



Resilient Cities Report 2016

Global developments in urban adaptation and resilience

*BASED ON THE PROCEEDINGS OF THE 7TH GLOBAL FORUM ON URBAN RESILIENCE AND ADAPTATION
6 - 8 JULY 2016 | BONN, GERMANY*



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Resilient Cities Report 2016: Global developments in urban adaptation and resilience

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The Resilient Cities congress series was launched in May 2010 by ICLEI to establish the first global forum on local level climate adaptation and resilience. It is co-hosted by ICLEI - Local Governments for Sustainability and the City of Bonn. The 2016 edition was carried out with the support of the International Development Research Centre (IDRC), the Global Infrastructure Basel Foundation (GIB), Cities Alliance, and the Foundation for International Dialogue of the Savings Bank in Bonn.

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Based on the congress discussions, this publication summarizes key issues affecting cities, local governments and stakeholders around the world. Presentations and session descriptions from the 2016 congress, along with congress proceedings, additional publications, multi-media coverage, and updates for 2017 can be found on the Resilient Cities website: <http://resilient-cities.iclei.org>

Introduction

Resilient Cities is the global forum on urban resilience and adaptation convened in Bonn, Germany. The congress series provides an international platform to share the latest information, good practices, challenges, and innovations for creating more resilient cities. From 2016, the congress also provides an opportunity to track local progress on the resilience targets of the Sustainable Development Goals. The congress outcomes present an annual snapshot of the state of urban resilience, building on discussions and developments from previous years.

The 7th edition of Resilient Cities focused on driving forward implementation and financing of urban resilience toward the goal of a more sustainable, inclusive and resilient urban development. The program featured for the first time a forum on inclusive resilience with speakers from informal settlements and the informal sector. A forum on Financing Resilience was held for the second year with investors, donors, and insurance industry representatives. Further topics included disaster risk reduction; researcher-practitioner collaboration; resilient food, energy, and water management systems; and urban refugees, which was the subject of a special plenary.

This report reflects the outcomes of Resilient Cities 2016 and broader developments in the field of urban resilience and climate change adaptation. Based on the experiences of local governments and international experts, the following pages present case studies and lessons learned from around the world. The findings build on the previous Resilient Cities Reports from [2013](#), [2014](#), and [2015](#).

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●●● Resilient Cities rationale

Why Resilient cities?

The majority of the world's population, over 3.96 billion people, live in cities (UNDESA, 2015). As centers of population and economic activity, cities concentrate risks while also amplifying hazards. This is especially true in relation to climate change and natural disasters. The latest scientific findings, as synthesized in the

A 'Resilient City' is prepared to absorb and recover from any shock or stress while maintaining its essential functions, structures, and identity, as well as adapting and thriving in the face of continual change (ICLEI, 2015).

IPCC Fifth Assessment Report (IPCC, 2014), forecast more frequent and intense heat waves, storms, and an accelerated rate of sea level rise, with disproportionately high impacts on urban areas. These trends are reflected in the loss and damage figures for disasters and extreme weather events.

In 2015, nations recognized the urgent need for resilience-building at all levels within the principles and targets of three global frameworks: the Sendai Framework for Disaster Reduction, the Sustainable Development Goals, and the Paris Agreement. For the first time, governments have a scientific as well as a political mandate, at the highest levels, to take swift and bold action to create more resilient cities in cooperation with all stakeholders.

Natural disasters and losses in 2015 and early 2016

2015 witnessed 198 natural catastrophes, the highest ever recorded in one year, according to Swiss RE's sigma study (2016a). As in the previous four years, Asia was hit the hardest. The 7.8 magnitude earthquake in Nepal in April 2015 was the deadliest and costliest disaster of the year, with close to 9,000 victims and USD 6 billion in estimated losses including damages reported in India, China and Bangladesh.

2015 was also the warmest year on record since 1880 owing largely to an abnormally strong El Niño (NOAA, 2016). Heat waves in India and Pakistan claimed over 3,500 lives. Although extreme heat is common in the pre-monsoon season on the Indian subcontinent, in 2015 (May – June) the heat (47°C in some locations), spread far beyond areas usually affected (WMO, 2016). In Europe, casualties reached 1,200 (July) while summer temperatures remained above 30°C for long periods and drought conditions persisted in the Eastern region, particularly Romania, until the end of the year (Swiss RE, 2016a).

Other events caused considerable human and financial losses during 2015, such as the heavy seasonal rainfalls which claimed over 450 lives and left 250,000 people homeless in Malawi, Mozambique, and Zimbabwe (January); the floods in northern Chile, one of the driest places on earth, which amounted to USD1.5 billion in losses (March); and the deadly landslides in Guatemala (October), which left behind 350 victims and over 400 homeless (Swiss RE, 2016a).

Overall, more than 26,000 people lost their lives or went missing due to natural disasters in 2015, double the number of deaths compared to 2014. Total economic losses however, were down from 2014, amounting to USD 92 billion, of which USD 37 billion were insured (Swiss RE, 2016a).

In the first half of 2016, natural disasters have already cost an estimated 6,000 lives and losses of USD 68 billion. On 16 April 2016, a series of earthquakes hit Kumamoto, Japan, leading to 64 deaths and infrastructure damages of approximately USD 5.6 billion. On the same day, a 7.3 earthquake struck Ecuador claiming the lives of 668 people (Swiss RE, 2016b). Due to the low insurance penetration in the region, insured losses amounted to just USD 400 million. In August, Italy's Umbria region suffered a 6.2 earthquake that caused 293 deaths and rendered 4,000 homeless. The damage is estimated at USD 3.96 billion (Swiss RE, 2016c).

These figures demonstrate the severe and growing threat of natural disasters and climate change, especially in less developed economies. Local governments and partners from the private sector and insurance industry have a great responsibility to invest in more resilient infrastructure, services, and risk reduction strategies that protect the lives and livelihoods of all urban residents. The data also serve as a reminder that disasters do not respect administrative borders. Multi-level cooperation is essential to achieve the system changes necessary for sustainable and resilient urban development.

2015 Global Frameworks: United for sustainable, resilient development

The global frameworks adopted in 2015 represent a watershed for multi-level, multi-stakeholder cooperation. After decades of ambitious action, local governments have been recognized as key stakeholders and contributors in all three frameworks. All levels of government are now united to decrease disaster risk and losses, to reduce the impacts of climate change, and to pursue inclusive, sustainable and resilient development.

The [Sendai Framework for Disaster Risk Reduction 2015-2030](#) (SFDRR), adopted in March 2015, changes how disaster response is conceptualized by shifting the focus from managing loss toward reducing risks. Its seven targets aim to reduce the number of people killed or affected by disasters and the amount of direct economic losses. These were incorporated into the resilience targets of the [Sustainable Development Goals 2015-2030](#) (SDGs), adopted in September 2015, including in [Goal 11](#) to make cities “inclusive, safe, resilient, and sustainable.”

The targets are due in 2030 except one: by 2020, cities must have updated disaster risk strategies that account for the new norm of risks and impacts (see page 4). Some cities like Bangkok, a participant of the [UNISDR Making Cities Resilient Campaign](#), have already begun aligning local plans with these targets. For the rest, a rapid deployment of resources will be needed over the next five years.

Adaptation and risk reduction also feature strongly in the landmark [UNFCCC Paris Agreement](#) adopted in December 2015. The agreement sets a clear goal to limit the global temperature increase to 1.5 degrees Celsius above pre-industrial levels. It incorporates the principles of the SFDRR and SDGs and provides for unavoidable losses by continuing the [Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts](#). Implementation will be supported by a Paris Committee on Capacity Building and a new technical examination process on adaptation intended to build on existing capacities.

The [outcomes of Paris](#) exceeded expectations. Borrowing a phrase from Christiana Figueres, Mayor Sridharan of Bonn noted how “transformative optimism” fueled a massive mobilization ahead of the meeting. Cities and non-party actors submitted over 11,000 climate actions to the [NAZCA portal](#). In Paris, over 600 local leaders gathered at the [Cities and Regions Pavilion](#) and the [Climate Summit for Local Leaders](#) to reaffirm their commitment and showcase local climate actions. Further initiatives were announced during the [Lima-Paris Action Agenda](#) thematic sessions and at events throughout the conference.

The limiting factor now, as UNFCCC spokesman Nick Nuttall notes, is not ambition but time and money. With approximately five years to peak and reverse emissions, all actors must be held accountable to their pledges and work together to mobilize private capital and reform financial systems. The same applies for the SDGs and Sendai Framework. A concentrated and coordinated global effort is needed, different from what has been done before, to achieve the post-2015 targets.

For local governments this should include support for measuring progress using the right data, indicators, and monitoring mechanisms. In parallel, support is needed for knowledge creation and sharing to promote good practice. A selection of relevant available resources is provided below.

- [Global Covenant of Mayors for Climate and Energy](#) – merger of the EU Covenant of Mayors (including MayorsAdapt) and the Compact of Mayors, the largest coalition of mayors promoting and supporting voluntary action for climate adaptation and mitigation.



Laurence Tubiana, COP 21/CMP 11 Presidency; Former UNFCCC Executive Secretary Christiana Figueres; & COP 21/CMP 11 President Laurent Fabius, Foreign Minister, France Photo credit: IISD/ENB

- [Climate Risk and Adaptation Framework and Taxonomy](#) (CRAFT) – standardized reporting questionnaire to track progress on local adaptation efforts. A support tool for the Global Covenant above incorporated into the [carbonn Climate Registry](#) and [CDP](#).
- [Resilient Cities Connect](#) (beta) – platform for cities, development partners and businesses to exchange knowledge, services and capacities to increase local resilience.
- [Resiliencetools.org](#) – collection of global tools and resources to help local governments improve city-level resilience. First joint output of the Medellin Collaboration on Urban Resilience and the Cities Alliance Joint Work Program on Resilient Cities, with an accompanying [Local Governments Pocket Guide to Resilience](#).

Resilient Cities 2016 Co-Patrons



United Nations
Framework Convention on
Climate Change



Robert Glasser

Special Representative of
the Secretary-General for
Disaster Risk Reduction, United
Nations Office for Disaster Risk
Reduction (UNISDR)

Updates on the Resilient Cities congress series

Resilient Cities Asia-Pacific 2016

The second Asia-Pacific Forum on Urban Resilience and Adaptation, [Resilient Cities Asia-Pacific 2016](#), was held in Melaka, Malaysia 2-4 March, 2016 in conjunction with the 16th International Convention on Melaka Twin Cities. The forum was attended by over 500 participants from 98 cities in 31 countries. The program included segments on finance, informal settlements, green and resilient growth, youth, technology, and global frameworks ([congress summary](#)). The congress concluded with the [Melaka Call for Action](#), which appeals to national governments to enhance their support for local and subnational governments and commits to ten action points.

Tracking local progress on the SDGs at Resilient Cities 2016

Resilient Cities 2016 convened mayors and local government representatives to share their vision for implementing the Sustainable Development Goals at the local level. Three outcomes emerged from the discussions. First, an integrated approach for reporting progress on the SDGs is needed as local governments contribute to the full range of goals (not only 11) with actions on climate, biodiversity, education, inclusiveness, peace and partnerships, and more. Second, the SDGs should be interwoven with the New Urban Agenda and other global frameworks. One challenge ahead, particularly for the Paris Agreement, is identifying adequate indicators for local level implementation. Lastly, Mayors and senior leaders raised the possibility of building a third pillar in global debates that would bring together state actors (legislative and judicial) and non-state actors. It was agreed to further explore this approach with ICLEI partners and members.



James Nxumalo

Mayor eThekweni Municipality/
Durban
ICLEI First Vice President,
Co-Chair, Resilient City
Strategies (2011-2016)



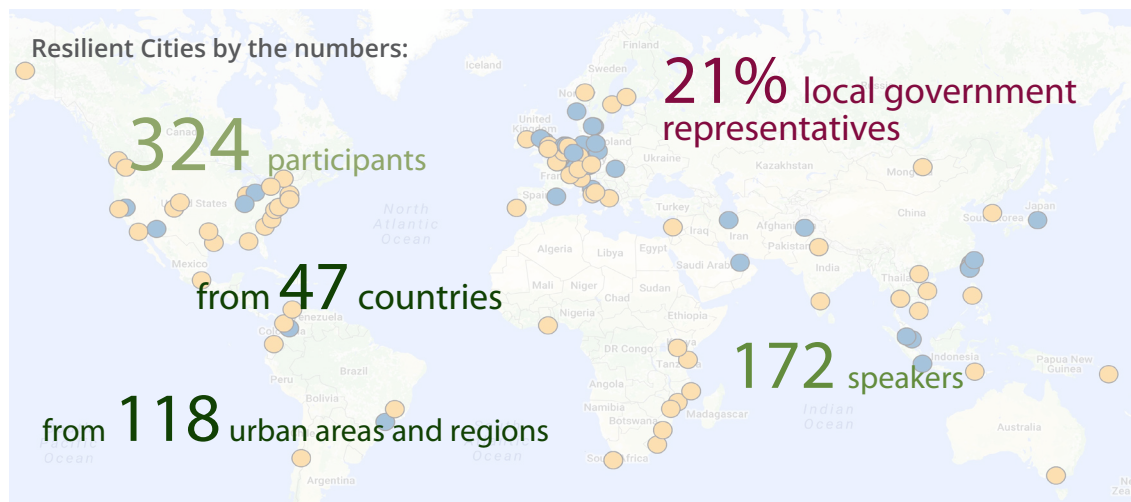
At the Mayors Lunch, July 6th, during the Resilient Cities 2016 congress in Bonn, Germany

Resilient Cities 2016 congress at a glance

Scene setting

On 6 – 8 July, Resilient Cities 2016 gathered over 320 participants – 21% of whom represented local governments – in Bonn, Germany. Participants discussed strategic approaches to the local implementation of the newly adopted global frameworks, innovative solutions to financing resilience, and best practices toward building a sustainable, inclusive and resilient urban future.

Representatives from over 200 local governments have attended Resilient Cities since 2010. The congress provides local governments the opportunity to share best practices and build partnerships through direct exchange with fellow cities and a community of international experts and resilience stakeholders, including the public and private sector, academia and researchers, and international and non-governmental institutions. From 2016, Resilient Cities also provides a platform for the annual review of local progress on the resilience targets of the Sustainable Development Goal 11.



Congress composition

- 28 thematic sessions including panels, presentations, workshops, and other interactive formats;
- 3 plenary sessions: “Post-2015: Taking stock and moving forward” (Opening Plenary), “Shaping a sustainable urban future: The view to 2030” (Summary and Outlook Plenary), and “Receiving urban refugees” (Special Plenary);
- 3 sub-plenary sessions: “Advancing global frameworks through local action”, “Inclusive and resilient urban development forum opening”, “Upscaling efforts to finance urban resilience and adaptation”;
- 2 thematic forums on Financing Resilience and Inclusive and Resilient Urban Development;
- High level discussions on the local implementation of global frameworks;
- 2 Reality Check Workshops featuring the cities of Can Tho and Da Nang in Vietnam, and Bangkok and Pakkret in Thailand;
- 12 posters presented during two dedicated sessions;
- 9 exhibitors present throughout the three days; and
- Special elements, including an Opening Reception hosted by the City of Bonn, a Mayors lunch, a High Level Dinner, as well as several side events and launches (see page 8).



Mayor of Bonn, Ashok Sridharan with Deputy Director General for Sustainable Development, Natural Resources, Economic Policy and Infrastructure, Federal Ministry of Economic Cooperation and Development (BMZ), Tania Rödiger-Vorwerk at the High Level Dinner on July 7th.

■ ■ ■ Congress side events and launches

Pre-event: 3rd Open European Day (OED): For the third time, the European Environment Agency (EEA) and ICLEI co-organized the [Open European Day \(OED\)](#) back-to-back with Resilient Cities. On July 5, over 120 climate change adaptation practitioners, including several local government representatives, exchanged best practices, ideas and innovative adaptation solutions for European cities. The day concluded with the launch of the EEA report "[Urban adaptation to climate change in Europe 2016: Transforming cities in a changing climate](#)".

Pre-event: Climate-KIC Matchmaker Workshop - "Connecting cities and investors for climate action": Organized as part of the [Climate-KIC's LoCaL program](#), CDP and ICLEI invited participants to a full day workshop on July 5 as a pre-event to Resilient Cities 2016. At the workshop, city representatives discussed selected applications to the [Transformative Actions Program \(TAP\)](#) with potential investors and outlined mutual priorities to fund these projects.

Launch: Global Adaptation Network's (GAN) Sponsored learning exchanges: On July 6, the [Global Adaptation Network \(GAN\)](#) launched its [Learning Exchange initiative](#) at Resilient Cities 2016. The GAN initiative is comprised of three sponsored learning exchanges among adaptation practitioners, including local governments, community-based organizations, NGOs and research institutes. Congress participants were welcome to apply to participate in one of the learning exchanges.

Launch and reception: New online Adaptation Options Catalogue for Practitioners: As part of this interactive session organized July 7 by the International Development Research Centre (IDRC) and ICLEI, urban resilience and adaptation practitioners had the opportunity to test the new [Adaptation Options Catalogue](#) and network with researchers whose projects are showcased on the platform. The launch was followed by an informal reception.

Launch: ICLEI's Community for Towns, Cities and Provinces of Small Island States: To support local and subnational governments in Small Island States, areas particularly vulnerable to climate change impacts, ICLEI launched the [Community for Towns, Cities and Provinces of Small Island States](#) on July 8. The new initiative aims to provide local leaders of Small Island States with access to critical information, support tools, and expertise to tackle the challenges of a fast changing climate environment. Following the launch, local authorities and potential partner organizations were invited to join the initiative.



Edward Ngava, Deputy Mayor, Honiara City Council, Solomon Islands

Science for cities: Key findings from the UCCRN ARC3.2 report and UCCRN Regional Hubs: This networking session organized by the [Urban Climate Change Research Network \(UCCRN\)](#) on July 7 highlighted key scientific findings from the [Summary for City Leaders](#) of the Second Assessment Report on Climate Change and Cities (ARC3.2), including the latest climate projections for 100 cities and a discussion of [ARC3.2 Case Study Docking Station](#). Knowledge-generating processes and next steps for the UCCRN Regional Hubs were also discussed.



At the UCCRN Co-event, July 7th

Un-Habitat's Guiding Principles for City Climate Action Planning: UN-Habitat and 45 endorsing partners, including ICLEI, launched the [Guiding Principles for City Climate Action Planning](#) during the Paris Climate Summit in 2015. Since Paris, these Principles, which aim to help cities effectively build climate resilience, have been tested in Vilankulo, Mozambique and Glasgow, Scotland. The Guiding Principles and main outcomes from the pilot cities were introduced during a co-event organized at Resilient Cities on July 7 and partners were invited to share their experience in climate action planning.

Key developments in urban resilience

This section summarizes the outcomes of the congress by subtheme and captures the state of urban resilience globally by exploring new developments and innovations. General messages from the congress discussions, as well as specific tools, city case studies, and solutions, are highlighted in the following pages and cross-referenced to additional information and online resources.

Inclusive and resilient urban development

The Inclusive and Resilient Urban Development forum, organized in cooperation with Cities Alliance, focused on how cities can work with the urban poor, including those living in informal settlements and working in the informal sector, to increase citywide resilience. Questions of secure housing, access to basic services, and inclusive governance were considered. The inclusive and resilient theme also linked to discussions on how to finance urban resilience – from the bottom up and from the top down – and how to advance local progress on the Sustainable Development Goals.

Good governance and participation

Achieving inclusive, safe, resilient and sustainable cities for all, as outlined in Sustainable Development Goal 11 and the New Urban Agenda, requires officials to recognize the interdependence of global goals and local actions and to follow an integrated vision for development and urban resilience-building. Such an approach demands a paradigm shift in the way governance structures are managed not only between national and local governments but also between local governments and their communities (including marginalized groups). In both cases, there is a tendency of the former to regard the latter as a burden rather than an asset and an integral actor for good governance. Nevertheless, besides encompassing effective leadership, jurisdictional coordination, land-use planning and efficient financing, a crucial aspect of good governance is inclusive participation (UN-Habitat, 2016b). Developing local knowledge and capacity while fostering local innovation for transformative adaptation and resilience building within cities could contribute to a global system change that is rooted in engagement with those who are most at risk.



Manuel Araujo, Mayor, Quelimane Municipality, Mozambique

The municipality of Quelimane, Mozambique promoted a participatory approach to develop its [Local Plan for Adaptation to Climate Change](#). Authorities, communities and other civil society organizations worked together with a self-assessment tool to identify medium and long term actions. In the USA, [Rebuild by Design](#) emphasizes collaboration between designers, researchers, community members and government officials. Based on existing social structures, the initiative provides funding for local community organizations to assist in outreach while investing in local expertise. In both cases, enhanced participation is empowering communities to contribute their ideas and gain a greater sense of shared responsibility and ownership in the resulting plans.

Partnering with informal communities and marginalized groups

[Participatory processes](#) also address power imbalances and exploitation, allowing the needs of disadvantaged communities to be heard and represented. Slum dwellers, who number 881 million worldwide, and informal workers are among the most marginalized and at-risk urban residents (UN-Habitat, 2016a). They are also a vast resource for mapping, analyzing, and reducing risks.

In Cameroon, a [Participatory Slum Upgrading Programme](#) has been applied in Yaounde, Bamenda and Kribi. Slum dwellers identified and analyzed key problems such as poor roads, precarious livelihoods, unsanitary conditions, insecurity of tenure, lack of services, and finally, high vulnerability to climate change and natural disasters. Resident associations were trained and encouraged to propose sustainable, local solutions and coping mechanisms. These ranged from simple infrastructure improvements to complete formalization of the settlements.

“Resilience is about empowering the local communities to be able to develop solutions by themselves and for themselves within their neighborhood. It is also about bringing everybody on board, that is, all stakeholders from the central government to local government then joining with the community in a kind of integrated strategy. As building resilience is a very long process it needs to be appropriated by communities.”

Sipliant Takougang, National Coordinator Urban Governance Programme, Ministry of Housing and Urban Development, Cameroon, Yaounde, Cameroon

In Accra, Ghana, where approximately 73% of economically active people work in the informal economy, [Women in Informal Employment, Globalizing and Organizing \(WIEGO\)](#) engages with local associations, advocates, and authorities to create a safe environment for the working poor, especially women. According to the [International Labour Organization](#), this type of social dialogue can promote decent work standards in urban areas and highlight an issue frequently neglected at the national level.

The [Know Your City campaign](#), a joint initiative between Shack/Slum Dwellers International (SDI), UCLG-A, and Cities Alliance, collects data from slum communities to inform inclusive, resilient development. In Kampala, Uganda, [ACTogether](#) organized forums where slum dwellers taught future urban planners how to gather and read data. Such initiatives are an empowering way to capture and legitimize local knowledge while changing mindsets towards slums and informality.



Sundaa Bridgett-Jones, Senior Associate Director, The Rockefeller Foundation, New York, USA



Vida Tangwan, Treasurer, Informal Hawkers' and Vendors' Association, Accra, Ghana

Lastly, eliminating discriminatory policies and attitudes is central to ensuring the needs of marginalized groups are effectively integrated (e.g. urban poor, informal workers, children, youth, women, LGBT, elderly, disabled, indigenous, refugees and internally displaced populations). Local governments must enable a certain degree of political organization to ensure multiple perspectives are represented. For example, [raising women's voices and issues](#) can identify specific gaps in policy and service provision and ensure governments are accountable to women's needs. Sensitizing the broader community to the perspectives of marginalized groups is also important to reorient priorities and attitudes and secure lasting change.

“You can't get people to organize around what you think they should organize, they will organize around what they want to organize”

Sandra Pepera, Director, Gender, Women, and Democracy, National Democratic Institute, Washington DC, USA

City Development Strategy version 2.0

For two decades, Cities Alliance has supported the creation of [City Development Strategies \(CDS\)](#). A CDS uses an action-oriented process sustained through participation to help cities visualize where they want to be in 20 or 30 years and how to achieve their goals with equitable growth and improved living conditions for all residents. Now, through the [Future Cities Africa initiative](#), Cities Alliance is adapting the approach to incorporate new focal areas including resilience planning. The CDS Version 2.0 will be available for a wide range of cities with varying developmental contexts, institutional arrangements, resources, and civic participation.

Financing resilience

Resilient Cities continued its focus on finance with its second Financing Resilience forum. The forum engaged local governments, insurers, investors, funding agencies and the private sector on the need for local capacity building to develop and implement sustainable and resilient projects. The sessions discussed new developments and resources for assisting local governments to identify investment needs, design bankable projects, and develop attractive project proposals. Innovative ways to mobilize and steer private and insurance investment for urban resilience was also discussed throughout the forum. The **Global Infrastructure Basel (GIB) Foundation** hosted the Financing Resilience Forum at Resilient Cities 2016 as part of the [GIB Summit Series](#).



Peter Baum, Analyst, Energy Efficiency and Climate Change, European Bank for Reconstruction and Development (EBRD), London, UK

The urban adaptation finance gap

Adaptation costs in developing countries are projected to range from USD 140 billion to USD 300 billion per year by 2030 and as much as USD 500 billion per year by 2050 (UNEP, 2016). In the meantime, an estimated USD 93 trillion is needed over the next fifteen years to construct low-emission and climate-resilient infrastructure (CCFLA, 2015). In both cases, costs will be concentrated in urban areas. Further investments will also be necessary to prepare cities for non-climate shocks and stresses.

These costs greatly exceed current spending: in 2014, only USD 25 billion was directed toward climate adaptation initiatives, including both urban and non-urban flows (CPI, 2015). This amount is already well below demand according to research like the joint [KfW and UN-HABITAT study](#) carried out in Katsina, Nigeria; Beira, Mozambique; and Bhubaneswar, India. The study demonstrates that existing funding and financing instruments are already insufficient to satisfy the high demand for energy efficient and climate resilient housing and infrastructure in these countries.



Carolina Cortes, Climate Change Chief Executive, CAF Latin American Development Bank, Quito, Ecuador

Increasing the availability and accessibility of urban adaptation funding and aligning funding agendas with local needs is urgently needed to close the gap between the current level of investment and that which is required.

Barriers to direct funding and investment

Steps have been taken to promote a paradigm shift with regard to the availability of funding. The Green Climate Fund and Adaptation Fund were established in 2010 and institutions including the World Bank, CAF, and foreign aid agencies have created dedicated resilience programs. Less has been done to improve accessibility beyond the national or regional level. Regulations governing multi-lateral and bi-lateral institutions do not allow direct access to funding for municipalities. In most cases, the transfer and management of funds is subject to national level approval and control. This may also apply to private investment in some countries.

One reason for these regulations is to safeguard against mismanagement, but they can also block deserving projects and prevent local communities from determining which actions are prioritized. Another reason is that small and intermediate sized cities are not considered credit-worthy and may struggle to meet fiduciary, social, and environmental standards set by funding institutions, both public and private.

Additionally, awareness of the various financial instruments and their requirements is relatively low among local governments, with many [lacking the technical or institutional capacity](#) to pursue direct funding opportunities when they do arise.

Creating an enabling environment for finance

A key message of the forum was the need to create an enabling environment for investment at the local level by reducing uncertainty and communication barriers. Investors and donors must have confidence in the people as well as the project. Therefore, municipal governments must demonstrate the capacity to manage funds effectively and provide a sufficient evidence base for the necessity and feasibility of the project. In addition, reconciling the different perspectives and priorities between sectors and establishing a common language is important for effective public-private-community partnerships.

"We need policies that enable more private sector investment in a way that supports the resilience agenda and we need to remove some of the policy barriers to create this more enabling environment for investment."

Josef Leitmann, Team Leader, Urban Resilience, GFDRR/ World Bank, Washington DC, USA

Ensuring good governance is an essential first step to reducing uncertainty. Good governance increases transparency, provides a basis for common understanding of policy and regulatory frameworks, and creates a necessary framework for recruiting and retaining qualified professionals. In this way, it legitimizes local governments as trustworthy and accountable actors. It also protects against public-private-partnership arrangements that would eliminate consultation processes or otherwise erode public accountability measures.

Second, local governments must be able to clearly demonstrate the value and feasibility of a project (e.g. sufficiently low risk and high return) to potential investors, donors, insurers, and stakeholders. For that, reliable data for climate risks are required (see page 14). Fortunately, risk analysis tools are increasingly available, such as the [Economics of Climate Adaptation \(ECA\)](#). With support from KfW, SwissRe and local partners, the ECA was applied in Barisal, Bangladesh and [San Salvador, El Salvador](#) to calculate expected damages from climate change in the coming decades, taking into account economic and demographic development. The methodology provided a tangible cost-benefit analysis to inform decision making and strategic investment for climate adaptation. An important consideration is whether the private sector is properly accounting for resilience. Businesses focused on financial losses over physical losses or assets over environmental context, for example, may underestimate the real value of resilience actions, warranting a reexamination of cost-benefit models.



Altanshagai Battulga, Senior Investment Analyst, Ulaanbaatar Development Corporation, Mongolia.

The city of Ulaanbaatar was in focus as a Transformative Actions Program (TAP) applicant at the Financing Forum workshop, July 7th

Selected tools and resources

- [Standard for Sustainable and Resilient Infrastructure \(SuRe®\)](#) - decision support tool which establishes a common language between project developers, contractors, financiers and local authorities to identify sound infrastructure investment opportunities. The SuRe® standard evaluates risks related to sustainability and resilience and provides guidance on how to manage these from a risk management and benefit creation perspective. Developed by Global Infrastructure Basel Foundation.
- [Transformative Actions Program \(TAP\)](#) - aims to bridge the finance and communications gap by serving as an intermediary between cities and funders. Local governments submit their resilience projects including social, environmental, governance, and financial data. The TAP offers support to improve project proposals and connects cities to relevant financial partners via matchmaking services such as the [Climate KIC initiative](#) (see page 8).
- [Investor Readiness Program](#) - The CTI Private Financing Advisory Network (PFAN) identifies promising projects at an early stage and provides mentoring through extensive coaching and guidance for development of a business plan, investment pitch, and growth strategy, significantly enhancing the possibility of financial closure.

A third challenge is overcoming communication barriers between local governments, donors, the private sector, and community members. Each group has a different understanding of “risk” and “resilience,” what is considered a climate resilient project or a development project, and even how to define project “bankability” and “feasibility”. Local governments may focus on environmental hazards and social impacts, for example, without addressing important questions about financial feasibility and risks. Including financial experts earlier in the planning stages can help to develop more attractive projects and proposals. Intermediaries or multi-sectoral collaborations can also help sensitize groups to differing perspectives and define “shared value approaches” which consider economic, social, and environmental returns.

Eliminating ambiguities and defining a common language enables cities to build an effective dialogue with community partners as well. The [CDKN and ICLEI Subnational Learning Programme](#) found that multi-stakeholder alliances were more lasting and effective when it was clear how each actor could and would like to benefit from the collaboration. This was true for public-private-community partnerships and broader socio-political coalitions that included marginalized and vulnerable citizens.

Integrated planning process for large infrastructure projects at city level

When underwriting emerging economy infrastructure projects, the finance sector (investors and insurers) often enters the project design process towards the end, even though it is exposed to the highest degree of long-term risk and has valuable expertise to contribute. This can often result in unsustainable, uninsurable infrastructure projects that fail to meet the needs of local communities. The [City Innovation Platform for African Infrastructure Risk and Resilience](#) hopes to develop a methodology that can support more bankable, insurable and sustainable infrastructure projects that actually meet the needs of local communities. CIP AIRR is an open and collaborative platform, due to be piloted in Dar es Salaam, Tanzania in 2016, that will bring together city officials with a cross-section of finance sector experts to help identify and promote viable solutions to major infrastructure challenges. The founding contributing partners include [ClimateWise](#), [ICLEI](#), [Global Infrastructure Basel Foundation](#), [UNEP FI PSI](#), [Santam](#), [Sanlam](#), [Marsh](#) and [Moody's](#).

Leveraging diverse financial resources and creative thinking

No single source of funding is sufficient to cover the anticipated costs of urban adaptation in the short and medium term. Cities should instead blend a mix of public and private funding from international, national, local, and community sources (e.g. loans, grants, bonds, microfinance, tax revenue, community lending, crowdsourcing etc.). Diversification spreads out risk for a more sustainable, locally-controlled strategy. Local governments can start with available resources (e.g. tax revenue, grants) to address immediate needs through smaller projects while building up the technical and institutional capacity to secure financing for larger projects. One solution is to pursue multifunctional infrastructure projects, leveraging the co-benefits from one investment (e.g. increased property values, improved services) to attract further investment (e.g. climate-resilient real estate development), reinvesting gains in a revolving fund and/or community resilience projects. In this sense, The [Ecological Sequestration Trust and Future Earth Ltd](#) proposes setting up a dedicated Urban Development Investment Fund (UDIF) in order to sustain finance for equitable green growth development.

Lastly, there is an increasing demand for forward-thinking programs that stimulate innovative approaches towards climate compatible development in cities. Some examples include experiment-driven labs – such as the [Global Innovation Lab for Climate Finance](#) which advances finance instruments while supporting the establishment of new markets and attracting new investors. The [EUROCLIMA Programme](#) of the European Commission intends to enhance access to funding instruments for local governments in Latin America by financing enabling studies, technical assistance, and promoting south-south cooperation.

“Resilience is not always associated with higher costs; it is rather an investment, associated with better thought through approaches. Taking resilience into consideration right from the beginning during design stage is key because then with less money, cities can be prepared for future risks”

Hans-Peter Egler, CEO, Global Infrastructure Basel Foundation (GIB), Basel, Switzerland

Case Study: Paris' Climate Adaptation Strategy

After facing an extreme heat wave in 2003 (over 1,000 casualties), the City of Paris developed a comprehensive [climate adaptation strategy](#) reflecting a “pragmatic” approach to resilience, especially when it comes to cooling during hot summer months. The key objective is to keep Parisians safe and adjust the urban space to fit the current and impending changes in temperature. For example, during heat waves, residents are allowed to walk in public fountains, an act normally forbidden in the City, while public parks are open 24/7 providing much needed cooling space for city dwellers.

Climate adaptive urban planning and investment in nature-based solutions are a core part of the adaptation strategy. Paris intends to plant over 20,000 trees, create parks, and at least one integrated “cooling pathway” by 2020. Lastly, the aim of the Strategy is to foster new lifestyles and boost city dwellers’ solidarity in times of extreme weather events. For example, adjusting opening hours for public services could help prevent accidents due to overcrowding and dehydration during peak hot hours.

“The adaptation strategy of Paris includes boosting solidarity as part of building resilience, [...] by promoting local people taking care of each other”

Marie Gantois, Leader on Climate Change Strategy, City of Paris, France

To finance some of these adaptation actions in 2015, Paris issued climate bonds that yielded over 60 million EUR from private funds. The City intends to continue this successful practice to finance low-investment, multi-benefit green infrastructure solutions, such as improving parks and planting trees across populated urban areas.

Researcher-practitioner-community collaboration

Reducing both the causes and effects of climate change begins with understanding how cities respond to climate shocks and deliver actionable information to local stakeholders, including government, institutional, and private partners.

Knowledge sharing and experimentation on effective methods of information delivery are essential for cities to fulfill their leadership potential for climate change mitigation, adaptation, and resilience. Several related initiatives were presented at Resilient Cities 2016. First, the [Urban Climate Change Research Network \(UCCRN\)](#) is establishing regional hubs that promote knowledge transfer for mitigation and adaptation within and across cities, especially small and medium sized ones, by fostering ongoing dialogue between local researchers, experts, communities, urban decision makers and stakeholders. The [Future Resilience for African Cities And Lands \(FRACTAL\)](#) project is also advancing this objective with a transdisciplinary approach to co-produce regional, non-academic and scientific knowledge through the joint development of research questions and methods. FRACTAL works with decision makers in several Southern African cities to integrate this expertise into climate-sensitive planning at the city-region scale.



Charlotte MacAlister, Senior Program Officer,
Climate Change Specialist, IDRC, Ottawa, Canada

In all cases, reliable data in varied, comprehensible formats are needed for evidence-based action. These may come from case studies, spatial data and analysis tools, or directly from the community (see page 10). The International Development Research Centre (IDRC), launched an innovative [online search tool and database](#) at Resilient Cities with an extensive collection of climate change adaptation options based on pre-existing projects (e.g. educational, behavioral, informational) accessible to a range of stakeholders and practitioners. The [U.S. Climate Resilience Toolkit website](#), managed by the National Oceanic and Atmospheric Administration (NOAA), also offers a user-friendly platform with tools and subject matter expertise for citizens and businesses to better understand their climate-related risks and opportunities.

Reality Check: Bangkok and Pakkret, Thailand

Located in the south of the Chao Phraya River Basin, the city of Bangkok is home to over 8.2 million people and is the largest city in Thailand, dominating in terms of urban growth. Pakkret, with a population of 179,000 is Thailand's third most populous city and a part of the Bangkok Metropolitan Region.

Both urban centers are situated on the central Thailand floodplains and experience an annual rainy season from May to October and a dry season from November to April (Swiss RE, 2012). Climate change is projected to cause more frequent and intense floods and droughts in the region. While the La Niña phenomenon in 2011 brought about an early onset of the rainy season resulting in a one-hundred-year flood event across Thailand, the El Niño of 2015 and 2016 affected the country with drought.



View of Pak Kret Pier © By Heron2 (Own work), 2008 via Wikimedia Commons

Climate change impacts in the Bangkok Metropolitan Region are exacerbated by land subsidence of 1cm per year and a coastal erosion rate of 5-14m per year (World Bank, 2009). In addition, mismanagement of water resources, drainage and land use problems, as well as inefficient solid waste and wastewater management compound existing risks and vulnerabilities.

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Resilience planning responses following the 2011 Flood

The 2011 flood inundated 66 of the country's 77 provinces, claiming the lives of 813 people (Swiss RE, 2012) and causing damages of 46.5 billion USD (World Bank, 2012). The Bangkok Metropolitan Region was severely impacted. Large industrial zones like [Nava Nakorn](#) experienced major losses and have since invested significant amounts in flood recovery and prevention. The [Royal Irrigation Department \(RID\)](#), responsible for water resource management, also responded with structural measures to protect important industrial centers from devastating flood events.

Bangkok

In the aftermath of the crisis, the central government developed a [Flood Management Master Plan for the Chao Phraya River Basin](#). The Bangkok Metropolitan Administration (BMA) constructed flood walls, additional dikes, and expanded the network of drainage tunnels. The city also increased the amount of water retention ponds, known as "Monkey Cheeks", a term first coined by the late King Bhumibol Adulyadej as a reference to a monkeys' habit of storing food and water for later use. BMA also focused on canal dredging and cleaning, as floating garbage significantly obstructed waterways during the 2011 floods. In collaboration with the Japan International Cooperation Agency (JICA), BMA is currently developing the [Bangkok Master Plan on Climate Change 2013-2023](#), while a [research project](#) supported by the International Development Research Center (IDRC) aims at improving the existing Flood Management Master Plan by providing policy recommendations on water resource management.

Pakkret

Surrounded by canals, Pakkret Municipality is particularly vulnerable to floods. However, with the help of its integrated flood management referred to as the "[Pakkret Model](#)", the city remained largely dry during the historic 2011 floods. The key to the Model's success is early preparedness and unwavering community engagement. The municipality had flood prevention infrastructure in place ahead of the crisis, as well as a Flood Assistance Center and a participation plan to engage community members in disaster risk reduction activities, such as constructing makeshift embankments from sandbags. The municipality's plan is to continue strengthening its social capital and to create flood risk maps.

Challenges identified

Dam mismanagement is held responsible for the severe impacts of the 2011 flood, following failure to release water in time, as well as the 2015-2016 droughts, due to failure to conserve adequate amounts of water for the dry season. The River Basin Committee is inefficient in managing water resources and land use as it lacks the authority for implementation and is disconnected from the national-level committee and the various water user groups. The primary focus of the RID, BMA and key private sector actors remains physical infrastructure while investments in “soft adaptation” measures are neglected.



Pusadee Tamthai, Deputy Governor, Bangkok Metropolitan Administration, Thailand

Solutions identified and being pursued

- Decentralized area-based water management system and expanded mandate for the Chao Phraya River Basin Committee;
- Closer collaboration on water management between the private sector, academia, central government, and local communities;
- Non-structural solutions, including effective early warning systems, disaster risk preparedness training (e.g. swimming lessons), and accurate information dissemination on precipitation levels and dam capacity;
- Action Plan on Drought Management and promotion of water conservation measures;
- Investment in efficient solid waste management and promotion of behavioral change toward waste disposal.



City of Bangkok by night © Wulf, 2012

Water-related impacts of climate change in cities

Efficient management of water resources is becoming increasingly important for urban areas hit by successive floods and droughts (see Reality Check Workshops page 15 and 17) due to changing temperature and precipitation patterns. Strategies focused on water conservation and tackling salinity intrusion, which contaminates potable sources and peri-urban agricultural areas, are required for cities to maintain water security during droughts (see page 19 for Beirut case study).

For those facing recurring floods, investment in the construction and maintenance of water as well as waste management infrastructure is a crucial part of urban disaster risk management. Poor solid waste management can worsen the burden of urban flooding by blocking drainage and creating fertile ground for vectors (including the *Aedes Aegypti* mosquito responsible for spreading the dengue and Zika fever - see page 19 for Tainan's response to a dengue fever outbreak in 2015). Hence considerations of water and solid waste management should be inseparable from urban adaptation strategies.

A major challenge in implementing appropriate water management strategies is the lack of financing and regional collaboration. Oftentimes the problems faced by the individual cities stem from transboundary water management failures (see page 17).

Reality Check: Can Tho and Da Nang, Vietnam

Situated on the Hau River, distributary of the Mekong River, Can Tho is the fourth largest city in Vietnam and the largest in the Mekong Delta with a population of over 1.2 million. Da Nang is by the Hàn River on the coast of the South China Sea in central Vietnam and ranks as the sixth largest city with a population of over 1 million.

Both cities have a typical tropical climate expressed in two seasons – rainy and dry – and are vulnerable to floods, droughts, heat waves, storms, and salinity intrusion. For example, in 2016, when Southeast Asia was hit by the [worst drought in nearly a century](#), the cities and their surrounding agricultural areas were severely impacted. As the rivers dried up, saltwater advanced inland contaminating the drinking water and damaging crops. In the future, the cities are projected to encounter increased temperature and sea level rise, as well as frequent floods in the rainy and droughts in the dry season. Poor drainage systems, low elevation and subsidence due to groundwater extraction intensify water-related challenges in the cities.

Apart from vulnerability to climate change, the cities also have experienced a high rate of urbanization and economic development in recent years – a combination of conditions that has earned Can Tho and Da Nang considerable international attention around their resilience building efforts.



Can Tho riverside © Pham Ngoc Phung, 2016



Da Nang city view © CCCO Da Nang, 2016

Resilience strategies and actions

In 2010, Da Nang developed its [Action Plan](#) to respond to climate change impacts by 2020. Soon after, the city established its [Climate Change Coordination Office \(CCCO\)](#) and launched the [Storm Resistant Housing project](#), a flagship initiative which earned Da Nang an award at the UN Climate Change Secretariat's Momentum for Change 2014 competition.

The project helped over 245 lower income households rebuild their homes through a revolving fund scheme administered by Da Nang's Women's Union. The city also conducted a comprehensive assessment of its water resources to inform water management decisions and has undertaken urban consolidation actions to limit urban sprawl. Early in the planning phase, Da Nang (and Can Tho) implemented [a project supported by IDRC](#) to assess stakeholders' understanding of climate and water-related risks and design a communication strategy to disseminate relevant information.

After setting up its [CCCO](#), Can Tho developed a Climate Change Communication Handbook and a [Climate Change Strategy for the period 2015- 2030](#). The city is applying [active water management governance](#) with non-structural solutions including capacity building, a water resources database, and an early warning system, as well as structural solutions based on three annual scenarios. For a "normal case" scenario, a system of decentralized reservoirs is foreseen; for a "deep flood" scenario, "room for rivers" constructions are activated; and for a "drought" scenario, the city is exploring options for seawater desalination and water recharging for the aquifer.

Gaps and challenges

In **Can Tho**, poor upstream/downstream water management can be responsible for the intensity of floods and droughts experienced. The water regime in the Mekong Delta is a complex issue, influencing water security for several riparian communities. Transboundary waters are currently not regulated by a regional body with legal authority.

In **Da Nang**, the spatial master plan, designed to accommodate urban growth to up to 2.5 million by 2050, fails to address flood risks. As a result, [a new development \(Hoa Xuan\)](#) was recently built on traditional flood plains with looming future consequences.



Minh Quy Phan, Coordinator, Da Nang Climate Change Coordination Office and Project Coordinator of the 100 Resilient Cities Project, Da Nang City, Vietnam

"The river (Mekong) has always been there. We have to evolve with the river!"

Glen Kuecker, Professor, DePauw University, Greencastle, USA

Solutions identified

- Advocate for legally binding regulations and a centralized water management system for the Mekong River, similar to the [Volta Basin Authority](#);
- Invest in green and adaptive infrastructure, such as green corridors, buffer zones, and elevated constructions, particularly in Da Nang's Hoa Xuan area;
- Reinject the aquifer with treated wastewater to decrease subsidence and developing a conservation policy that controls groundwater exploitation and promotes the use of surface water and reuse of treated wastewater;
- Prepare for large scale rainwater harvesting for the dry season;
- Integrate latest research and local knowledge into resilience strategies to build lasting, evidence-based solutions addressing slow onset shocks and stresses.

Resilient city-region food systems

Food issues are increasingly on the local and national sustainability agenda

Agriculture and food security are still largely viewed as issues for rural areas and national governments, as evidenced by the fact that urban resilience targets and food security targets are anchored in separate SDGs (SDG 11 and 2 respectively). Yet the recognition that resilient food systems are primarily an urban matter has gained momentum in recent years. This recognition is demonstrated in declarations such as the [Milan Urban Policy Pact](#), signed by over 100 cities from around the world in October 2015. The Pact acts as an operational tool to help local governments attain resilient, sustainable, and equitable food systems.

Strengthening urban food systems is also increasingly on the sustainability agenda for local and national actors, especially ahead of the Habitat III Conference. As a cross-cutting issue, it should be incorporated into the New Urban Agenda (NUA) and can also serve as an entry point for cities to work toward other SDGs. For example, food security and provision are linked to goals such as waste management, water management, and poverty reduction.

"An urban food agenda is desperately needed. Not only will the urban population benefit, but also the peri-urban and rural population."

Stefan Schmitz, Director, Food, Agriculture and Rural Development, Federal Ministry for Economic Cooperation and Development (BMZ), Bonn, Germany

Combating saltwater intrusion in Beirut, Jordan

[Beirut](#) is facing harmful levels of seawater intrusion from the Mediterranean into its groundwater aquifer. Higher temperatures coupled with less rainfall for longer periods are leading to extensive groundwater abstraction. As the aquifer is not being properly recharged with freshwater, denser saltwater is allowed to move inland. This can cause contamination of drinking water, with impacts for individuals (i.e. degradation and corrosion of household appliances and infrastructure, health issues) and agriculture (i.e. crops types, yield, and costs).

Two years of intensive field research with samples taken during wet and dry seasons was carried out with the support of IDRC to verify the water quality and identify the biggest contributor to saltwater intrusion. A comprehensive framework for adaptation measures was then developed together with a decision support system. The framework addressed three main spheres: water supply management, awareness raising among end users, and improved institutional collaboration. For the first, recommended adaptation measures included water collection for aquifer recharge, rainwater harvesting, and water reuse. Meanwhile, public hearings and publications regarding water conservation, smart metering systems, tariff restructuring, and supply network efficiency (identifying leakages or informal water connections) helped to disseminate information to communities and water industry stakeholders.

Finally, collaboration and cooperation between different stakeholders was improved with a decision support system that allowed for cost-benefit analysis. The system guides investments in adaptation measures to offset losses for coastal communities, improves understanding of additional risks and potential further impacts of saltwater intrusion, and informs development of groundwater management and planning strategies.



Shih-Chung Liu, Deputy Secretary-General, Tainan City Government, Chinese Taipei

Water-related health risks: Responding to dengue fever in Tainan City, Chinese Taipei

Although the occurrence of dengue in Tainan City, Chinese Taipei has been averaging 263 cases per year in the past 15 years, in the summer of 2015 the City recorded more than 20,000 cases and 100 deaths (Centers for Disease Control, 2016). The outbreak was caused by a series of extreme weather events – severe drought followed by heavy rains and two major typhoons – which created highly favorable conditions for mosquitoes. Having underestimated the risk, [the City](#) did not take early action against the proliferation of the *Aedes Aegypti* and were initially unprepared for the epidemic that followed.

As the number of dengue cases rose, command centers were established to promote inter-agency coordination and to provide trainings for volunteers, educational activities for students, medical workshops, and constant district-by-district monitoring and evaluation. The use of open data together with conventional and social media platforms highlighted the relevance of co-produced data and analysis for informed decision-making.

A bottom-up campaign led by village heads and volunteers advanced efforts to eliminate mosquito larvae by inspecting and cleaning households, vacant land, and abandoned infrastructure with breeding sites for the mosquitoes. Meanwhile, more resources, equipment and health professionals were allocated to Tainan City. Agreements with regional hospitals were established to provide free testing and special medical treatment for dengue fever patients with immediate diagnosis and reporting.

With concerted efforts, the rate of new cases started to drop steadily, with less than 10 cases observed in the last months of the year. Tainan owes its success to effective collaboration between the local government and the communities and to a combination of top-down policy instructions and bottom-up community initiatives. Based on the experience of 2015, the City was well-prepared for the rainy season of 2016 and was able to avoid an outbreak and keep the dengue cases during these months on average below 1 case (Centers for Disease Control, 2016).

City-region links for food security

Urban food security depends on the surrounding rural areas, which are, in turn, impacted by urban growth. Therefore, it is important that measures to strengthen urban food systems are embedded in national legislation and instituted through close collaboration between cities and rural areas, as well as between different levels of administration. [Metro Vancouver](#) is determined to continue growing its urban area, but plans to structure the growth. Core strategies, outlined in the newly developed [Regional Food System Action Plan](#) are protecting agricultural land and producing local, culturally-diverse food, as well as supporting education and capacity building for people most vulnerable to food insecurity.

In many cities, food insecurity exists beside food waste. This paradox exposes unequal access to food among urban dwellers. By strengthening the role of food systems' planning in urban policy and resilience-building, cities can more effectively deliver on environmental and social aspects of resilience. For example, [Île-de-France](#), the French region that includes the City of Paris, and the [Medellin Metropolitan Area](#) have encouraged the development of "social supermarkets" and food banks, respectively. These institutions offer food at low prices or give away food close to expiration date to the urban poor. Medellin has also successfully applied FAO-RUAF's [City Region Food System \(CRFS\)](#) assessment and indicator framework. This participatory tool allows cities to map their food systems to see where the food comes from and how waste is generated in order to prioritize actions and investments. Another such tool is IUFN's [food strategy self-assessment tool](#), which supports cities to build sustainable food systems and improve the livelihoods of urban dwellers.

Recommendations for building resilient urban food systems across the world

- Incorporate the "Right to Food" in subnational legislation;
- Use policies that encourage urban agriculture and local consumption to reduce food insecurity and support climate action targets;
- Design local policies and strategies to address food waste;
- Educate consumers on food consumption and waste;
- Regulate urban expansion into agricultural peri-urban areas;
- Collaborate across city departments and government levels for effective implementation;
- Develop local incentives (tax reductions, discounted leases, and public space) for private sector participation;
- Include resilient city-region food systems in the NUA by their own right.



Barbara Steele, Director, Metro Vancouver Board of Directors; Councillor, City of Surrey, Canada



Stefan Schmitz, Director, Food, Agriculture and Rural Development, Federal Ministry for Economic Cooperation and Development (BMZ), Bonn, Germany



Sara Valencia Naranjo, Projects Acquisitions Expert, Agency for Cooperation and Investment of Medellin and the Metropolitan Area, Medellin, Colombia

New urban governance in light of forced migration

The issue of forced migration, though not new, has recently tested local governments' preparedness and resilience capacity in countries impacted by the Syrian refugee crisis. Far from an isolated incident, this crisis highlights an issue that demands further attention and support in future years. Resilient Cities 2016 featured [a special plenary](#) to shine a spotlight on challenges and good practices for cities receiving forced migrants.

According to UNHCR, an unprecedented 65.3 million people were forced from their homes by the end of 2015 including refugees, Internally Displaced People (IDPs) and asylum seekers (UNHCR, 2015). All three groups are considered "forced migrants", individuals coerced to flee within or across national borders due to disaster or conflict (IOM, 2015). Many settle in cities for easier access to healthcare, better education, and employment opportunities. Such "urban refugees" accounted for roughly 60% of forced migrants in 2015 (UNHCR, 2015). Forced migration is therefore a decidedly urban issue. Urban refugees are confronted with a multitude of challenges, often including poverty, disaster risk, social exclusion, and xenophobic violence. Forced migration can have ripple effects on urban societies, as population, economic, cultural and environmental changes occur. Challenges arise in terms of urban infrastructure, housing and provision of basic services, but opportunities are also presented to increase economic development, urban diversity and overall resilience.

During the emergency phase of refugee movement into Germany in 2015, the [international City of Bonn](#) rose to the challenge by applying a people-centered approach. With approximately 150 new arrivals per week, the City improvised by dedicating schools and gyms as refugee shelters. The long-term strategy, already in motion, seeks to decentralize accommodation (avoiding segregation) thereby enabling new arrivals to become part of Bonn's everyday life, and focuses on education, integration, and job creation. The City actively encourages local employers to consider refugees as assets to their business. Civil society and community engagement are the cornerstones of Bonn's success.

Mobilizing the receiving communities' compassion is a powerful tool that can speed up newcomers' integration into society and economy and hence accelerate their contribution to the city's resilience and sustainability efforts. Alfredo Zamudio stressed the importance of social cohesion, compassion, and political will for the successful integration of urban refugees. Areas with more inclusive, equitable societies and strong social protection measures are better able to absorb influxes of migrants and are themselves less vulnerable to the drivers of displacement. When integrating refugees, local governments should offer a calm voice and respectful approach. Listening to affected communities is important to understand their needs, concerns, and how they can support each other.



Keynote speaker Alfredo Zamudio, Director, Nansen Center for Peace and Dialogue, Lillehammer, Norway

"Through random acts of kindness one can foster positive change!"

Alfredo Zamudio, Director, Nansen Center for Peace and Dialogue, Lillehammer, Norway

Positive change is the result of combining capacity, knowledge, and political will. The unparalleled influx of forced migrants was dubbed as "crisis" in Europe, although Europe hosts only 6% of the world's forced migrants, with the majority located in the Global South (UNHCR, 2015). Putting the "crisis" into perspective can strengthen the social fabric of western urban societies, where capacity and knowledge are sufficient, and turn international attention and resources to areas where these components are missing.

Reducing vulnerability with improved energy efficiency and security

The value of energy efficiency and energy security is often underappreciated in urban resilience strategies. Efficient energy use means consuming less energy to provide the same service. This contributes to a more secure energy supply, which means more affordable, reliable and robust provision in spite of external shocks or stresses (International Energy Agency, 2016). These benefits reduce community vulnerability to socioeconomic and climate-related risks.

[Energy efficient buildings](#), for instance, allow residents to remain indoors longer when electricity for heating or cooling is cut off and outside temperatures reach hazardous levels. High-performance buildings maintain a stable temperature and can thus serve as a shelter in times of emergency. In addition, extreme temperatures often lead to increased heating and cooling costs, with low-income households being most severely impacted. Energy efficient buildings help mitigate these shocks by preventing spikes in energy consumption during emergencies. [Melaka](#) is one example of a city investing in energy efficient construction using Energy Performance Contracts in order to support resilient green growth strategies.

The [City of Turku](#), Finland has put forward an innovative two-way district heat solution to the [Transformative Actions Program](#) (TAP). Centralized and decentralized energy production is combined and house occupants become prosumers, both generating and consuming energy. Various investments are required for the project to be realized, but once implemented; it will be able to provide a reliable supply to 8,000 people, highly relevant during the winter season.

■ ■ ■ Outlook for 2016

Resilient Cities 2016 highlighted key developments in the “post-2015” field of urban resilience. Researchers are responding to calls for more accessible, digestible climate research with new knowledge-sharing platforms, networks, and funded exchange opportunities that offer centralized, but diverse information for various contexts. Good practice for resilient urban food and water management systems continues to emphasize coordinated city-region partnerships and a mix of “hard” and “soft” interventions. Participatory and gender-sensitive governance approaches are progressively bringing disadvantaged voices into the climate-resilient development debate. However, further work is needed to shift mindsets and enable truly inclusive resilience planning. Finally, efforts to create an enabling environment for investment and more direct access to financing at the local level must be urgently expanded in order to close the adaptation finance gap.

Addressing the local governance and capacity gaps identified in the areas above will be needed to achieve the ambitions of the post-2015 global frameworks, including the New Urban Agenda. In parallel, multi-level cooperation is needed to enact the broader political and financial reforms necessary for more equitable and climate resilient urban development.

[Resilient Cities 2017](#) will continue to explore solutions for financial and governance challenges, as well as the relationship between socio-economic and climate risks. Emerging resources for creating city level data, knowledge, and monitoring systems in support of local implementation of global adaptation and resilience goals will also be in focus. Finally, the congress will seek to expand understanding on how local governments are preparing for climate-related health risks and unavoidable loss and damage.

Resilient Cities' articles and publications:

- [Resilient Cities Report 2015: Global Developments in Urban Adaptation and Resilience](#)
- *"Participatory resilience in informal settlements"* (in Crisis Response Journal, March 2016 Issue 11:3)
- *"Three things cities must do to finance resilience"* (in Cities Today, Issue 21, June 2016)
- *"Urban resilience: People, not technocrats"* (in Crisis Response Journal, September 2016, Issue 12:1)

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Save the date!



8th Global Forum on Urban Resilience and Adaptation 4 - 6 May 2017 | Bonn, Germany

The congress will continue to explore governance and finance challenges and opportunities in the way of building urban resilience and driving forward the implementation of global frameworks at the local level. See resilientcities2017.iclei.org for the latest updates.

The call for contributions remains open until **1 December 2016!**

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

Supporting partners



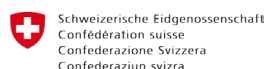
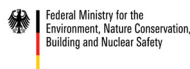
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