



Interviews with experts from Montevideo, Uruguay and Cartagena, Colombia provided details of how climate change considerations have been successfully integrated into urban land-use planning. Practitioners from Africa, Asia and Latin America discussed how these and other methods might be adopted in their respective cities.

## INTEGRATING CLIMATE CONSIDERATIONS INTO URBAN LAND-USE PLANNING

### SUMMARY

Discussion 3 of the online learning exchange focused upon the value of integrating climate change considerations into territorial planning. Ignacio Lorenzo Arana of Montevideo, and Paula Cristina Sierra-Correa and Francisco Arias-Isaza of Cartagena shared unique experiences from their cities, both of which have successfully developed territorial climate change plans. Both Montevideo and Cartagena used participatory approaches in the development of city level climate change strategies, which enabled the implementation of context specific actions with high buy-in from the community. The involvement of a diverse group of stakeholders was crucial in managing expectations and identifying gaps in planning efforts. Learning Alliance participants reviewed these interviews and shared experiences with land-use planning from a variety of African, Asian and Latin American cities.





## Key Conclusions

The online learning discussion suggested the following key conclusions related to the integration of climate change considerations into urban land-use planning in African, Asian and Latin American cities:

- There is currently a lack of city level land-use plans that integrate climate change considerations because cities have other development priorities, and there is a lack of political will
- There is a general lack of local technical capacity to develop such plans and outsourcing to consultants often results in plans that do not fully consider the local reality
- Community involvement in land use planning processes can improve local awareness of risks and respect for land use regulations

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## Discussion: Integrating Climate Considerations in Urban Land-Use Planning

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### Learning Focus

Discussion 3 of the Learning Alliance on Climate Resilient Cities focused on integrating climate considerations into urban land-use planning. As exemplified by case studies from Montevideo, Uruguay and Cartagena, Colombia, Latin American cities are increasingly working on comprehensive land-use and territorial planning strategies that are supported by local policy and developed through participatory processes.

The purpose of this discussion was to identify whether cities throughout the global South are also addressing climate change issues within their land-use and territorial planning strategies. What is more, participants were encouraged to explore the appropriateness of the Latin American models in terms of addressing the distinct climate related challenges in their respective cities.

Discussion 3 was guided by the following two questions:

1. How are your cities addressing land-use planning issues in the light of climate variability?
2. How might an integrated interdisciplinary approach to land-use planning, such as those outlined in the interviews with our Latin American experts, help overcome specific challenges in your cities?

### Latin American Case Studies

For this discussion, two Latin American case studies were presented to the Learning Alliance participants: Montevideo's integrated territorial approach to climate change planning and Cartagena's integration of climate adaptation considerations into city land-use planning, with both cities using a multi-sector, interdisciplinary and participatory approach to planning.

In order to provide direct insight, interviews were carried out with key actors involved in the development and implementation of these plans. Ignacio Lorenzo Arana of Montevideo served as Adaptation Advisor to the UNDP Territorial Approach to Climate Change Project for Metropolitan regions in Uruguay, and Paula Cristina Sierra-Correa and Francisco Arias-Isaza of Cartagena work as Programme Coordinator and Director General at the Marine and Coastal Research Institute (INVEMAR) in Colombia. INVEMAR was responsible for leading the integration of climate considerations into Cartagena's urban planning strategy. Both interviews are provided at the end of this document.

### Discussion Participation

Seventeen countries were represented in this discussion - 7 African, 5 Asian and 4 Latin American - with contributions from some 43 participants.



## Summary

On the whole, participants felt that climate change considerations are yet to be fully integrated into land-use planning. Some participants mentioned that land-use planning is incipient or ineffective in their cities regardless of climate issues. Some participants from cities with effective urban land-use planning, explained that environmental concerns are included in plans to a certain extent, but climate change challenges as a whole are not yet incorporated. Other participants shared details of land-use plans that do seek to address climate challenges to varying extents.

Cities with land-use plans that do not integrate climate consideration include Dhaka, Bangladesh, where there is a focus on environmental issues such as pollution; Harare, Zimbabwe, which does have plans for zoning and upgrading urban settlements, but with no specific mention of climate challenges; and Kathmandu, Nepal, with risk sensitive land-use planning.

*“Land-use planning in the light of climate change variability in Bangladeshi cities has been given very little attention but urban environment aspects have been covered a lot. All development authorities and many paurashavas have prepared and implemented structure plans, master plans, urban/ward area plans and detailed area plans. These plans have addressed zoning and overlay controls by incorporating physical environment prohibiting development in high-risk areas/flood prone areas and applying development controls in moderate and lower risk areas.”*

*- Md. Moynul Ahsan, Bangladesh  
Government Official*

Areas that have incorporated climate considerations into land-use planning include the two Ghanaian districts of Akwidaa and Shama, which have also used a participatory process similar to that of the Latin American case studies. Cape Town, South Africa, has used a Spatial Development Framework to integrate climate change considerations into planning activities. Ho Chi Minh City, Vietnam, has also included climate issues in its land-use plan, however there is no enforcement in respect of such measures. Land-use planning actions that are underway in Kampala, Uganda, include establishing greater space for housing, transport and green spaces as direct responses to increased flooding and rising temperatures. The city of La Paz, Bolivia, has a plan that defines construction limits, and is updated on an annual basis taking climate considerations into account.

Many other cities were mentioned that have implemented land-use plans that consider climate change related factors, but not in an explicit manner. For example, Accra in Ghana has earmarked ‘green’ areas that may not be developed; Chennai’s (India) 2009 development plan includes some recommendations that account for climate change; Delhi and Ahmedabad, also in India, both have plans to improve transportation and reduce emissions.

It was interesting to note that many participants agreed about the barriers to integrating climate change into urban land-use planning and the major downfalls of existing land-use planning tools. Participants noted that other development priorities override climate resilience actions at the city level, that there is a lack of political support for such initiatives, as well as lack of local policy to enforce related regulations.



*"Climate change issues have been discussed over the years and yet a critical look at how development is taking place in my city (Accra) shows that either plans do not exist or there is no political will to achieve them - perhaps key government officials may be victimized should drastic actions be taken. "*

*- Chibeze Sunday Ezekiel, Ghana  
Civil Society*

Many participants mentioned that there is weak capacity at the local level for land-use planning, and a lack of understanding of long-term climate challenges. In addition, participants highlighted poor coordination between government departments and institutions. Some participants noted that land-use planning activities are frequently outsourced to consultants who do not possess a firm understanding of the local reality, and do not effectively communicate decisions back to affected urban dwellers.

*"Rather than do-it-ourselves locally, a consultancy firm was hired from Israel to come and develop the new, expanded land-use plan, partly due to technical capacity issues... Sections of the City Authority (including the Environment and Natural Resources section in which I work) were selectively consulted during the process but at advanced stages when only little could be changed (little input could be made). The public was largely left out of process with the new plan was only unveiled to them through a newspaper article after the plan had been developed. The effects have been many people not understanding what is going on; people worrying about the plan to expand the planning region of the city as being a ploy to grab their land; and neighbouring local governments (districts) raising concerns of some areas under their jurisdiction being included in the Metropolitan Planning Area before they fully understood the process and the proposed plan.*

*- Godfrey Oluca, Uganda  
Government Official*

One of the most significant concerns in terms of urban land-use in the light of climate change is increasing disaster risk. Informal settlements are often developed in high-risk areas such as riverbanks and unstable slopes. In many cities of Africa, Asia and Latin America, regulation to prevent settlement in such areas does exist, but is very limited in its success. Participants identified two significant barriers to enforcing regulations that limit urban expansion in high-risk areas: 1) unawareness amongst the public regarding the regulations and 2) unawareness amongst urban inhabitants of the risks or the reasoning behind land-use policies. It was argued that this situation could be vastly improved by including community members in the development of land-use plans, as was done in Montevideo and Cartagena as well as some other areas described by participants.

Many participants commented on the need to raise awareness of territorial risks among urban dwellers. According to the Latin American experts interviewed for this discussion, the success of land-use plans in Montevideo and Cartagena was largely due to multi-stakeholder involvement. Participants generally agreed that an integrated interdisciplinary approach to land-use planning has many advantages and, if effectively implemented, could improve climate resiliency in their cities. The most significant benefit of this approach was



felt by participants to be that it would enable community members to understand why it is necessary for changes in land-use patterns, and thus help galvanise action at the local level.

*"Climate change is a complex issue which affects and involves all sectors and a system approach is needed. Therefore an integrated interdisciplinary approach to land-use planning as outlined in the interviews would be very helpful in facilitating the cooperation between related departments (for example the Department of Planning and Architecture, Dep. of Transportation, DPI... and DONRE). Also it would enable local participation, local and expert knowledge combination, and assisting well-informed and high consensus decision-making."*

*- Thuy Duong Pham, Viet Nam  
Donor Organisation*

In terms of other cities using participatory methods to integrate climate change into land-use planning, Linda Dsane from Ghana shared examples from the towns of Akwidaa and Shama where a participatory community approach resulted in community members being receptive to their need to relocate in light of them inhabiting areas of high risk. Land-use maps were also used to prevent further development in flood plain areas of the towns.

*"...we used a community participatory approach including the district planners in addressing flood related issues. One thing we noticed was that, the community had been asked to relocate a long time ago using a top-down approach. But with the community participatory mapping approach we used, the community understood the process and they were now willing/agree to relocate to a different site. We also used an area photos maps of the community so they were able to map out the current land use, floodplains/impact areas, where resources are located and future visioning of the community in terms of land use. The District Assembly members were amazed by the process/outcome from community members especially now that they are willing to relocate their settlements."*

*- Linda Dsane, Ghana  
Civil Society*

A further example from Ghana was provided by Edwards Kwaku Duah, who explained an interesting approach to involving institutions and community members right from the initial design phase to the local acceptance stage of planning, however the specific city was not identified. Sanap Aksha from Nepal highlighted another inclusive, bottom-up approach called 'Local Adaptation Plans', more information on which can be found in the supplementary reading section below. Elangovan Balakrishnan from Chennai, India, also shared information regarding participatory processes that were used to develop the city's 2009 development plan (more information on this approach can also be found in the supplementary reading section below).





## Key Lessons

- Across a range of African, Asian and Latin American cities it was found that full integration of climate change considerations into land-use planning is rare. While some cities have developed land-use plans that seek to address climate change to varying extents, these are not strictly enforced. Other cities have implemented land-use plans that consider climate change related factors, but not in an explicit manner. Finally, many cities lack land-use plans all together, meaning they are highly vulnerable to the impacts of climate change.
- Where land-use planning in general, and the incorporation of climate aspects in such planning in particular, are lacking, this is mainly due to local governments prioritising other development needs and a resulting lack of political drive to address climate challenges at the city level.
- Given the nature and objectives of land-use planning participants felt that local inhabitants and experts ought to be involved in these processes. However, in cities in developing countries technical capacity for land planning is generally weak and outsourcing the process often means that local specificities are overlooked.
- When looking specifically at urban settlements in high-risk areas, participants felt that there is significant resistance from urban dwellers to change due to a lack of information. Urban dwellers are either unaware of government regulation that prohibits settlements in certain areas, or they are unaware of the risks and implications of living in such areas. To overcome this issue, community members need to be involved in the urban planning process.

## Supplementary Materials

Participants were provided with the following resources in preparation for this discussion:

- [Video: Interview with Ignacio Lorenzo Arana on Montevideo's Territorial Approach to Climate Change](#)
- [Montevideo Metropolitan Region's Integrated Territorial Climate Plan](#)
- [Cartagena's Integration of Climate Change Adaptation into Land Use Planning](#)

During the exchange, participants shared additional materials and links to relevant organisations:

- [Local Adaptation Plans in Nepal](#)
- [Linking National and Local Adaptation Plans in Nepal](#)
- [Stakeholder Participation Chennai](#)
- [Improving Urban Governance in Chennai](#)



## THE INTEGRATION OF CLIMATE ADAPTATION CONSIDERATIONS IN LAND USE PLANNING IN THE CITY OF CARTAGENA, COLOMBIA

Interview with

**Paula Cristina Sierra-Correa & Francisco Arias-Isaza**

**Paula Cristina Sierra-Correa** is a Programme Coordinator at the Marine and Coastal Research Institute (INVEMAR) in Colombia

**Francisco Arias-Isaza** is the Director General at the Marine and Coastal Research Institute (INVEMAR) in Colombia

INVEMAR conducts basic and applied research on coastal, marine and oceanic systems of national interest. It supports the Ministry of Environment and Sustainable Development (MADS) by providing the scientific knowledge necessary for policy development and evidence-based decision-making. According to Colombian law (Law 99/1993 and Decree 1276 / 1994), INVEMAR is responsible for providing technical and scientific support by conducting studies regarding global change and national environmental policy development, among others. INVEMAR also works to strengthen public systems, including disaster prevention and response and MADS national network of marine research. INVEMAR was designated a lead role in the integration of climate considerations into the city of Cartagena's urban planning, in accordance with the commitments set out in the Framework of Agreements for the Prosperity of the Presidency of the Republic of Colombia.

### Why is urban/territorial planning so important in cities experiencing increasing climate variability?

Cities lacking adequate urban/territorial planning are likely to promote economic, infrastructural and residential development in areas highly vulnerable to climate change. Therefore, if effective urban and territorial planning is not in place climate change impacts, such as rising sea levels in a coastline city, will likely have grave impacts on industries, infrastructure, as well as settlements located close to coastal eco-systems. Informal settlements occupied by low-income populations are often the most vulnerable to climate variability.

Cities with effective urban and territorial planning often maintain robust information regarding local precipitation, sea and air temperature, CO2 emission levels, geology, topography, as well as information related to local social and economic development and the diverse degrees of vulnerability to climate variability among populations located in specific geographic locations. Cities with such information





can better ensure that settlements, infrastructure, economic development or natural green spaces are developed in areas with low climate vulnerability; helping to enhance the city's social and economic viability.

## How has Cartagena gone about integrating climate change adaptation into their city planning?

In order for climate change adaptation guidelines to be integrated into Cartagena city planning and popularised among economic and social sectors in the city, the following steps were taken:

- 1. Compilation of information** from primary and secondary sources regarding the effects of climate change in Cartagena. Information sources included INVEMAR, National Climate Adaptation Planning, the University of Cartagena, University of San Buenaventura, Javeriana University, AVINA foundation, United Nations Development Programme, the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), Oceanographical and Hydrographical Research Center (CIOH) - Colombian Navy.
- 2. Updating information regarding the effects of climate change in Cartagena**, by conducting a vulnerability mapping exercise using data from primary and secondary resources. Data demonstrated the impacts of sea level rise, coastal erosion and climate variability (including flooding, precipitation, drought and storms) as well as declining fish populations and increases in diseases like dengue and malaria. This process was supported by the Climate and Development Knowledge Network (CDKN) and foreign experts who contributed lessons learned from climate adaptation planning in coastal cities in their own countries. INVEMAR also worked with the "Seven Steps" guidelines from the Intergovernmental Panel on Climate Change (IPCC), which were adapted to include the distinct geo-physical, biological, social-economic, administrative and cultural characteristics of territories throughout Cartagena. INVEMAR also made use of data from the 2004–2008 study on climate vulnerability in the initial phases of the municipality's vulnerability assessments. Attempts were also made to integrate traditional knowledge at the local level through participatory mapping activities involving community members. This information was then integrated into vulnerability maps using Geographical Information System (GIS) tools, providing a panoramic view of climate related risks and vulnerabilities throughout the municipality.
- 3. Definition of climate change adaptation guidelines through participatory processes.** According to its legal status, INVEMAR is officially an independent scientific organisation working in the environmental field. Among its various roles it acts as an official advisor to the National Ministry of Marina and Coastal Areas. In light of INVEMAR's non-partisan stance, as well as its reputation at the national level, the organisation was successful in facilitating, through participatory processes, the definition and design of climate change adaptation guidelines for Cartagena city planning. These guidelines provide overall strategic planning direction and detail actions required to reduce the vulnerability of natural and socio-economic systems to immediate and foreseeable future impacts of



climate change. This participatory process involved stakeholders from the Ministry of Environment, National Park administration, the regional and local environmental agencies (CARDIQUE and EPA Cartagena), the Municipal Urban Planning Office, the local Chamber of Commerce and members of the local research community. Information from these various stakeholders was primarily collected via informal interviews. These interviews helped to determine thematic priorities of stakeholders. Workshops were held with civil and economic sectors vulnerable to climate change in Cartagena, along with local institutional, political and policy-making representatives and relevant international experts. On the basis of the information gathered and organised from the participatory stakeholder process, a basic document with adaptation guidelines was drafted and distributed among local stakeholders. It reflects the aspirations, values and ideas of the distinct social groups within Cartagena and represents an effort to move towards a joint definition of the strategic lines and actions needed to adapt the city for climate change.

4. **Incorporation of guidelines into Cartagena's Municipal Land Use Plan** was carried out in coordination with the Municipal Land Use Planning team. The Land Use Planning team transformed the adaptation guidelines into a technical document to support the amendment of the Cartagena's Municipal Land Use Plan. This amendment request was presented to the District Council of Cartagena for its review and any adjustments necessary for approval.
5. **Climate change related information was disseminated to the public** in order to communicate scientific knowledge about the effects of climate change on vulnerable population groups, ecosystems and economic sectors and enhance local capacity to combat climate change impacts. This was carried out via workshops, the dissemination of knowledge materials and the presentation of climate change issues in media broadcasts.
6. **Institutionalisation of information and visualisation techniques using Geoportal and Geographical Information Systems (GIS)** through the integration of geographic information into a web tool for dynamic referencing. This enables online access to mapping conducted for the purpose of the project and offers Web Map Services (WMS) that apply Open Geospatial Consortium (OGC) international protocols and standards.
7. **Publication of the final document** "Integrating Climate Change Adaptation into Cartagena de India's Land Use Planning"

## What are the strengths of Cartagena's model of integrated land use planning, involving climate change adaptation?

A clear strength of the project is the breadth and diversity of the INVEMAR team, particularly the scientific support it offers. What is more, in the face of political instability, a significant strength of INVEMAR's lead on this project is its maintenance of a non-partisan, non-governmental stance and



long-term established work team. A further strength of Cartagena's model is the extent of cross-cultural local involvement in project efforts, particularly through participatory processes, which has been crucial in helping to manage the expectations of diverse stakeholders and has helped contribute to the rapid identification of major plan related issues. We hope that this will in turn help lay the foundation for a robust assessment process.

The National Climate Adaptation Plan for Colombia, prepared by the Ministry of Environment is also being developed at the same time as Cartagena's climate change adaptation initiatives. Consequently, national officials are closely watching the work in Cartagena and using it both to inform the national climate change protocol, as well as to provide a foundation for climate change adaptation efforts in coastal areas across Colombia. Nevertheless, desired results for this plan have yet to be achieved and much work is needed before Cartagena's incorporation of adaptation into land-use planning provides a national example of climate change and development.

## What have been the primary results of Cartagena's integration of climate adaptation into its land use planning?

A significant result of this project has been the overall consciousness that exists now in the municipal land-use planning office regarding climate change considerations. Moreover, the overall enhanced awareness that now exists among those stakeholders involved in the development of climate change adaptation guidelines for land-use planning, particularly those working at the policy level.

The vulnerability mapping portion of the project has also been a significant contribution to the land-use planning department of Cartagena in terms of providing critical up-to-date information regarding climate related vulnerabilities in the city. The vulnerability mapping exercise has also been a meaningful learning experience for the members of the academic and scientific community involved. A further noteworthy contribution of this project component has been the institutionalisation of climate change related information and visualisation techniques using Geoportal and Geographical Information Systems (GIS) into a web tool for dynamic referencing.

A further output of the project has been the incorporation of the information collected through the vulnerability mapping exercise into an influential national strategy to construct housing for low-income populations. This strategy was developed through close collaboration between different units in the municipal administration. Thus, our project efforts are helping to influence decision making regarding where housing construction should take place, with improved awareness of existing and future risk and vulnerability to climate change.



## INTEGRATING CLIMATE CHANGE CONSIDERATIONS INTO TERRITORIAL PLANNING

Interview with  
**Ignacio Lorenzo Arana** from the City of Montevideo, Uruguay



*Ignacio Lorenzo Arana is currently the Project Coordinator for Institutional Strengthening of the National Climate Change Response System of Uruguay, where he also acts as Executive Secretary. He also advises the Under-Secretary of the Ministry of Housing, Territorial Planning and Environment on issues regarding climate change, environment and sustainable development.*

### Why is a territorial approach and territorial planning so important when dealing with increasing climate variability?

The territorial approach allows us to achieve a better understanding of the impacts of climate change. Every different territory has an array of natural vulnerabilities to climate events, for instance problems arise in floodplains when the use or occupation of that territory differs from the natural conditions. So when people occupy a floodplain and there is a flood in that area, it will have a direct impact on goods, services and the quality of life of that community. A second issue is that climate change is specific to local geographic conditions; "climate" cannot be understood exclusively as a meteorological condition, climate is of a meteorological nature but only in regard to location. That is why climate adaptation is also geographically specific. In the historical process of human (evolution), each city and each geographical space has had a particular way of adapting to climate. This is also relevant in understanding how we can face climate change from a territorial approach. Lastly, territorial planning is a discipline that has a long history within public entities, especially within local governments. Territorial planning has become a recognised and respected instrument for addressing climate change impacts that have become more frequent and intense, and also territorial planning provides us with a new perspective in terms of sustainable development. It also directs the growth of the city in terms of areas that should be occupied and the land use and services that are needed.



## What has Montevideo and its metropolitan region been working on in terms of climate adaptation from a territorial approach?

The territorial approach to the climate change project is part of a global programme led by the UNDP. The global programme launched the first pilot project in the metropolitan region of Montevideo. In this pilot project, there were three departmental governments involved - Montevideo, Canelones and San Jose - which came together to create a common climate change strategy. Together these departments are home to two thirds of the Uruguayan population and generate two thirds of Uruguay's national GDP. Montevideo and its metropolitan region are located along the La Plata River, which is the widest river in the world. This has a very important impact on hydric variability in terms of discharge from the La Plata basin, which extends deep into the continent of South America to Bolivia. The river is also influenced by the 'saline front' of the Atlantic Ocean. This greatly affects conditions of the La Plata river during the year.

The territorial approach implies work on a common climate agenda from a territorial perspective and is carried out between regions that share a similar territorial formation (in this case, urban coastlines). In the case of Montevideo, we worked with 700 technicians from different disciplinary backgrounds, such as engineers, environmental scientists and social scientists. We also benefitted from the participation of technicians from local governments, civil society and the private sector. Those 700 technicians worked together in a series of 30 workshops that were organised around topics related to specific territorial formations within the region. During the workshops, several climate change issues were addressed. Approximately half the workshops focused on adaptation issues such as sea-level rise, storm surge flooding, riverside flooding and urban flooding caused by extreme precipitation and water drainage problems in urban areas. They also covered in issues related to extreme weather events. At the end of the workshops, a roadmap was produced for adaptation. Through the use of the territorial approach, adaptation actions were designed based on adequate occupation and use of territory, for example, trying to free-up densely populated urban areas that may be at risk of flooding (currently or in the future) or developing areas that do not present serious climate risks.

Another very interesting issue was that during this process, a new methodology was designed and implemented. This methodology was named "participatory climate impact mapping" and was used to produce a climate impact map containing all available scientific and technical data. The map was revised during the workshops, with inputs from the experts, technicians and citizens involved. Due to the uncertainties of climate change, (scientific) data alone is not enough to design a robust response to climate change. Furthermore, in developing countries there is a lack of public information (in terms of quality of temporal-spatial coverage). In this sense, participatory climate impact mapping is a useful tool for integrating expertise from different disciplines while focusing contributors on a common object (the map). This way, participants can formulate concrete measures without being limited to their own disciplinary logic that often creates difficulties in drafting a common strategy.



## What are the strengths of Montevideo's integrated territorial approach involving climate adaptation?

It is important to note that the territorial approach facilitates easy and immediate dialogue between different stakeholders from different disciplines, who come together to work together on a common object (the territory). It is also important that they are able to engage in an integrated, common strategy. Secondly, it eases the transition from a diagnostic report to an action-oriented strategy. This last issue is problematic when discussing maps and analyses that are exclusively scientific or academic in nature. The territorial and participatory approach implemented in the metropolitan region facilitated the transition from scientific and technical analysis toward a strategic action plan (which is mainly technical, sociological and political). Thirdly, it was also interesting that the territorial approach shed light on local climate change problems. Sometimes climate change is understood exclusively as a global challenge that is irrelevant for local-level engagement, therefore local governments and communities can lack the tools necessary to identify concrete solutions. In this sense, the territorial approach and especially the work around participatory maps helps to bring the problem to a specific local context, meaning that it is known and accepted by the local offices and local communities. Aside from contributing to global mitigation as a community, we began to address adaptation; local governments were able to develop a robust local strategy, bringing them to the root of local problems regarding climate risks. This was a genuinely community-based approach.

## What challenges has Montevideo encountered throughout the integration process?

The first challenge is perhaps related to the discipline itself, since local governments have carried out territorial planning for many years. However, because climate change is a relatively new issue for many local governments and engineers, it has caused some difficulties for technicians who have a more traditional perspective of territorial planning. This is especially evident when trying to integrate climate change into planning instruments, which need to be reviewed and reworked in order to bring out the linkages between land and climate, as well as between the territory and the climate change challenges it faces. Given the uncertainty surrounding how the climate will behave in the future, redefining and reshaping traditional territorial planning tools has been a complex process.

Similarly, given the challenges that the uncertainties of climate change present, an interdisciplinary and innovative dialogue is required. Territorial planning is an interdisciplinary approach, but territorial planners traditionally focus on a particular issue or sector. This tends to discourage the integration of knowledge and dialogue between different experts. A second challenge was the common perspective that climate change as a distant problem that cities and communities cannot address with concrete solutions. Because of this, we had to rebuild the discourse. We learned that it is important to highlight the issues that the community is able to confront at the local level, as well as local land use and occupation





practices that can intensify the challenges we face. This presents a “window of opportunity” in which adaptation can be achieved, using traditional expertise and tools typically exercised by local governments.

## What have been the main results of Montevideo’s integration of climate adaptation into a territorial approach?

So far, the main result has been the achievement of one single planning instrument called “The Metropolitan Region of Uruguay Climate Plan.” It contains a global vision of the main vulnerabilities and the impacts of climate change in metropolitan areas. It also contains the first local Greenhouse Gas (GHG) emission inventory for Uruguay. It provides a roadmap for more than 100 adaptation and mitigation measures that can be implemented at the local level.

A second longer term result concerns institutional transformation (institution building) which has been driven forwards by a permanent Climate Change Working Group housed in the local government of Montevideo. This Working Group is composed of technicians from different government departments working on climate change issues. In this group, representatives from the Departments for the Environment and for Territorial Planning have played a particularly important role in integrating climate change issues into the daily functions of local government. These daily tasks have been redefined from a climate change perspective, which naturally requires more effective engagement with climate issues. For example, we now have a transportation and mobility plan that incorporates mitigation objectives. We are also developing a land-use plan that addresses present, as well as future climate risks. The real results of these public policy actions will only emerge over the next few years. It is too soon to determine at this present stage whether we have been successful, but of course we know that urban development is a process that takes decades (at least in the present LAC context). Only when issues regarding territorial planning and climate change become daily routine, will we be in a position to make decisions about how and where the city must grow and what infrastructure to invest in. Finally, only in the face of future climate change challenges will we know if Montevideo is in fact resilient.

### CONTACT [SSN](#)

To learn more about the Learning Alliance on Climate Resilient Cities, or any of the specific themes raised in the Learning Alliance Highlights, contact the author and Learning Alliance moderator, Charlotte Olivia Heffer, ELLA Brazil Project Coordinator at the Environmental Laboratory at the Federal University of Rio de Janeiro (UFRJ), at [charlotte@lima.coppe.ufrj.br](mailto:charlotte@lima.coppe.ufrj.br).

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