitat, 2009), fast informal urbanization, lack of funding, staff allocation, low local support from the national level and the lack of institutional capacity and disconnected efforts that lead to plans that are based on oversimplified models of complex urban dynamics (Natenzon, 2007; Rodriguez and Bonilla, 2007). Therefore, the main challenges for the region are, first, to consider a holistic approach to urban planning (bearing in mind social, economic, political and cultural elements) to, second, overcome poor and socially-excluding urban planning implementation and reduce climate change exposure (BID, 2011).

Current debates and practices related to planning for climate change in developed and developing countries are, thus, varied. However, some patterns can be identified. Developed countries tend to rely on city-wide and metropolitan spatial planning and major infrastructure projects to tackle these problems (Planning and Climate Change Coalition, 2011, OECD, 2006). On the other hand, developing countries, usually have comprehensive city plans, zoning schemes and infrastructure projects, but the lack resources (human, financial and technical) and socio-economic (poverty and inequalities) arrangements increases their dependence on alternative approaches, such as participatory planning, NGO support and community-based adaptation to deal with the effects of climate change (Satterthwaite, 2007).

Blakely (2007) proposes the roles that cities should have under a climate change context. A review of common planning practices for climate change in urban areas around the world revealed that current practices are addressing the risk of climate change and developing risk profiles. However, the development of feasible, consistent and coordinated strategies for integrated macro and micro-scale adaptation is lacking and requires more support. In most urban planning systems there is a gap in the formal support of inclusion or mainstreaming of local and bottom-up planning for climate change initiatives. This gap not only represents

an opportunity to join planning at macro scale (country, region or city) and micro level (neighborhoods or communities), but also a way to formally (or legally) increase the participation of most of the population in an issue that is affecting the whole of mankind.

III. METHODOLOGY

Formal and informal (or «*de facto*») planning systems run in parallel and should be connected in order to improve not only the living conditions of dwellers of informal settlements, but also to support strategies focusing on reducing the exposure to the incremental effects of climate change on the population that lives in high risk and vulnerable areas of cities.

In order to understand how «*de facto*» and spontaneous climate change adaptation initiatives can be incorporated into the legal and institutional planning framework of Cartagena, Colombia, we used policy reviews and interviews with local authorities, private companies, NGOs and other institutions in order to identify how planning occurs «on the ground» and other relevant information regarding this matter.

Policy reviews involved a comprehensive analysis of the legal and institutional planning framework, local programmes and budget allocations. This was done by analyzing how the urban planning process occurs in the city and how key actors and institutions interact. The main sources of information for this are laws, decrees, acts, local development plans, institutional organization charts, statutory documents and other official planning and policy related documents. This analysis allowed a better understanding of how formal local planning works in Cartagena. On the other hand, «*de facto*» or supportive planning analysis was done with the information captured from semi structured interviews that were held with key actors. Three types of interviews were held:

Group 1: Local authorities/planners and local government officials. The purpose was to identify the perception of planning for climate change adaptation of people working in the legal planning framework and how supportive they as to the inclusion of informal or «*de facto*» initiatives and strategies into the system.

Number of interviews: 6

Group 2: NGOs and CBOs. The purpose was to identify the extent to which they are supported by local authorities and what these institutions are doing to support planning for climate change in the informal settlements of Cartagena.

Number of interviews: 2

Group 3: Professionals in the field, civil institutions, unions, private sector and academics. The purpose was to capture their perception about the legal and institutional planning framework, how climate change is addressed in Cartagena and to what extent bottom-up and top-down approaches are used when planning for climate change.

Number of interviews: 4

IV. CARTAGENA: CLIMATE CHANGE PLANNING POLICIES AND PROGRAMMES

The first section of this chapter presents Cartagena, Colombia, as a case study by discussing the socio-economic conditions of its population, administrative divisions, geography, its vulnerabilities due to climate change and its informal growth. The second section reviews the national and local, legal and institutional planning framework by discussing how laws, decrees, plans, strategies, programmes and institutions interact and provide a structure for city planning.

A. A case study of Cartagena, Colombia

1. General Information

Cartagena is the fifth largest city in Colombia, with an estimated current population of nearly one million (DANE, 2012a). Its condition as the largest Colombian port on the Caribbean and the fact that, recently, Colombia has signed various trade agreements with other countries, including one with the United States, are expected to give its economy an important boost in the coming years. These new trade agreements should encourage national and international firms to move to the city to take advantage of lower transportation costs and the possibility of building facilities with direct access to the sea. However, past economic growth in Cartagena has not increased living standards, reduced income inequal-

ities or enhanced social welfare (Secretaría de Hacienda de Cartagena, 2011). Also, local government has limited capacity to implement city plans and take on urban issues, such as informal urban growth and the provision of infrastructure for transportation and for climate change adaptation. Thus, Cartagena, a coastal city with surrounding bodies of water and a tropical climate all year round, is highly vulnerable to the effects of climate change (Alcaldía de Cartagena, 2011 and 2012a).

In recent years, because of these geographical factors, Cartagena has been experiencing significant and frequent flooding incidents caused by two main sources: extreme rainfall events and the rise of the sea level. What makes this city particularly interesting as a case study is not only its vulnerability and exposure to flood risk, but the fact that both high and low income areas are being affected by these events (Alcaldía de Cartagena, 2011).

2. Economy and Socio-economic Inequalities

The economy of Cartagena consists mainly of secondary and tertiary sector activities. Wholesale and retail trade activities, which represent 47% of the number of establishments, and manufacturing, 48% of total assets, are the main activities (Cámara de Comercio de Cartagena, 2011). Employment is concentrated in «wholesale activities, hotels and restaurants» (32% of the total) as well, while «manufacturing» activities – mostly concentrated in a petro-chemical cluster outside the city – represent 12% of total employment (DANE, 2012b).

Inequalities have been increasing in Cartagena. On the one hand, the economy is expected to boom for some years in the near future, led by increased international trade, expansion of the manufacturing base, more tourism and the expansion of port facilities. These sectors have been attracting foreign investment. For example, in 2008-2009 outside investment reached US$73,4 million and created 1,490 direct jobs and 3,080 indirect jobs (*El Universal*, 2010). Also, from 2008 until 2011, nearly US$267 million have been invested by new and existing firms located in Cartagena (Cámara de Comercio de Cartagena, 2011).

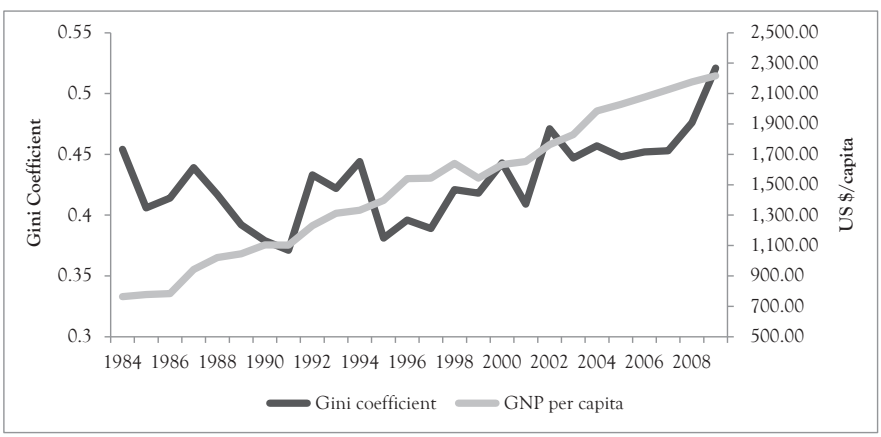
Nevertheless, the benefits of this have not been widely distributed. Rueda and Espinosa (2009) found that in 2009 the Gini coefficient for incomes in Cartagena was 0.52 and that nearly 70.7% of households were classified by local authorities as of low or very low incomes. Moreover, only 2.2% of Cartagena's households belong to very high income category.

In addition, Secretaría de Hacienda de Cartagena (2011) found an even more disturbing factor: although between 2000 and 2007 Cartagena had the largest increase (50%) in GNP per capita among the main cities of Colombia, at the same time the gap between incomes of the poorest (lowest quintile) and richest (highest quintile) households increased to 36 times. Also, the average personal income of the richest 1% was 124 times more than the poorest 1%. A long-run time series of the Gini coefficient shows an increasing trend in income disparities, beginning around 2000 (Figure 1).

3. Climate Change Effects

Overall, Cartagena has 193 kilometers of coastline, distributed around a group of islands, peninsulas and inner waterways on the Colombian Caribbean coast (Alcaldía de Cartagena, 2011). The climate is classified as tropical and semi-arid due to the weather dynamics occurring in the intertropical convergence zone, the trade winds and cold fronts from the northern hemisphere that affect the climate in the region (Espinosa y Rodríguez, 2012).

FIGURE 1
Cartagena: GNP per capita and Gini coefficient, 1984-2009

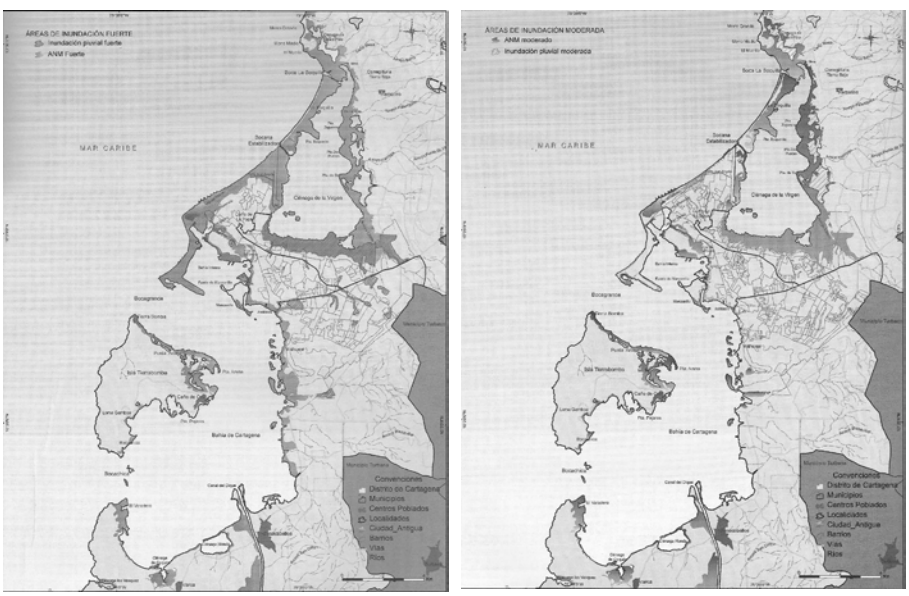


Source: Rueda and Espinosa, 2009, and Secretaría de Hacienda de Cartagena, 2011.

Two factors are affecting the city regarding climate change. The first is its geographic location; the second is associated with the informal urban development and growth of the city. The former means that Cartagena is very vulnerable to the effects of climate change due to its location at sea level and the geography of its territory that is mostly surrounded by water (a bay, a canal, swamps and the Caribbean Sea) (Alcaldía de Cartagena, 2010). Map 1 shows that these geographic conditions make the city vulnerable to floods that are caused by multiple factors and mechanisms, including the increase in the sea level, rainfall and a poor drainage systems (Invemar, 2012). Invemar, the Ministry of Environment marine and coastal research institute, has warned that climate change will increasingly affect Cartagena through floods, loss of coast line, loss of biodiversity, decrease in fishing and increase in diseases transmitted by mosquitoes (Invemar, 2012).

MAP 1

Flood-prone areas in Cartagena



Moderate flood scenario.
2019 forecast

Severe flood scenario.
2040 Forecast

Dark gray represent flood-prone areas

Source: Invemar, 2012.

However, the slow and incremental rise in temperatures is affecting urban thermal comfort and represents the most significant effect of climate change that the inhabitants of Cartagena experience. For instance, over the last half century the sea level increased by 22 cm at the coast; the average temperature of the city (28 ºC) has been increasing for the last 40 years; the average amount of rainfall has increased by 78 mm every 10 years and in 2004 and 2010 two extreme rain events occurred (Invemar, 2012).

The informal growth of the city increases its vulnerability because of the lack of infrastructure, provision of services, transport links, shelter quality and location of human settlements in hazard- prone areas. These conditions exist in many low-income and informal neighborhoods of Cartagena that are generally located close to water bodies (Caribbean Sea or Ciénaga de la Vírgen), on the slopes of La Popa hill or in illegally reclaimed lands close to Ciénaga de la Vírgen (Invemar, 2012). On the other hand, although high and mid-income areas are also located close to water bodies (Cartagena bay and Caribbean Sea) due to their social and economic conditions their resilience is higher and their vulnerability is considerably lower than other areas of the city. Higher income neighborhoods can better cope with these threats because of their financial resources, infrastructure, social networks and even political power or representation.

It is particularly important when planning for climate change in urban areas of developing countries to take into account inequalities and lack of capacities of local authorities to enforce planning laws and procedures (FIG, 2010). For instance, in Cartagena most households (54%) belong to the two lowest levels of the socioeconomic classification of the city (Secretaría de Hacienda de Cartagena, 2011). This means that most of the population faces great vulnerability as their neighborhoods do not have the appropriate conditions to face the impacts of climate change.

Providing appropriate climate change coping strategies for more than half of the households of a city is a major activity that requires not only resources, but also political will and the involvement of different economic and population sectors. Under these circumstances, city planning specifically for climate change is a governance and participatory issue. Should most of the population, then, wait for their local authorities and government to provide planning for climate change strategies or can communities and civil society provide their own solutions? The next section will discuss to what extent the latter is possible under the legal and institutional planning framework of Cartagena.

B. Policies to confront the effects of climate change

1. The National Context

In 1993, Law 99 created the National Environmental System (*Sistema Nacional Ambiental)*, which adopts and implements environmental policies, and the Ministry of Environment, which, with the Presidency of Colombia, elaborates environmental policies. These two organizations are in charge of sustainable development and the protection and management of renewable and natural resources.

Climate change policy was also incorporated into the national policy framework in 1994, when Colombia joined the United Nations Framework Convention on Climate Change. In that year, Law 194 was enacted to reduce and stabilize anthropogenic greenhouse gas emissions (República de Colombia, 1994).

In 2003 a Presidential Decree unified environmental, housing, urban and land development and use, management of natural resources and water and sanitation issues under a new Ministry of Environment, Housing and Land Development, in an attempt to provide a holistic approach to these issues. However, in 2011, this ministry was once again divided in two: a Ministry of Housing, City and Territory (*Ministerio de Vivienda, Ciudad y Territorio*) and a Ministry of Environment and Sustainable Development (*Ministerio de Ambiente y Desarrollo Sostenible*) (República de Colombia, 2003 and 2011).

Currently the Ministry of Environment and Sustainable Development has several strategies and policies, such as REED+, *Mecanismo de Desarrollo Limpio* (Clean Development Instrument) and the Kyoto Protocol supporting mitigation and adaptation for climate change (MinAmbiente, 2011). Also, the national government is preparing a National Climate Change Adaption Plan that incorporates land use and development planning under a three-pronged strategy: risk, environment and climate change (DNP, 2011).

More recently, in 2012, risk management policy for cities was addressed by Law 1523. This legislation determines that, through participatory approaches, communities must be active members of the National Risk and Disaster Management System and that risk and disaster management constitutes a planning tool for municipalities and, therefore, must be integrated within Land Use Plans (*Planes de Ordenamiento Territorial* or POTs) (República de Colombia, 2012).

In 1997, Law 388 regulated national, departmental, metropolitan and municipal territory and land use planning. This law established that city planning in

Colombia follows a zoning approach. This implies that each area of the city has a set of uses (for Cartagena they are: residential, commercial, industrial, institutional, touristic, and port activities, that range from permitted to totally forbidden depending on geography, future land uses, economic, cultural or social interest (República de Colombia, 1997).

At the city (municipal) level, plans must be drawn considering wider area plans (i.e. departmental or national policies) using POTs, which means that city planning in Colombia is based on a coordinated multi-level zoning system. Urban plans must also incorporate environmental and climate change issues into city zoning, through consultation and coordination with the Ministry of Environment and Sustainable Development.

Communities and civil society should also, according to Law 388, enacted in 2007, have a voice in the preparation of a POT. This is a requirement in the process of preparation, consultation and final disclosure of the plan. Also, when elaborating a *Plan Parcial* (Partial Plan), plans for specific areas, communities have an active role in city planning as they can submit proposals following the criteria and standards established in the respective POT (República de Colombia, 1997).

The national government has also adopted several additional strategies for climate change adaptation (IDEAM, 2012):

- Integrated National Adaptation Pilot, INAP: This program is focused on protecting moorlands, insular and coastal areas and prevents and reduces malaria risk by integrating biodiversity and adaptation strategies at local level.
- Strengthening institutional local capacities for risk management and climate change adaptation in the Caribbean: The objective of this strategy is to reduce the risk and exposure to hazards that the Caribbean region of Colombia faces due to its institutional, financial and technical weaknesses and geographic location
- The other two main strategies at the national level are the Integrated Regional Plan for Climate Change (*Plan Regional Integrado de Cambio Climático* or PRICC), which seeks to strengthen national and regional climate change planning capacities of the capital region of Colombia (Bogotá and Cundinamarca), and a regional strategy that integrates climate change adaptation into the Colombian massif ecosystem to reduce the impact on water resources.

2. The municipal context

At the municipal level, the main planning authority in Cartagena is the Secretary of Planning, who is responsible for land use management, urban control, management of city information systems and designing public investment policies (Alcaldía de Cartagena, 2012b). The main tools for city planning in Cartagena are the POT and the Development Plan (*Plan de Desarrollo*). While the former establishes a long term (ten year) vision, strategy, and zoning of the territory, the latter comprises a set of programmes, strategies and specific goals, ranging from a medium to a short term timeframe that represents the city mayor's government program during his or her four-year term of office. In addition, planning policies and laws in Colombia establish that development plans and POTs must be compatible and complement each other, so that the former must turn general strategies from the POT into specific and concrete actions (República de Colombia, 1997).

Three institutions work on problems of climate change and the environment in Cartagena: the Autonomous Corporation of the Canal del Dique (*Corporación Autónoma del Canal del Dique* or Cardique), the Public Environmental Institution (*Establecimiento Público Ambiental* or EPA) and the Oceanographic and Hydrographic Research Center (*Centro de Investigaciones Oceanográficas e Hidrográficas* or CIOH) (Espinosa and Rodriguez, 2011).

Cardique is responsible for managing the environment, renewable resources and the sustainable development of the territory. Though an autonomous institution, it follows and implements national policies established by the Ministry of Environment and Sustainable Development. EPA, on the other hand, has the same functions as Cardique but is limited to the urban area of the city. The last institution, CIOH, is a local research organization within the Colombian Navy that studies and measures weather variables and meteorological phenomena (Espinosa and Rodríguez, 2011).

As to governance and planning, beginning in 2004 the Mayor's Office incorporated decentralization, participatory tools and city planning into Cartagena's legal planning framework. Each locality must have a mayor and, among other functions and duties, he or she must encourage training of the community in governance and environmental issues, promote and support communities' initiatives and participatory city planning. In addition, it establishes the functions of Local Management Boards (*Juntas Administradoras Locales*) and Local Development Funds (*Fondos de Desarrollo Local*) as two main tools for enhancing decen-

tralization and supporting local planning in communities (Alcaldía de Cartagena, 2004).

a. Planning drainage systems: The *Plan maestro de drenajes pluviales*

The local government in Cartagena has also developed a Stormwater Management Master Plan (PDMP) and Climate Change Adaptation Pilot Plan (CCAPP) as strategies and infrastructure projects to increase the resilience of the city.

The former, the PDMP, which was first introduced in the POT of 2001, focuses on providing adequate infrastructure for the disposal of runoff water, rainfall and wastewater. In recent years, due to the effects of extreme weather events this plan has been viewed as one of the strategies to reduce the exposure of the city to the impacts of storm surges, inadequate water disposal and sea level rise, which are occurring with increasing frequency (Alcaldía de Cartagena, 2010). This plan comprises a major infrastructure city-wide project with an estimated cost of US $149 million which was developed to solve issues related to the unplanned drainage system of Cartagena, a city where 71% of the population and 69% of households are under flood risk due to the informal expansion of the city that did not follow local planning policies. In addition the plan identifies six critical issues related to floods: inadequate garbage disposal, rapid urban growth, sea level rise, sediments in water disposal canals, changes in the natural pathway of drainage canals and construction of illegal settlements near water pathways.

b. Planning for climate change: The *Plan piloto de adaptación al cambio climático*

The Climate Change Adaptation Plan (CCAPP) is a strategy focused on including in the POT the impact of climate change in order to reduce the risks that extreme weather events can produce. The plan states that close to 21.6 square kilometers (3.1%) of the city is exposed to flooding, affecting nearly 227,000 people (a fifth of the population) by 2019 if the sea level continues to rise (Alcaldía de Cartagena, 2011).

Though CCAPP is one of the firsts initiatives in Colombia that attempts to incorporate climate change adaptation in an urban area, this plan is not finished yet. The institutions and civil society that participated in the process have only defined general guidelines for the definitive plan. These guidelines are: incorporate climate

change adaptation in the urban and rural development process; take into account infrastructure needs and incorporate adaptation into sectoral development to generate competitiveness; increase awareness, strengthen community response, capacities and resilience; reduce the impacts of climate change on health; preserve and restore ecological heritage; include the PDMP as a strategy to reduce the impacts of climate change in the city; strengthen institutional capacity and create a local climate change committee for Cartagena (Invemar, 2012).

c. POT and Development Plans

i. POT

After reviewing the legal and institutional planning framework, starting from the broad national level to specific local policies and bodies, we turn to an in depth analysis of the gap detected in the literature review: how the two main planning instruments from Cartagena, the POT and the Development Plan, manage climate change, community engagement and combining top-down and bottom-up approaches for providing solutions for the effects of climate change.

A review of climate change adaptation or mitigation strategies in Cartagena's POT 2001 revealed that these topics are lacking in the city's main planning document. Although it adopts policies for protecting the environment, natural resources, water bodies, biodiversity, sustainable development and risk management for floods, landslides, coastal erosion prone areas, the POT has no direct mention of climate change as a force that can potentially affect the city and its dynamics (Alcaldía de Cartagena, 2002). Since this plan was built by a public consultation and participatory methodology, this lack shows that not only local authorities, but also the inhabitants of Cartagena, did not perceive climate change as a potential threat at the time. This could have been caused by low levels of awareness, institutional capacity, lack of knowledge or because the impact of extreme weather events or slow incremental changes were not significant or considerable during that period (as this issue is not the subject of this research further analysis is required).

In spite of this, the 2001 POT included several policies for settlements located in hazard-prone areas, such as those near swamps, wetlands, mountains, canals and low-lying land. But the local government has not had sufficient institutional reach and resources to enforce these policies. Thus, there has been an increase in the population at risk in a context where extreme weather events are more likely to occur and increase in intensity (UTB, 2012).

As already mentioned, the POT, a plan that must be reviewed every ten years in the specific case of Cartagena, is the main land and urban planning instrument for Colombian cities. Cartagena's POT dates from 2001. Since then, several forces have been shaping the city's urban dynamics: the increase in activities associated with the port, population growth, the expansion of informal settlements, climate change and the occurrence and intensity of extreme weather events (Secretaría de Planeación de Cartagena, 2010b). This means that, in addition to what the law states regarding the ten year review, the city at present needs an urgent evaluation of its urban planning for the ten coming years. An important symptom of the city's institutional weaknesses is that the administration was not able to enact a POT in 2011 and has not been able to do so at the time of writing this document (November, 2012)

In reference to this process, in 1997 Law 388 established that when preparing and reviewing a POT, the process must engage as many sectors, civil society, institutions and communities as possible in all its stages. Secretaría de Planeación de Cartagena (2010b) states that, in fact, the process of reviewing the POT, that has been taking place in recent years, has involved over 1.300 people, 100 institutions and 42 workshops. This constitutes a channel for involving and empowering citizens for building together the city, shaping the neighborhood where they live and providing solutions for urban issues.

Development plans are the complement of the POT as they, every four years, establish medium and short term strategies, programmes, goals and policies for the implementation of long term guidelines contained in the pot. Development plans of the last three administrations of Cartagena, those of Nicolás Curi (2005-2007) Judith Pinedo (2008-2011) and Campo Elías Terán (2012-2015), have used different approaches for managing climate change, community involvement in planning and merging top-down and bottom-up strategies.

ii. Development Plans

(a) 2005-2007: Mayor Nicolás Curi

One of the overarching objectives of this development plan is citizens' involvement in governance by proposing participatory methods for decision-making and other processes where consultation is a key driver in the process. This materialized into the following strategies (Alcaldía de Cartagena, 2005):

- The creation and training of 50 COMBAS (emergency management neighborhood committees) to empower and increase resilience of communities when managing risk and disasters.

- Decentralization of power, procedures and planning by strengthening small government units in *Localidades*.
- Strengthening Local Development Funds (*Fondos de Desarrollo Local*) to support local planning and governance in Localidades (localities).
- Use of participatory approaches for budget allocation and when building and maintaining secondary roads within neighborhoods.

Regarding climate change and strategies associated with this issue, besides risk management, coastline infrastructure defense and isolated environmental projects, this plan does not include or mention any other strategy, plan or infrastructure project related to climate variability. Other infrastructure projects proposed in this Development Plan, like the Integrated Transport System Transcaribe, the Public Space Master Plan and a new beltway through poor areas located in the south-west of the city and next to the Ciénaga de la Vírgen, did not directly consider the impacts of extreme weather events or climate change effects.

(b) 2008-2011: Mayor Judith Pinedo

The main objective of this development plan was to build «a single Cartagena» by reducing social, political and economic inequalities that had led to the emergence of two parallel «cities» within Cartagena; a prosperous and dynamic city engaged with the world, and a poor, illiterate and forgotten city with considerable human and urban development problems (Alcaldía de Cartagena, 2008).

One of the general guidelines of this plan was to enhance citizen participation in governance, increase the decentralization of power and decision making, and the development of citizens' capabilities. Specific strategies and programmes regarding citizen participation in governance and planning were:

1. Creating a women's network to increase their participation in decision making processes.
2. Reducing urban illegal expansion by promoting and empowering communities, local leaders and Community Action Boards in strategies to address this issue.
3. Reviewing the POT of the city using participatory methods included in Law 388 from 1997.
4. Increasing citizen consultation and training for decision making to enhance their capabilities to provide solutions for local issues.

5. Using participatory methods for city planning and budget allocation.
6. Strengthening Local Development Funds in order to decentralize power and procedures and increase communities' capabilities by enabling them to prioritize and propose solutions for issues affecting them.

As to climate change, though there is no direct mention of this topic in the Plan, there are some programmes and strategies that can be viewed as responses to address this issue:

1. Including environmental education in public schools
2. A new risk and disaster management plan
3. The Stormwater Management Master Plan
4. Coastal defense works and infrastructure

Moreover, this plan includes the objective of promoting sustainable and competitive development of the city by considering its geographic location, its port, industrial cluster and cultural heritage as favorable characteristics for its development. However, there are no specific strategies to protect or provide infrastructure to increase the resilience and/or reduce the exposure of the city and its economic and natural assets to the effects of extreme weather events and climate change. Consequently this reduces the competitiveness of the city, as future investments would not be protected from the effects of climate change.

Likewise, an integrated transport system is included and complemented by other means of transport such as water, pedestrian and bicycle. Despite the fact that this strategy was not conceived as a response to climate change, there are some infrastructure projects associated with the transportation system (such as the Stormwater Management Master Plan, which enhances coastal defense and the cleaning up of swamps and other deteriorated waterways to improve the quality of the environment and public space) that may contribute to reduce the impact of extreme weather events.

The provision of adequate public housing for people living in areas at risk is another strategy proposed in the Plan that helps reduce the exposure of informal settlements to climate change. However, in 2010 the city's lack of institutional capacity and preparedness for climate change was laid bare when the area where new social housing was provided was flooded badly during the rainy season

c. 2012-2015: Mayor Campo Elias Terán[*]

The current Development Plan is focused on reducing social and economic inequalities and exclusion, two of the main issues affecting the city. For the very first time, a Plan has included a clear and direct strategy for sustainable development and climate change adaptation, in addition to risk management programmes (Alcaldía de Cartagena, 2012c). This means that local authorities and stakeholders involved in city planning have increased their awareness of this issue. More precisely, this involves the creation of three policies:

- Risk management policy. Includes coordinating the local Risk Management Committee with COMBAS (emergency management neighborhood committees) to increase the resilience of communities to extreme weather events and include community participation in responses and relocation of settlements under risk that cannot be mitigated.
- Environmental and climate change adaptation policy. This policy contains a set of programmes for managing the city's water ways, coastal defenses, actions to protect the urban environment, increase awareness and participation through education and supporting two very important plans: Climate Change Adaptation Pilot Plan and Stormwater Management Master Plan.
- Land Management Policy. This policy includes the process of reviewing the POT, which means that it constitutes an opportunity for communities and citizens to participate in city planning and bring forward their concerns and proposals, as Law 388 from 1997 determines that consultation and participatory approaches are a requisite of this process.

In addition, the Policy for Welfare and Good Governance includes programmes that are focused on using participatory approaches in city planning, strengthening and developing capabilities of Community Based Organizations (CBOs) and increasing Local Development Funds.

Another important policy that was introduced in this Development Plan was the Regional Integration Policy. This is a significant change in city planning, as

[*] In October, 2012, Mayor Terán left office indefinitely for health reasons. A new election for Mayor of Cartagena is scheduled for 2013. This means that the Development Plan could undergo revisions whose content cannot be anticipated.

it proposes several urban development projects that require coordination with other cities and municipalities within the Caribbean region of Colombia such as costal defense, watersheds, basins and other green infrastructure projects that require inter-city coordination.

TABLE 1
Cartagena: Development Plans Summary 2005-2015. Climate Change, Participatory Approaches and Opportunities for Merging Top-down and Bottom-up Strategies

	Climate change	**Participatory approaches**	**Opportunities for merging top-down and bottom-up approaches in climate change responses**
Nicolás Curi (2005-2007)	Focused on risk management	Introduced decentralization of power, procedures and funds. Strengthened Localidades (localities)	**Low** (Despite government decentralization increasing, programmes were mostly driven by local government and climate change strategies were nonexistent)
Judith Pinedo (2008-2011)	Isolated strategies that were not integrated as climate change responses	Increased Local Development Funds to enhance local planning. POT review process involved community consultation and active participation.	**Varied** (Local development funds received more resources to increasecommunity initiatives but climate change strategies were not consolidated)
Campo Elias Terán (2012-2015)	Clear strategies, policies and actions. Considerable awareness of climate change issues	Continues the reviewing process of POT and formulation of the Development Plan with active citizen participation and consultation. Introduced policies to increase community participation in Land Management processes.	**Considerable** (Guidelines to address climate change adaptation and mitigation are currently under development while community participation and consultation in this process -and in cityplanning- has been increased)

Sources: Development Plans.

TABLE 2
Cartagena: Summary of the Current Planning Framework, 2012-2015

Framework elements	Description
Budget allocations	Risk management: COP $12.900 million (US $7.166.664) Environment and climate change (includes Stormwater Management Master Plan): COP $256.722 million (US $142.263.333) Land Management policy: COP $17.515 million (US $9.730.556) Local development strengthening: COP $45.981 million (US $25.545.000)
Programmes	Climate Change Adaptation Pilot Plan Stormwater Management Master Plan COMBAS Participatory budget Environmental and climate change adaptation policy Local Development Funds Land Management Policy
Legal	Development Plans Land Use Plan (POT)
Institutions	Secretaría de Planeación Secretaría de Infraestructura Secretaría del Interior Secretaría de Educación Oficina Asesora de Servicios Públicos Corvivienda Consejo Distrital de Atención de Riesgo Establecimiento público ambiental (EPA) Oficina de prevención atención de desastres Centro de Investigaciones Oceanográficas e Hidrográficas (CIOH) Red Cross

Source: Alcaldía de Cartagena (2012c)

A review of national and local climate change policies and programmes that regulate city planning in Cartagena showed that there is an increasing awareness of climate change and use of participatory approaches in planning. Therefore opportunities for merging top-down and bottom-up approaches are considerable under current and developing legislation. Today's challenges consist of implementing and enforcing these regulations, given Cartagena's traditional lack of resources and institutional capacity.

V. FIELDWORK RESULTS, ANALYSIS AND DISCUSSION

This section presents an analysis of the legal and institutional planning framework and links it with the results of the interviews that were conducted with key actors regarding planning for climate change adaptation in Cartagena. The main objective of this section is to identify how planning instruments and procedures take place «on the ground», focusing on de facto climate change adaptation. Key actors and stakeholders were divided into three groups according to their roles in the city. Therefore different questions were asked in order to understand the dynamics among key actors involved in city planning and development regarding climate change strategies, actions and programmes.

A. Stakeholder Interviews

The interviews performed during fieldwork showed that:

1. Most of the actions of strategies currently being supported by different institutions and communities are more related to disaster risk management and less related to climate change adaptation in the long term.
2. Awareness of climate change between different groups is varied. While people from local government, academics and experts in the field identify the effects of climate on the city, some civil institutions, trade unions and CBOs associate this issue with disasters and risk management rather than small and incremental effects. Generally speaking, people from Cartagena do not clearly recognize or associate climate change effects with weather phenomena (CCV, 2011).

3. NGOs, CBOs, experts, civil institutions and academics think that current responses from local government are not enough. Some say that there have been some improvements in how the local authorities are thinking about climate change, but their main concerns are weak law enforcement and the lack of implementation of strategies, specific actions or infrastructure works that have been proposed as responses for mitigating or adapting to climate change and extreme weather events.
4. During the current planning juncture in Cartagena (review of its POT and producing a new Development Plan), citizen participation in different processes and engagement in governance have been satisfactory, according to civil institutions, NGOs, CBOs and unions that were interviewed. Interviewees from groups 2 and 3 stated that during consultation, prioritization and final discussion of planning documents their voices were heard and taken into account in the process. However, during the final discussion of the current Development Plan they felt that local government changed several sections of the text without consultation, affecting their trust in the current government and its institutions.
5. The main issue that all the interviewees identified as a climate change effect is flooding, because of the increasing levels of rain. This issue is worsened by the lack of proper infrastructure to reduce water clogging in the streets and a proper drainage system.
6. Civil institutions and NGOs have been increasing their support in the area of climate change. These institutions are focusing their efforts on people's capabilities and institutional strengthening for risk identification and management. Investment in infrastructure is not a common practice for these institutions because they require more resources and involve dealing with land tenure issues.
7. Industrial firms have been supporting risk management programmes such as COMBAS (emergency management neighborhood committees). This specific program merges top-down and bottom-up approaches for disaster risk management, as the communities receive training in risk management. After this, they start developing coping strategies and become members of the city's disaster risk management committee.
8. Cartagena is in the initial stages of the preparation of its Climate Change Adaptation Pilot Plan (CCAPP). Key actors in the city recognize that this plan is a step in the right direction towards adapting the city to the effects of

climate change, as it groups several isolated strategies and complements them using a holistic approach that combines city planning, climate change and major infrastructure projects. However, implementation, resources, technical capacity and enforcement are the main concern, as vital plans, such as the Stormwater Management Master Plan, have not started yet even though they were included in POT 2001, more than 10 years ago.

9. Local government actions are focusing on relocating low income settlements that are located in hazard-prone areas instead of providing infrastructure and services for reducing exposure in these areas. The opposite occurs in high income and tourist areas, where hydraulic works and infrastructure projects have been proposed to reduce their exposure to sea level rises and intense rainfall.
10. Among interviewees there is no clear association between climate change, heat waves and their impact on water and energy consumption. In addition, it is necessary to promote further research and new policies in order to increase awareness among Cartagena's inhabitants.
11. Local Management Boards are essential in neighborhoods, since they support communities on different initiatives, help ngos and other institutions to reach communities and also decentralize power, procedures and enhance citizens' capacity to influence planning. However, information and training on using programs and rights that communities have is required to increase their participation in public affairs.
12. Environmental authorities do not enforce laws to protect the green infrastructure or stop potential anthropogenic actions that have been happening in the city, such as granting planning applications to projects located in areas that must be protected in order to keep the balance and levels in inner water ways of the city.
13. Many experts and academics argue that the lack of planning and the informal growth of Cartagena are two significant elements that have been increasing the exposure and risk of the city to climate change effects.

B. Comments

Cartagena must speed up its climate change adaptation strategy in order to reduce its exposure. The lack of policies to deal with these weather phenomena

is increasing the burden on the city's treasury because most of the responses take the form of ex-post programs related to disaster risk management programs that tend to be costly, unsustainable in the long term and do not properly address risk and exposure.

Despite some hints of regional planning in the POT 2001 and in the current Development Plan (2012-2015) regarding green infrastructure, protecting natural resources and water sources and basins management, coordination among different municipalities and departments has been scarce. This situation has increased the risks related to water disposal, canals basins and watersheds in Cartagena, as swamps and the bay are the final destination of these waterways.

The most interesting proposal in the general guidelines for the new POT is the strengthening of community participation. In fact POT 2001 defined several partial plans for some areas of Cartagena. These planning instruments can be used by communities and civil society, considering a set of general land use schemes and wider policy frameworks, to shape and define policies for the development of specific areas of the city. Therefore, this constitutes an initial approach and an opportunity for bringing forward community-based proposals for local authorities to plan and provide solutions for issues affecting their neighborhoods.

The lack of institutional capacity to enforce strategies and solutions that are developed for any of the urban issues affecting cities of the developing world can be associated with a structural, deep and strong force that creates a vicious circle described as follows. The lack of capacity and resources of local authorities does not allow the implementation of policies to address urban issues. Due to this, urban issues start to increase in size and complexity, which requires the development of programs and strategies with more resources to address them. This ends up with the development of comprehensive strategies that exceed the capacities of local governments and, therefore, their implementation on the ground.

Under this scenario, cities cannot be driven just by programs formulated by local or national governments. It is necessary to increase the participation and involvement of communities and civil society not only in policy formulation and consultation, but also in the implementation of solutions for their own issues. This means that citizens' participation in planning, specifically for climate change, is a key condition to finding a balance between formulation, feasibility and results in policies. As cities are associated with living beings, where complex dynamics occur among its inhabitants, city dwellers must propose and, at the same time, implement strategies in a process of social responsibility for the common good and

welfare. Because of this, top-down programmes from the local government and bottom-up initiatives coming from citizens must be combined to address issues affecting not an urban area, but the people living there. This merging of programs from the local government and initiatives from the community can increase the success of policies (CIFOR, 2006).

The above implies that governance is a key concept in city planning. If this task is entirely delegated and controlled by local authorities in a context where institutional capacity is weak, implementation will not be successful. Therefore a citizen participatory enabling framework must be developed and promoted in order to reduce, in the case of planning for climate change, exposure, vulnerability and risk (Maclean, 2008).

After reviewing the legal and institutional planning framework of Cartagena and interviewing some of the key actors and stakeholders in the process, it can be said that participatory methods have increasingly been used by local government in the planning process. The legal and institutional frameworks in the city allow the incorporation of initiatives coming from communities (bottom-up); there is also an increasing interest in improving these mechanisms. However, the main issues of citizen participation in planning and, specifically, in providing solutions and strategies for climate change are the lack of capabilities of local people to access these planning mechanisms and the lack of interest of the population in participating in part of this process. The reason for the latter is the apathy of citizens to participate in processes driven by the public sector, as their perception of local government is that there are considerable levels of corruption and inefficiency. In fact, opinion surveys by Cartagena Cómo Vamos, an NGO, show that citizens have increased dissatisfaction levels with local government expenditure, the overall management of the city and some public institutions (CCV, 2011).

This is probably due, in part, to low education levels and unfamiliarity with public participatory processes. Because of this, several civil institutions and NGOs, such as the United Nations Development Program and CCV, have been developing and implementing programs to increase awareness of governance and the participatory process where citizens can express their concerns and proposals to shape neighborhoods, localities and the city where they live.

NGOs, civil institutions and the private sector have been key actors in supporting not only action on climate change but also in training citizens in several democratic participatory processes. This means that some (private) institutions have been «filling» public institution gaps in order to bring citizens closer to their

rights and promoting the mechanisms that two main planning instruments (POT and Development Plans) offer and contribute to join top-down and bottom-up strategies for city planning. Nevertheless, local authorities and institutions must start using these tools when planning for climate change adaptation and mitigation as large scale city-wide projects involve large timescales and resources while small scale solutions at community level can be easily implemented in the short term and be cost-effective.

One of the research questions we addressed is if, in Cartagena, there coexist two parallel planning systems for climate change. The interviews showed that, although there is a lack of citizen participation in governance and poor perception of people of local government, there have been efforts to provide an enabling framework where local authorities, communities, business, civil institutions, NGOs and other stakeholders can work together to provide a vision and solutions for urban issues. In other words, despite there being «*de facto*» or supportive planning system, which can be evidenced in informal settlements, and a formal planning system, a legal and institutional framework is introducing tools and approaches to bring closer top-down and bottom-up initiatives. This should eventually reduce the gap between the two systems to incorporate a more flexible yet planned way to shape the development and growth of the city.

VI. CONCLUSIONS

Cartagena is a city with complex urban dynamics. While its geographical position and historical heritage have been attracting important capital flows and foreign investment to the industrial, construction and tourist sectors, poverty and inequality have not been reduced. This affects the way urban growth occurs and contributes to the appearance of a dual city: a wealthy and thriving city and a poor Cartagena, driven by informality. However, there is a common situation that brings together these two cities: climate change. The rise of the sea level, increasing temperatures and rainfall, and flooding are affecting low and high income areas alike and all economic sectors.

The legal and institutional planning framework of Cartagena is moving towards a more open and participatory approach in different planning processes and stages. This contributes not only to increasing citizens' participation in governance, but also reduces the gap between the legal and informal planning systems, as people's

capabilities, knowledge and needs are included in guidance and policies (CIFOR, 2006; MacLean 2008; Mahiri, 2008). These kinds of changes are necessary in contexts where social, economic and political inequalities are high. By increasing people's participation in governance and in planning, urban issues can be better addressed, as multiple stakeholders help provide solutions (Moser and Stein, 2010).

However, there are important and large matters that need to be addressed in order to implement participatory approaches and reduce social, economic and political exclusion and stop the pace of informal urban growth in Cartagena. The first strategy that local government must implement is to train, advertise and build capabilities in communities in order to increase their awareness of their rights regarding participation in planning (Ayers and Forsyth, 2009; CARE, 2010). A second issue is building trust among citizens by, for example, fulfilling agreements and plans or showing how public expenditure is managed. This is required to increase people's participation in planning processes. The third — and most difficult — task is to work on building institutional capacity to enforce laws and policies (Natezon, 2007). If this element is not present, then the legitimacy of processes is uncertain and trust in local government is reduced.

Regarding planning for climate change, the city has been working on identifying and proposing solutions for this issue: two main planning documents, the POT and the Development Plan, contain strategies, programs, plans and actions to adapt the city to climate change. In addition, Cartagena is the first city in Colombia to develop a Climate Change Adaptation Plan that considers this issue with a holistic approach. An analysis of the legal and institutional planning framework, considering results from interviews with stakeholders and key actors in the process, reveals that there is a need to work on its implementation and turning the plan into action. Ayers and Forsyth (2009) argue that the process of adaptation to climate change, the quality of local knowledge and of local capacity and willingness to act are key elements. Cartagena should work on these fronts in order to reduce the impact of weather phenomena associated with climate change.

To conclude, the legal and institutional planning framework of Cartagena is going through important and crucial changes as a new development plan has just been approved and the POT is currently being revised. This planning stage has been used to incorporate several climate change adaptation, mitigation and disaster risk management policies and strategies to reduce the impacts of several weather phenomena and small incremental changes in climate. These planning documents (POT and Development Plan) include participatory approaches in

most of their stages and therefore issues affecting communities and their proposals to solve them. This means that the legal and institutional planning framework of Cartagena is starting to incorporate not only climate change responses but also bottom-up approaches as community consultation and participation in the process is considered. This eventually will reduce the gap between legal and informal planning systems (CIFOR, 2006).

Nevertheless, as a recommendation there is a need to increase and enhance communities' participation in the Climate Change Adaptation Pilot Plan by considering their local knowledge and capabilities (Reid and Huq, 2007) in order to adapt at macro level but also at the small neighborhood and household scale (Jabeen, Johnson and Allen, 2010). The support of NGOs, research bodies, international aid programmes and the private sector has been noteworthy for increasing awareness and participation of the population in planning debates and processes that have been taking place in recent years. It is recommended to increase this support as institutions that were interviewed revealed that communities learnt how to participate in city planning, local government took into account their proposals and at the end of the process their expectations were fulfilled.

As local government does not have the capacity to enforce most planning laws, an alternative strategy could be to increase people's participation in the planning system to incorporate small but significant adaptation responses identified by communities (CARE, 2010, Mahiri, 1998). Through public-private partnerships, the government must consider alternative and innovative approaches, such as extending or creating strategies, for example, COMBAS, to directly deal with climate change adaptation at the community level (Satterthwaite, 2007). This model has been successful in providing enabling factors (CARE, 2010) for managing risk through the co-operation of local government, the private sector, NGOs and communities and increasing people's awareness, education and capabilities.

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