



Resilient Cities 2014

Congress Report

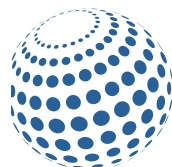
Resilient Cities 2014

The 5th Global Forum on Urban Resilience and Adaptation

29 - 31 May | Bonn, Germany



**NACHHALTIGKEIT.
SUSTAINABILITY.
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World Mayors
Council on
Climate Change

ICLEI
Local
Governments
for Sustainability

Resilient Cities 2014: Congress Report

The publication shall be cited as: "ICLEI, 2014, Resilient Cities 2014: Congress Report"

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Photos: © ICLEI e.V. 2014 (pp. 1, 4, 7, 9, 10, 12, 14, 16, 17, 18), © Shutterstock (p. 5, 13, 17), © Turismo Emilia Romagna (p. 9).

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The Resilient Cities congress series was launched in May 2010 by ICLEI to establish the first global forum on climate adaptation and resilience at the local level. It is co-hosted by ICLEI-Local Governments for Sustainability, the World Mayors Council on Climate Change, and the City of Bonn. The 2014 edition was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada, as well as support from the Foundation for International Dialogue of the Savings Bank in Bonn, and congress sponsors Siemens and Esri.

Based on the 2014 congress proceedings, this publication summarizes key issues affecting cities, local governments and stakeholders around the world. Presentations and session descriptions from the 2014 congress, along with additional publications, multi-media coverage, and updates for 2015 can be found on the Resilient Cities homepage:

<http://resilient-cities.iclei.org>

●●● Introduction

The Resilient Cities 2014 Congress Report summarizes the core discussions and outcomes of the 5th Global Forum on Urban Resilience and Adaptation to climate change. Over the past five years, the issue of urban resilience has gained prominence at local and global levels, resulting in increased activity in and support for this area. This year's congress featured more concrete resilience actions than ever, indicating progress toward implementation while simultaneously underscoring the urgent need for support with local capacity building, financing, monitoring and evaluation (data), and upscaling.

The following pages provide suggestions, lessons learned, and solutions for various aspects of urban resilience and adaptation planning. Numerous case studies from cities around the world highlight innovations and potential pitfalls for different stages of the process. The 2014 report expands upon core themes of the congress series to provide current, actionable advice for local governments to create more resilient cities. The 2012 and 2013 Congress Reports remain relevant and may be read in conjunction for further context.

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●●● Congress at a glance

Congress composition

The congress consisted of 41 sessions over three days:

- 30 thematic sessions and 3 plenary sessions: Opening, Financing the resilient city, Summary and outlook.
- 2 Reality Check Workshops featuring Bologna, Italy and Santiago de Chile.
- 14 Poster presentations in two dedicated sessions.
- 9 Exhibitors present throughout the three days.
- Mayors Adaptation Forum
- 3rd Building and Construction Forum
- Special elements and side events such as an opening reception, strategy and networking meetings, and 2 report launches
- For more information, see the [2014 Program Booklet](#)



Scene setting

Resilient Cities 2014, the 5th Global Forum on Urban Resilience and Adaptation to climate change, gathered more than 400 participants including over 180 speakers in Bonn, Germany. From 29 to 31st May, representatives from local governments, international, and non-governmental organizations (NGO's), academic and research institutes, and the private sector exchanged experiences and solutions on how to make cities more resilient and adaptive to climate change.

"I've learnt a lot from this congress. I'm sure that all these discussions and suggestions and ideas will help and give a great assistance for my town and also for my country (...) I will always encourage other cities to join ICLEI so that together we can fight climate change and reach our goal. All of us should seize this opportunity to provide our assistance."

Mario Désiré Bienvenu, Mayor,
Municipal Council of Curepipe,
Mauritius

Importance for local governments

Resilient Cities provides a global platform where all local governments can learn and be inspired by the broad array of knowledge on offer while contributing their own experiences, whether they are in the first or final stages of resilience planning. The forum connects local leaders and practitioners to a diverse community of experts, hosting multi-disciplinary and multi-stakeholder discussions on the latest research, tools, methodologies, and case studies that encourage innovation and integrated approaches. The congress also facilitates peer learning between cities from around the world – 550 representatives from over 150 subnational governments have attended since 2010. The progress made and partnerships forged at Resilient Cities attest to the success of the series and to ICLEI's continued leadership in local capacity building and international, multi-sectoral exchange.

● ● Congress Rationale

Resilience is key to local development

As centers of global population, economies, and culture, urban areas must be able to withstand stress and shocks to physical, socio-economic, and ecological systems. The capacity to survive, adapt, and bounce back after a crisis or disaster is a city's resilience.

The Intergovernmental Panel on Climate Change (IPCC) reports that global risks from climate change hazards including flooding, sea level rise, extreme weather, and higher temperatures are concentrated in urban areas. These threaten urban infrastructure, flows of goods and services, natural resources, health, and livelihoods, especially in low-income areas. Risk levels will continue to climb unless cities are prepared to manage disaster risks and adapt while reducing emissions (IPCC, 2014).

This points to an integrated approach that captures synergies between sustainable development, adaptation, and disaster risk reduction, mainstreaming resilience thinking into urban planning and policy. Firm, collaborative action is needed to equip cities with the resources, capacity, and funding they need to adopt this approach and move quickly toward the implementation phase. The need for cities to proceed in this manner with the support of local, national, and international partners is the underlying theme of the congress series.

Natural disasters and losses in 2013

2013 was characterized by water-related disasters, with extensive flooding and severe impacts on nearly all continents. In total, natural catastrophes in 2013 led to US\$131 billion in economic losses and US\$37 billion in insured losses, falling below the ten year average.

Losses in human life were more severe. [Swiss Re's sigma study](#) (2014) identified a total of 150 natural catastrophes which resulted in 26,000 fatalities worldwide, making 2013 the 20th most deadly year on sigma records. Typhoon Haiyan in the Philippines - likely the strongest tropical cyclone ever recorded - ranked as the worst humanitarian disaster, with 7,500 deaths, followed by destructive flooding in India which killed 6,000. Heatwaves in the UK (760) and India (531) and an earthquake in Pakistan (399) were among the next most deadly events. As in 2012 and 2011, Asia suffered the most loss of human life. The floods in Central and Eastern Europe were the most costly single event, causing approximately US\$4 billion in insured losses and US\$16 billion in economic losses. Hailstorms in Germany which generated US\$3.8 billion in claims ranked second.

While natural catastrophes cannot always be prevented, the degree of destruction and costs of disaster recovery can be mitigated. According to Swiss Re (2014) "up to 68% of loss from climate change can be prevented using cost-effective adaptation measures". Upfront investments in resilience will save human lives and financial resources in the long run, as rebuilding in the wake of a disaster will always cost more than building the infrastructure necessary to withstand the shock.

●●● Developments from 2013 to 2014

Publications:

[Resilient Cities 2013 Congress Report](#)

"The Data Challenge" in [Crisis Response](#) (Vol 9, 3)

"Looking ahead to the Post 2015 Framework for Disaster Risk Reduction - Outcomes of the Resilient Cities 2014 Congress" in [Planet@Risk](#) (Vol. 2, 5).

"5th Global Forum on Urban Resilience and Adaptation: Resilient Cities 2014 Congress" in [International Innovation](#) (Issue 151).

Progress 2013-2014

As the congress series has evolved over the past five years, so too have local and global discussions of resilience. Resilience is now more widely recognized as an intrinsic part of sustainable urban development and clear progress has been made toward integrated approaches. However, there is a continued need for improved cooperation across departments and sectors. With more cities reaching the implementation phase, additional support is needed for funding, monitoring, and upscaling. Fortunately, this coincides with increased international attention for urban resilience bolstered by new research, including the IPCC Fifth Assessment Report, new capacity building programs, like Rockefeller Foundation's 100 Resilient Cities, and growing interest in financing.

Partnerships

The 2014 congress was supported by a broad community of expert partners. The International Development Research Centre (IDRC) exemplified the theme of researcher-practitioner collaboration, contributing their global expertise in several sessions. Connections to the private sector were deepened with representatives from Esri and Siemens. The involvement of these and 37 endorsing partners ensured a diverse and innovative congress program. In addition, four strong media partnerships expanded the impact of the event.

Research

The report "[Progress and Challenges in the Urban Governance of Climate Change](#)", by Alexander Aylett, Banting Postdoctoral Fellow in Urban Climate Change Governance at Massachusetts Institute of Technology, was released at Resilient Cities 2014. The report explores the state of climate change planning and implementation in cities and is based on a survey of 350 ICLEI members.

Governance

Work to drive forward implementation of the Durban Adaptation Charter has continued led by The City of Durban and ICLEI. The Bonn Center for Local Climate Action and Reporting (carbonn) Climate Registry (cCR) was named the reporting platform for charter signatories. The City of Durban continued exchange visits within the USAID-funded ICMA CityLinks Program to share adaptation knowledge. The charter was presented at several events, gaining 120 signatories at the 2nd Local Climate Solutions for Africa congress and its first US signatories at the 5th Annual Southeast Florida Regional Climate Leadership Summit.

Resilient Cities 2014 Co-Patrons



Christiana Figueres
Executive Secretary,
United Nations Framework
Convention on Climate
Change (UNFCCC)



James Nxumalo
Mayor eThekweni
Municipality/Durban



Helen Clark
Administrator, United Nations
Development Programme
(UNDP)

●●● Mayors Adaptation Forum

The Mayors Adaptation Forum at Resilient Cities 2014 convened 26 Mayors, Vice Mayors and leading city representatives from 18 countries. The forum consisted of four sessions and a Mayors Roundtable focused on three core areas:

Synergies between urban adaptation and biodiversity

There is a need to more effectively educate policy makers, practitioners and the public about the multiple benefits of local biodiversity and eco-system services. Experiences on how to speak to these different stakeholder groups were shared from Copenhagen, Denmark; Philadelphia, USA; Durban, South Africa; and Bogota, Colombia (see page 11).

Climate governance

Resilience is a product of good governance and there is currently a high level of motivation and interest in this topic among city leaders, especially in Africa. The forum discussed synergies between the Durban Adaptation Charter and UNISDR's Making Cities Resilient Campaign. The former welcomed 149 new signatories and realized the establishment of a Secretariat and Regional Hubs for Implementation since Resilient Cities 2013. The latter recently celebrated 2,000 member cities and remains the only globally available tool to help local governments assess their DRR plans and activities.

Position of subnational governments in the post-2015 development agenda

International organizations have been slow to recognize the importance of local governments in climate change negotiations. However, their role is now increasing with subnational input to the post-2015 framework on disaster risk reduction (HFA2), the Sustainable Development Goals, where advocacy has focused on resilience within an Urban SDG, a new climate regime at the COP21 Paris Conference, and Habitat III.

Additional highlights

The forum advanced local climate action with five new cities signing onto the Durban Adaptation Charter and an intervention by Mayors from Shimla, Linköping and Dar Es Salaam at the historical UN ECOSOC Integrated Segment on Sustainable Urbanization in New York via a live video connection. It also facilitated new exchanges on local and global climate policies. Key findings of the IPCC AR5 relevant for cities, summarized in the "Climate Change: Implications for Cities," were discussed with contributing IPCC authors. Finally, the secretariats of the three Rio Conventions were together for the first time in a special joint session.



Five cities signed the Durban Adaptation Charter at a special ceremony with Mayor Nxumalo: Bogotá, Colombia; Moulvibazar, Bangladesh; Santiago, Chile; Singra, Bangladesh; Surrey, Canada

"In my opinion, we can be optimistic entering these processes. Because we have something very important: the triple A, I shall say: Ambition, Action, Alliances. The ambition to cope with climate change and its impacts! Action in mitigation and adaptation! Alliances with our peers, our communities, with stakeholders and other levels of governance!"

Jürgen Nimptsch, Mayor, City of Bonn, Germany; Vice Chair, World Mayors Council on Climate Change

●●● Congress outcomes by theme

This section summarizes the outcomes of the congress parallel sessions, plenaries, and Reality Check Workshops divided by subtheme. Key messages, tips, and examples are provided and cross-referenced to additional information and online resources.

Integrated and collaborative planning

Researcher-practitioner collaboration for evidence-based planning

Collaboration between scientists, practitioners, and policy makers is crucial for developing evidence-based adaptation plans and responses. Sufficient time and a common language are key for cultivating fruitful collaborations and building trust and capacity. An early and ongoing involvement of scientists and researchers in the planning process guarantees a continuous exchange of the latest information, expertise, and results, increasing the quality and credibility of adaptation strategies. It also encourages scientists to showcase their data and results in a way that is easily digestible by “non-scientists” while practitioners and policymakers as the end-users of scientific work can ensure the necessary information is delivered in a timely manner (e.g. [Kosice](#), Slovak Republic).

“We are currently facing the challenge of bridging the gap between researchers and policy makers. We need to make efforts to transform scientific data into information cities can use.”

Nuno Lopes, Head of Environmental Studies and Management Division, City Council of Almada, Portugal

Integrated and cross-departmental planning

Climate change adaptation and urban resilience are cross-cutting themes that require policy coordination and cooperation across sectors, jurisdictions, and scales. Although some cities already take an integrated planning approach, dis-integrated “silo” planning in which resources are managed in isolation by their sectoral departments (e.g. transport, health, water) is still prevailing.

Considering the numerous interdependencies that exist between sectors and the limited financial resources of most local governments, fragmented governance and management practices are no longer acceptable or affordable. Instead, cities should optimize their organizational structures and use of resources by looking beyond sectoral and jurisdictional boundaries, and implement integrated actions. GIZ and ICLEI (2014, forthcoming) have developed an adaptable evidence-based framework for city officials to implement such integrated “[Urban NEXUS](#)” solutions and support them in increasing their institutional performance and resource productivity.

Coordinated action for reduced heat-related health risks

In order to reduce the vulnerability of local communities to heat-related health risks, and guarantee effective heat-disaster response planning, a new scale of coordinated, interagency action is indispensable. The [City of Ahmedabad](#), India, for instance, partnered with a range of academic, environmental, and health groups, and engaged with multiple levels of government to craft an interagency heat action plan and related strategies. The Ahmedabad Municipal Corporation (AMC) appointed its Health Department as the lead agency with the responsibility to coordinate all municipal activities and public health efforts. Having a municipal agency with a cross-departmental coordination role enabled leveraging existing infrastructure and communication channels, and allowed adopting the Heat Action plan in time. Building strong relationships between the city and partners and taking a collaborative approach from early on helped expanding support for action, and increasing the project’s outreach capacity (Shah et al. 2014).

Reality Check: Bologna, Italy

Bologna is home to about 380,000 inhabitants and a flourishing industrial sector. Located on the edge of the Po Valley at the foot of the Apennine Mountains, the Municipality has geographical importance due to its crucial role in the national road and rail network.

Climate change projections indicate that Bologna will face increased temperatures and extreme rainfall events. As such, heat waves and urban heat island, water scarcity, droughts, flooding and landslides are expected to become major challenges in near future for which suitable adaption measures are needed.



Lorenzo Bono, *Climate Change and Urban Sustainability Consultant, Ambiente Italia, Milan, Italy*

Climate adaptation planning in Bologna

Inspired by other European climate adaptation initiatives, the Municipality of Bologna began developing its Climate Change Adaptation Plan within the LIFE+ co-funded [BLUE AP](#) project (Bologna Local Urban Environment Adaptation Plan for a Resilient City) in 2012.

First, a comprehensive information system ([Local Climate Profile](#)) was developed by ARPA, the Emilia Romagna environmental agency, to observe climate variability in the city, assess climate risks and vulnerabilities, and investigate existing resilience capacities by integrating environmental and social data. The Profile helps to identify effective strategies and inform the participatory decision-making process which was established to involve relevant stakeholders in the selection and implementation process of adaptation measures. In addition, the Municipality in partnership with the Kyoto Club developed a smartphone app called Blue AP(P) to inform citizens and stakeholders about adaptation and resilience, and to actively involve them in data collection and communication. The approval of the Local Adaptation Strategy in autumn 2014 will be an important intermediate step in the planning process, defining the core strategies which will then be

translated into concrete actions in the Adaptation Plan. In the meantime, several pilot projects are being implemented, including monitoring the drainage system, examining measures for water use and saving, and promoting urban greening and agriculture activities.

Gaps and challenges ahead

In lieu of an immediate and acute climate change impact, it is difficult to mobilize communities and decision-makers to invest in and mainstream climate adaptation planning. To overcome this and change attitudes in the long run, cities need to raise awareness about climate resilience and adaptation, framing the issue in a way that is appealing and accessible to a broader audience and particularly to public officials and the private sector.

Solutions and tips from Bologna and peer-cities

- Popularize precautionary adaptation planning with awareness raising,
- Provide transparent, accessible information to identify policies that satisfy various stakeholders at the lowest costs,
- Strengthen and facilitate local initiatives by providing the civil society with tools to become more resilient (e.g. smartphone app),
- Implement integrated solutions with multiple and cross-sectoral benefits, such as vegetable gardens, which contribute to food security, climate change mitigation and flood control,
- The [CLIMACT Prio](#) decision support tool helps policy makers and planners to prioritize climate adaptation and mitigation actions, and design the optimum infrastructure for a given urban context.



Emilia-Romagna Region, Italy



Tejas Shah, Health Officer, Ahmedabad Municipal Corporation, India

Creating synergies between adaptation and mitigation planning

Fragmentation across sectors and disciplines can also be observed in the context of climate change adaptation and mitigation planning. These action areas continue to be considered separately by many researchers and policy makers, leading them to compete for funding and attention. Although adaptation and mitigation interests do not always align (e.g. divergent benefits and disadvantages regarding density of built up area, type and material of buildings), there are many ways to overcome tensions and create synergies in practice. For instance, measures for simultaneously reducing GHG emissions and vulnerability to climate change impacts include: green spaces, mixed zoning, smart densification, as well as energy harvesting design and infrastructure. Numerous innovative solutions have already been implemented in cities such as [Freiburg](#), Germany, and [Almada](#), Portugal ranging from flood management systems enhanced with micro hydropower generation to integrated, ecosystem-based approaches (see page 11).

“Long-term success of adaptation depends on the scope and success of mitigation efforts – adaptation should not replace mitigation but should recognize mitigation as a fundamental form of long-term adaptation and aim to integrate the approaches and objectives.”

Astrid Westerlind Wigström, Urban Resilience Consultant, ICLEI European Secretariat / World Bank Group

Case Study: Barriers and solutions for adaptation planning in North-Rhine Westphalia, Germany

Climate adaptation is easily neglected by German municipalities due to budgetary restrictions including competition with high-profile mitigation initiatives. This has led some cities to implement adaptation measures “under cover” with a focus on co-benefits, such as quality of life or infrastructure, for fear of having to justify spending on two separate climate initiatives.

German cities from the state of North-Rhine Westphalia explored solutions during a special workshop at Resilient Cities. Integrating both adaptation and mitigation into city development plans was identified as the best approach to minimize silo thinking and competition for funding. The potential of roadmapping was also highlighted. This process uses backcasting, forecasts, workshops and focus groups to create a roadmap for general and climate development that joins numerous administrative streams, goals, and stakeholders. Burbach municipality and the City of Rheinberg cautioned that both solutions require effective administrative channels to coordinate multi-stakeholder engagement and inter-departmental collaboration.

This workshop was organized in cooperation with the North-Rhine Westphalian Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection.

Ecosystem-based adaptation

Ecosystem-based adaptation (EBA) combines human ingenuity with natural ecosystem services to create living systems that reduce the impact of climate change while providing a range of co-benefits. Incorporating measures such as blue and green infrastructure (GI) into urban environments is a no-regrets approach that addresses multiple climate risks while restoring biodiversity and improving quality of life for residents. GI is easily added as an extra feature in new developments, retrofits, and revitalization projects, however, it is time to move past isolated projects and pursue integrated ecosystem-based approaches linked to overarching development goals. For cities like [Copenhagen, Denmark](#), EBA is the future of city planning, a new precondition that implies a deep transformation in urban planning practices and the way we conceptualize urban space. Key considerations for achieving this transformation include:

Re-evaluation of land use practice and policy


Open space for GI is limited and is being lost to urban creep: London loses 2.5 Hyde Parks of green space annually (Maksimovic & Mirosavic, 2014). Solutions include green planning units, designated eco-districts, and GI zoning ordinances. Cities can use the public domain status of open spaces or purchase development rights for private land. In high density areas, GI can be incorporated into the built environment (e.g. green walls, shade trees, permeable pavement). For instance, [Washington D.C., USA](#) has 195,000m² of green roofs following the passage of a Green Building Act in 2006.

Harmonization with political and economic agendas

Adaptation must work with other political agendas and allow for a balanced approach between development and environmental decisions. [Durban, South Africa](#), for example, has coupled ecosystem restoration with job creation, improving over 3,000 hectares while creating nearly 300 jobs (in 2014). Detrimental impacts of EBA, such as a sharp rise in housing prices, should also be avoided.

Quantifying benefits of GI and ecosystem services

This remains a challenge that requires additional research and more sophisticated modelling systems. However, there is growing evidence of the cost-effectiveness of GI from cities like [Philadelphia, USA](#), which projects a 200% return on its Green City Clean Waters program.

Examples of EBA measures and Green and Blue Infrastructure			
Climate Risk	Ecosystem-based solutions	Adaptation services	Co-benefits (cross cutting)
Drought	<ul style="list-style-type: none"> Waste water recycling Rainwater harvesting 	<ul style="list-style-type: none"> Water conservation 	<ul style="list-style-type: none"> Nutrient recycling
Temperature extremes / UHI	<ul style="list-style-type: none"> Wind ventilation, corridors 	<ul style="list-style-type: none"> Cooling 	<ul style="list-style-type: none"> Energy savings Health
	<ul style="list-style-type: none"> Green walls and roofs Green spaces and parks River and wetland restoration Raingarden, bioswale, treepit Balancing pond, water square 	<ul style="list-style-type: none"> Thermal insulation Evapotranspiration Food production Natural filtration Water storage 	<ul style="list-style-type: none"> Sound buffer Carbon capture Recreation Better air quality Property values
Heavy rain and flooding	<ul style="list-style-type: none"> Permeable pavement Downspout disconnection 	<ul style="list-style-type: none"> Restored hydrology Water storage 	<ul style="list-style-type: none"> Better water quality
Sea level rise and tidal surges	<ul style="list-style-type: none"> Living shorelines 	<ul style="list-style-type: none"> Coastal buffer Biodiversity 	<ul style="list-style-type: none"> Habitats Aesthetics
All of the above	<ul style="list-style-type: none"> Reforestation ,revegetation, including mangrove planting 	<ul style="list-style-type: none"> Coastal buffer, water capture, shading, etc. 	<ul style="list-style-type: none"> Invasive species control

Examples and resources:

Tools and cases shared at the congress included:

- The [Blue Green Dream project's](#) tools for quantifying GI impacts
- GI site selection strategies from [Boston, USA](#) and [Bararanquilla, Colombia](#)
- The "[Nature of Mainstreaming](#)" toolkit for biodiversity and ecosystem services planning
- National Wildlife Federation's [Green Works for Climate Resilience](#) - a community guide to nature based climate planning

Reality Check: Santiago, Chile

Santiago, Chile's capital and largest city, has nearly 7 million inhabitants and generates over 40% of the country's GDP. It is located in the upper basin of the Maipo River, which provides water for domestic use and plays a crucial role in Chile's economy.

Pressure on water resources in the basin is rising as Santiago grows in both size and population. Meanwhile, the city has had to cope with four consecutive years of drought and is projected to continue experiencing rising annual average temperatures and reduced precipitation. Santiago has also faced occasional floods from intense rainfall events that cause high turbidity levels and disrupt the water supply. The development of effective climate adaptation measures is crucial for Santiago to sustain water resources and thus economic activities.



Water scarcity in the Maipo River Basin, Santiago Metropolitan Region

Climate change adaptation planning

In the past years, Chile has seen a growing interest in climate change adaptation reflected in both numerous national programs (e.g. National Adaptation Plan) as well as locally-based projects. The [Climate Adaptation Santiago](#) (CAS) project was launched in 2010, to develop adaptation measures for the most vulnerable sectors in the Santiago Metropolitan Region: energy, water, and land use. Core aims are to establish ongoing dialogue between scientists and practitioners and build capacity for involved stakeholders. A participatory process brings together local and regional actors in a number of [round table meetings](#) and a [regional learning network](#). In addition, the IDRC-funded [MAPA](#) (Adaptation Plan for the Maipo Basin) project pinpoints existing vulnerabilities in the catchment area and supports development of a climate change adaptation strategy. This project maps the basin's vulnerabilities, analyzes impacts of climate and land use changes and models various water supply and demand scenarios in cooperation with a diverse range of stakeholders. Furthermore, the project seeks

to provide a multi-stakeholder forum involving a range of water users and water sector actors to raise awareness and build expertise for lasting solutions.

Planned and implemented actions

- Promoting responsible water and energy consumption,
- Efficient agricultural irrigation technologies ,
- Reducing pipe leakage
- Diversifying energy and water supply sources,
- A new water management structure for the Basin,
- Retrofitting canals to reduce stormwater runoff

Gaps identified and challenges ahead

Challenges include a lack of convective storm prediction and turbidity early warning stations, emergency plans based on winter rather than summer events, and the difficulty in identifying crucial clients and effectively communicating problems. Lasting improvements in the water sector require better coordination among suppliers and increased awareness amongst consumers and policy makers of the importance of effective water consumption. With much of the relevant information and scientific data being generated, future priorities lie in developing processes that ensure evidence-based adaptation planning and implementation.

Solutions and tips

- Use of water reservoirs to secure water supply for 32 hours after a turbidity event.
- Develop collaborative processes that ensure science-based policy and practice.
- Encourage self-organized local water management and bottom-up participatory methods.



Sebastián Vicuña, Director, Project MAPA; Executive Director, Centre for Global Change, Universidad Católica de Chile, Santiago, Chile

Increasing local capacity, awareness, and private sector involvement

Advertise the contributions of ecosystems and biodiversity, connecting EBA to local concerns and culture (e.g. traditional [Tuboniwa gardens in Tokyo](#)). Start with low-cost, supplementary, or demonstration projects to build capacity and acceptance. Speak the language of business - by linking to supply and production, services valuation, investment returns etc. - and incentive EBA measures to engage the private sector.

Cross-sectoral and interdepartmental collaboration

Successful EBA implementation requires continuous input from a wide-range of actors including engineers, utility companies, ecologists, and economists. This can be facilitated through multi-stakeholder workshops, as with [Singapore's Ang-Mo Kio Park](#), or a shared goal (and deadline) as with London, UK's Olympic Park.

In Focus: Resilient Urban Food Systems

Local and national policies to safeguard food security and sustainable livelihoods

Building upon the [Resilient Urban Food Systems Forum](#) held at Resilient Cities 2013, this year's congress hosted a discussion on the role of local and national policies to institutionalize and encourage urban and peri-urban agriculture (UPA).

What are the challenges and priority areas of action?

Many cities are promoting UPA for marketing reasons without acting to consolidate and support its further development. Putting UPA on the political agenda can raise awareness of its numerous benefits while enhancing community-based and bottom-up initiatives. Local and national policies, as well as the incorporation of agriculture into land-use planning are crucial steps to reserve and allocate suitable land for agricultural use and ensure its long term-availability, particularly in the context of intense competition for land and speculation.

"Our Council recently confirmed some funding to employ a staff resource to start identify actions we could take to support community efforts to make our local food systems more sustainable and resilient - I can't wait for them to get started!"

Jinty MacTavish, City Councillor, Dunedin City Council, New Zealand

Three case studies

In response to high unemployment and increasing poverty rates, [Rosario, Argentina](#) made urban agriculture a permanent activity in 2002. The municipality has also fully incorporated urban agriculture into its land use planning and urban development strategies. Today, more than 30ha is used to grow food. Political and institutional commitment from the national to the local level and a clear policy of social inclusion helped build this successful program in a short period of time. (FAO 2014)

Following major shocks from global food prices and Hurricane Omar (2008), [Antigua and Barbuda](#) launched the National Backyard Gardening Program as part of its National Food Production Plan to strengthen food security. This was partly done by boosting the overall contribution of traditional home gardens to national food security. The National Backyard Gardening Program is active in all district of the country and already helps to produce 280 tons of vegetables annually. (FAO 2014).

The city of [Ghent, Belgium](#) applied institutional restructuring to scale up urban and peri-urban agriculture. A coordinator was appointed to initiate collaboration between a broad array of private and public actors as part of the 'Gent en garde' initiative to create a more local, sustainable urban food system.

City-to-city cooperation

What is the value of municipal climate partnerships?

Many international declarations by cities on climate change (e.g. [Durban Adaptation Charter](#), Nantes Declaration) regard active partnerships and city-to-city cooperation as a key strategy for strengthening the efforts of cities in the field of adaptation and mitigation. A systematic, long-term, bilateral cooperation ensures mutual learning and helps build local capacity through the exchange of information, know-how, and technology. It also offers the opportunity for regular reflection and action prioritization while aiding in the development of new ideas and methods.



What are the relevant pre-conditions and key aspects to be considered?

Building a successful partnership requires commitment, two-way communication, context-specific understanding, and most importantly, time. There is no universal approach. Instead, the framework conditions of each partnership should be developed according to local structures, challenges, and potentials. As many cities do not have the resources to establish and maintain a partnership on their own, the private sector and other relevant stakeholders should be involved from early on to contribute support and cross-sectoral perspectives.

What steps need to be taken?

1. Establish framework conditions: Identify similarities, differences, and benefits for both cities, create working structures and involve relevant stakeholders, share information and specialized knowledge, and compose a baseline review.
2. Design a workplan: Specify joint objectives and measures, define responsibilities, prioritize fields of action, and secure internal and external funding.
3. Implementation and monitoring: Implement measures, monitor outcomes, and modify actions accordingly.

Cities need to work with each other. For instance, in cities where the challenges are similar but the capacity levels to tackle the challenges vary; we need mechanisms for exchange and support. I firmly believe that the capacity of one city could be used to help many other cities at a city to city level.

Eng Mussa B. Natty, Director, Municipal Corporation, Kinodoni City, Dar es Salaam, Tanzania

Case study: International collaboration in Chinese cities

Chinese cities must plan for an unprecedented scale of urban development while preventing carbon lock-in and reducing pollution. Several national policies support sustainable urbanization including the 12th Five-Year-Plan (2011-2015), the National Urbanisation Plan, and the National Pilot Program for Low Carbon provinces and cities. However, implementation is hindered by a one-size-fits-all approach and a lack of local capacity.

International collaboration offers one solution. City to city partnerships like E3G and Germanwatch's "[Sino-European Partnership on Low Carbon and Sustainable Urban Development](#)" between Bonn-Chengdu and Duisburg-Wuhan facilitate knowledge-sharing, and support the implementation of demonstration projects for low-carbon development. International collaboration initiatives have also come in the form of providing direct services; [GIZ](#) currently has a number of cooperation projects supporting Chinese cities in reaching their Low Carbon Development and Energy Efficiency targets by identifying capacity building needs in Chinese cities and providing the necessary tools and trainings.

Data for resilience

Resilient Cities 2014 emphasized the importance of data and featured a special in-focus session on spatial data for resilience organized in cooperation with Esri.

Despite the growing amount of information on national vulnerability and resilience, data at the local level remain limited and generally inaccessible. This causes particular challenges for the assessment of urban risks and vulnerabilities – a step that requires a solid foundation on data. Different plans to downscale data from the national to the city-level are currently being investigated by the [Notre Dame Global Adaptation Index](#) (ND-GAIN), which ranks 177 countries based on their vulnerability to climate change and their “readiness” to adapt. In addition to downscaling data, it is important to share data among agencies (e.g. private sector, city departments etc.), and make them publicly available (open data) to end wasteful duplication. Interagency collaboration also allows cities to tap into the full potential of tools like Geographic Information Systems (GIS) that integrate and visualize complex risk and resilience information from multiple sources, to support the development of integrated resilience solutions.

[Spatial data infrastructure](#) (SDI) provides a technical and institutional framework for developing and sharing the most important information among all sectors and has been proven to strengthen collaboration and governance (e.g. Colombia SDI, US NSDI, Canada Geospatial DI, INSPIRE). In addition to data sharing, there is a need for standardizing indicators across cities to ensure comparability and support learning and development processes. Initial steps towards standardizing city data on a global level are currently underway. These include the foundation of a [World Council on City Data](#) (WCCD), which will coordinate efforts on city data to ensure a consistent and comprehensive platform for standardized urban performance metrics, and the first ISO International Standard on city indicators ([ISO 37120](#)) developed by [GCIF](#) to provide a set of standardized city performance indicators and a standard approach for measuring each one.

Financing resilience and resilient development

Lack of financial resources remains a major constraint for local governments. Respondents to the Urban Climate Change Governance survey identified this as the primary challenge for climate change planning and implementation (78% of cities), while insufficient staff funding ranked third (67% of cities) (Aylett, 2014).

The second point – a lack of human resources – often prevents cities from accessing and absorbing available funds. Thus, institutional capacity building is needed alongside additional and alternative funding sources, including locally-controlled funds. Capacity gaps commonly exist in the areas of financial data collection and analysis, matching and marketing projects to investors, and financial governance. Good practice solutions include:

- Partner with universities to conduct low-cost feasibility studies (Bogota, Colombia)
- Divide programs into a prioritized menu of discrete projects with investment statements, time schedules, and marketing plans ([Copenhagen, Denmark](#))
- Frame projects according to investors' interests, highlighting co-benefits beyond adaptation (Surrey, Canada)
- Bundle projects within and between cities and regions to access larger funds
- Prioritize needs and investments ([Shimla, India](#))
- Break long term plans into phases assigned to specific departments and guided by regular input from a steering committee, the public, and financial advisors ([Nagoya, Japan](#))

“We do have good data on nations, but not on cities. There is a need for standardization to learn, compare, and develop.”

Nico Tillie, Vice-President World Council on City Data, Toronto, Canada; Researcher / Lecturer, Delft University of Technology; Landscape Architect, City of Rotterdam, the Netherlands

"We should remember that we need to finance not only resilient infrastructure, but also resilient agents and resilient institutions."

David Dodman, Senior Researcher, International Institute for Environment and Development (IIED), London, UK

Cities can also take advantage of new resources created to address these gaps. GIB's [Grading tool for Sustainable Infrastructure](#) helps cities to assess the bankability of innovative infrastructure projects, reducing risks and uncertainty for investors. In Asia, [CDIA](#) and [USAID](#) link cities to potential financiers and ensure projects meet funding requirements. Lastly, organizations like the World Bank and Rockefeller Foundation are working to improve local financial governance and align financial markets with cities' needs.

The increased investment in local institutions is encouraging, as is the increased funding available from regional and global sources for adaptation measures (Adaptation Fund, Green Climate Fund,) resilient infrastructure (World Bank, Asian Development Bank), and ecosystem-based adaptation (Global Environmental Fund).

However, cities should first mobilize domestic funds, existing assets, and local revenue streams (e.g. [inner-city road taxes](#)). Showing that local opportunities have been exhausted may help when applying for international funds. Furthermore, with locally-controlled funds cities are more accountable and responsive to local needs and can work within relevant fiscal frameworks. Examples include [bundled green bonds](#), un-earmarked grants, [community development funds](#), or in-kind contributions from communal action (e.g. tree planting).



Dianne Watts, Mayor of Surrey, Canada; Director; Metro Vancouver Board

Case study: Financing Resilience in Metro Vancouver, Canada

Using development as an asset, Metro Vancouver has implemented a variety of measures to raise local funds for sustainable, resilient development including density bonuses, development cost charges, and a green city fund. The municipal finance authority has also partnered with the national government and private sector (PPP) to fund a waste-to-energy biofuel plant in the City of Surrey.

Rather than waiting for external funding, Surrey's Mayor Dianne Watts recommends that cities leverage existing assets to make projects compelling to investors and pursue integrated approaches when allocating resources.

Resilient Infrastructure

The majority of infrastructure that will be in place by 2050 doesn't exist today. This presents a huge opportunity to invest in more resilient urban infrastructure, a theme that was discussed across several congress sessions.

The first step is identifying potential vulnerabilities, which can lead to better general frameworks for climate change action without large investment. [Santo Domingo, Dominican Republic](#) used this paradigm to adopt a resiliency approach for its sewage treatment plants. The result was improved interdepartmental and interagency cooperation, formalized via a working group which has reoriented these agencies toward resilient infrastructure services. The program also built local capacity for further adaptation action.

Another important consideration, particularly in developing cities, is resilient transport systems. In [Ho Chi Minh City, Vietnam](#), streets are dominated by motorbikes, whose riders are exposed to risks from heavy rainfall and flooding. [Siemens](#) presented an integrated approach which provides flexibility and responsiveness by attracting ridership to public transportation and applying remote traffic signaling to safely direct riders and emergency response vehicles in a disaster.

Building and construction forum

Resilient Cities 2014 hosted the third building and construction forum. The forum focused on linking resilient buildings to resilient infrastructure systems and the potential of green infrastructure (page 11). There are opportunities to adopt more comprehensive building strategies that combine adaptation and mitigation and plan for multi-scalar resilience. This includes linking buildings to networked infrastructure to create cities that are resilient from the ground up. Resilient buildings complement and adapt to their immediate and extended environments.

Looking at the macro level, life cycle analyses can identify ways to lessen the 'resource footprint' of building construction and maintenance. This helps to reduce pressure on urban ecosystems and increase resilience to changes in supply (e.g. lower water tables). Green building practices also provide a range of opportunities to reduce broader environmental impacts while increasing resilience to changing micro-climates. For example, better insulation protects against temperature fluctuations and saves on energy/fuel consumption. However, a large set of green building strategies are based on historical climate assumptions, so new standards are needed. One solution is the [LEED Climate Resilience Screening tool](#). The tool is used to determine which LEED systems and credits improve resilience, informing new policies and building standard.



Susanne Krings, Policy Advisor, German Federal Office of Civil Protection and Disaster Assistance

In addition, green buildings are less susceptible to disruptions due to reduced dependency on centralized energy, water, and waste systems. The [City of Seoul](#), Republic of Korea has adopted a policy of green and energy efficient buildings in order to reduce overall consumption as part of its One Less Nuclear Power Plant initiative. This has been achieved in part by incorporating green infrastructure such as green walls and roofs (see page 11). The goal is to improve the self-sufficiency of individual buildings, thereby reducing the need for and risks from additional nuclear power.

"Just like sustainability, resiliency is a journey not a destination. Together, we have embarked on this important journey to find the answers to these questions, which will pave the road to a more sustainable and more resilient built environment."

Jason Hartke, Vice President, National Policy, U.S. Green Building Council, Washington, DC, USA

●●● Side events and launches

Open European Day: Building on the success from 2013, ICLEI European Secretariat and the European Environment Agency (EEA) organized the second edition of the [Open European Day](#). Through an interactive format, the Open European Day provided hands-on information on advancing climate change adaptation. It also offered a platform for knowledge exchange and open discussions between city leaders, adaptation manager and practitioners, and key urban adaptation stakeholders.

Urban Agriculture Strategy Meeting: ICLEI World Secretariat in partnership with Plantagon International AB and the RUAF Foundation organized the [Urban Agriculture Strategy Meeting](#). The meeting aimed to advance the debate on drivers and enabling framework conditions for sustainable urban food production and to provide input for the Urban Agriculture Summit 2015, which is planned to take place from 20-22 May 2015 in Berlin at Metropolitan Solutions 2015.

Report Launch: The report "[Climate Change: Implications for Cities](#)", jointly published by ICLEI and the University of Cambridge's Institute for Sustainability Leadership and Judge Business School, supported by the European Climate Foundation, was launched at Resilient Cities. The report summarizes the key findings for cities from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5), demonstrating the need for integrated actions at the local level. The report provides a concrete evaluation of adaption, resilience, and mitigation strategies and outlines those that have proven successful.

Cocktail and PechaKucha event: [Bologna Municipality](#) along with partners of the BLUE AP project hosted a cocktail event followed by a PechaKucha-style presentation session with participants invited to present creative and outside the box adaptation planning ideas to a panel of judges. The best idea won a free pass to the final BLUE AP project conference in summer 2015.

Film launch: The film "Knowledge and Adaptation - Climate Change Impacts in Asian Cities and Ways to Adapt" was launched at Resilient Cities 2014. It was produced in the context of ICLEI's [AsianCitiesAdapt](#) project, which brought together scientists and policy makers to support local governments in identifying possible implications of climate change and developing evidence-based adaptation strategies.

Habitat III Think Tank: The Habitat III Think Tank meeting was running parallel to Resilient Cities 2014 and brought together a number of experts to share their insights regarding the current conception of cities, the urban problématique and the related evolution of the urban development agenda since Habitat II.

MIT CoLabWinner presents SMRIS: MIT Climate CoLab 2012/2013 contest winner for Urban Adaptation, Michaël Houle, presented how a [Seasonal Migration Routes Identification System](#) (SMRIS) will help predict the evolution of seasonal migratory routes in function of increasing vulnerability to floods in the Mekong Delta, Vietnam. The SMRIS will provide city governments and urban planners with the necessary information to predict cities' influx or outflow of seasonal migrants in order to be prepared to absorb drastic temporary demographic changes.



Audience voting for the best PechaKucha-style presentation

●●● Outlook for 2015

Resilient Cities 2014 showcased more concrete case studies of ongoing and completed resilience actions than ever before, demonstrating that progress is being made in all aspects and phases of resilience planning. Major achievements range from the first ISO approved International Standard on city indicators to ensure comparability between cities' performance, to the development and implementation of new financing mechanisms and locally-controlled funding models. Yet, the absence of localized data, low engagement with the private sector, limited community awareness of key adaptation issues, and insufficient capacity within local governments to develop and secure funding for integrated projects all remain major obstacles to adaptation planning. It is crucial that cities and other actors including businesses and health agencies cooperate to achieve more robust, coordinated resilience responses. Cities also need to better market and frame resilience concepts to potential investors and community stakeholders. Lastly, support for integrated adaptation and mitigation approaches and the use of ICT's for climate adaptation and disaster response should continue. These themes will be explored further at upcoming Resilient Cities events.

"Now, in the run-up to Lima and Paris, is the time for city leaders to interact effectively with national governments. This is why I'm pleased to see the success of Resilient Cities 2014 paving the way for cities around the world to play a key role in the upcoming international climate negotiations."

Christiana Figueres, Executive Secretary, UNFCCC

At the global level, 2015 will be a turning point for local governments, determining both cities' role and visibility in international negotiations and their daily work on the ground. In order to ensure that local governments are appropriately engaged, empowered and recognized as governmental stakeholders in the long run, we have to strengthen their position at the key milestone events of the post-2015 development agenda related to cities and resilience (e.g. 3rd World Conference on DRR, UNFCCC COP21, UN Summit).

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Save the dates!

Resilient Cities

Asia Pacific 2015

1st Asia Level Forum on Urban Resilience and Adaptation

11 - 13 February 2015 | Bangkok, Thailand

Building on the success of the global congress series, Resilient Cities Asia Pacific now brings the event and the focus to Asia Pacific. The congress will cater to the priority themes, challenges, and opportunities of local governments specifically in this region.

Contact iclei-southasia@iclei.org for more information.

Resilient Cities 2015

6th Global Forum on Urban Resilience and Adaptation

8 - 10 June 2015 | Bonn, Germany

The congress will focus on driving forward implementation and financing of integrated adaptation solutions. See the congress website at <http://resilientcities2015.iclei.org/> for the latest updates. The call for contributions opens 1 October 2014!

Contact resilient.cities@iclei.org to discuss partnership opportunities for sessions, forums, co-events, and exhibiting.

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