



3rd Global Forum on Urban Resilience and Adaptation

Congress Report 2012

Preliminary version



**NACHHALTIGKEIT.
SUSTAINABILITY.
DURABILITÉ.
BONN.**



Resilient Cities 2012: Congress Report

The publication shall be cited as: "ICLEI, 2012, Resilient Cities 2012: Congress Report"

Authors: Alice Balbo, Maarten De Cock, Emily Dowding-Smith, Steve Gawler

Editing: Alice Balbo, Maarten De Cock, Emily Dowding-Smith

ICLEI World Secretariat

ICLEI - Local Governments for Sustainability e.V.

Kaiser-Friedrich Straße 7

53113 Bonn / Germany

publications@iclei.org

www.iclei.org

All rights reserved

© ICLEI e.V. 2012

The material of this publication is copyrighted. Requests to reproduce whole or parts of it must be addressed in writing to ICLEI - Local Governments for Sustainability, World Secretariat. ICLEI encourages the active dissemination of its work. Permissions to reproduce will normally be granted promptly without charge, when the reproduction is for non-commercial purposes.

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. Based on the congress proceedings, this publication summarizes key issues affecting cities, local governments and stakeholders around the world.

More information on the Resilient Cities congress series is available at

www.iclei.org/resilient-cities

Key messages from Resilient Cities 2012

Proven **disaster risk reduction** approaches can guide cities in resilience planning. [Pages 5 and 8](#)

Much can be learned from **community-based risk assessments**. Local stakeholders and vulnerable population groups must be incorporated, such as the urban poor and children. [Pages 8 and 11](#)

We simply must **work together**: between stakeholders, within communities, across local government units, and also internationally. [Pages 11 and 15](#)

Cities must assess risk and vulnerabilities from a **systems perspective**, and accordingly, integrate solutions into all aspects of city management. [Pages 13 and 15](#)

Urban development must be guided in a resilient direction by adapting land-use plans and building regulations. [Page 13](#)

Tools are becoming increasingly available to assist local governments with adaptation policy making. [Page 13 and 19](#)

Including the **private sector** is indispensable for financing adaptation measures, while a resilient city is more attractive for investors. [Pages 15-17](#)

A **green urban economy** creates jobs and makes the city a more attractive place to live and work. [Pages 15-17](#)

Cities are still having difficulties to access international and national funds for **financing resilience**. These should be more directly linked to the needs of cities. [Pages 15-17](#)

Logistics need to be incorporated into adaptation planning and should be incorporated in all phases of disaster risk reduction and resilience planning. [Page 9](#)

Urban agriculture is needed to provide food security, contributing to a city's overall resilience. [Page 10](#)

Green infrastructure is showing its potential for mitigation and adaptation and built infrastructure is being designed in more resilient ways. [Page 15](#)

We are seeing **progress on the ground** in adaptation planning and implementation in cities around the world. [Pages 12, 14, 16, and 18](#)

National governments should create flexible supporting frameworks that cater to local adaptation needs and build capacity at the local level. [Page 17](#)

Significant **political will** is needed within local governments for cross-sector enforcement of adaptation plans. [Page 17](#)

The **social aspects** of urban resilience and the link to poverty alleviation need to be further explored. We must work with the most vulnerable groups. [Page 20](#)

Resilient Cities 2012 at a glance

371 participants from 44 countries

217 speakers from 5 continents represented

62 local government representatives from 26 cities

"I enjoyed the wide variety of topics and the good mixture of people. I think the resulting interaction between sciences, practice and the private sector is quite unique"

Eva Nemcova, Research Assistant, University of Stuttgart



Scene setting

The 3rd edition of the Global Forum on Urban Resilience and Adaptation to Climate Change (Resilient Cities 2012) brought over 370 participants and 200 speakers to Bonn, Germany. It was held under the patronage of Joan Clos, Executive Director of UN-Habitat; Margareta Wahlström, Special Representative of the Secretary-General for Disaster Risk Reduction of The United Nations Office for Disaster Risk Reduction (UNISDR); and Norbert Röttgen, former Federal Minister for the Environment of Germany.

Over a three day period, local governments, international and non-governmental organizations (NGOs), researchers, and the private sector, came together to exchange ideas on how to make cities more resilient and adaptive to climate change, while the global climate community was also in Bonn for the United Nations Framework Convention on Climate Change (UNFCCC) Climate Talks.

Congress composition

- 24 theme sessions
- 3 plenary sessions: Opening plenary, "Financing the Resilient City", and the Summary and Outlook plenary
- 4 Reality Check Workshops: Cities featured were: La Paz, Mexico; Sorsogon, Philippines; Copenhagen, Denmark; and Ancona, Italy.
- 19 poster presentations in two dedicated sessions
- 2 Forums: Resilient Urban Logistics and Urban Risk
- 2 Kick-off sessions: Urban Agriculture and Resilient Building and Construction
- A two day interactive platform connecting young researchers with experienced practitioners
- 5 special networking sessions and 4 coffee break launches of publications and tools

Importance for local governments

Learning from experts around the world, and from other cities, is important for local governments. Most cities obtain information on climate change adaptation by meeting with other cities and attending conferences (MIT Report). After three successful global forums on urban resilience and adaptation, ICLEI continues to lead in building capacity and interdisciplinary knowledge at an international stage for all actors in urban adaptation and resilience. This highlights the value added by exchange platforms such as the Resilient Cities congress series, as cities continue and advance their work on adaptation and resilience.

"Cities need to build resilience, not only to climate impacts but to all kind of potential shocks and crises"

Konrad Otto-Zimmermann, ICLEI Secretary General and Congress Chair

Congress rationale

Resilience at the local level

Urban systems and communities need to be able to withstand stress and survive, adapt, and bounce back after a crisis or disaster and, importantly, move on. The capacity and ability to do this is a city's resilience. Water, food, energy, infrastructure, flows of goods and services, and health and safety, can all be affected when extreme events occur (like earthquakes or tsunamis) and a city is tested. So when more frequent impacts of climate change are felt at a greater intensity and rate (such as flooding or storm surges), the city must also be prepared and ready to adapt. As illustrated

at Resilient Cities 2012, there are key overlaps between adaptation planning and disaster risk reduction (DRR). As a development approach, however, resilience goes beyond climate adaptation and the risk-oriented approaches of DRR. Cities must now, in addition to taking a long term view of sustainability, prepare themselves to be more resilient. They must capture the synergies between sustainability planning, DRR, and resilience, and mainstream plans and policies into all aspects of urban development. The need for cities to proceed in this manner is the underlying theme of the Resilient Cities congress series.

Defining resilience

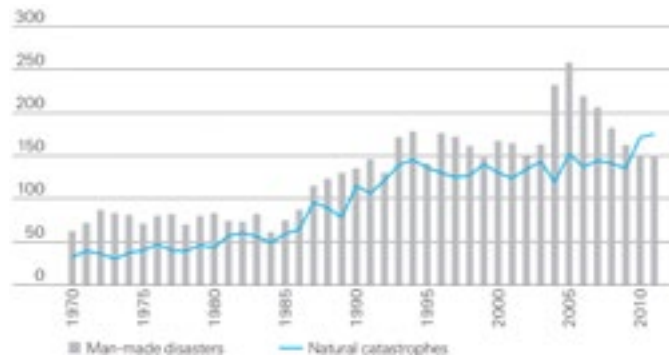
Resilience is the capacity and ability of a community to withstand stress, survive, adapt, bounce back from a crisis or disaster and rapidly move on. Resilience needs to be understood as the societal benefit of collective efforts to build collective capacity and the ability to withstand stress (ICLEI, 2011).

Disasters in 2011:

Financial losses: \$ 8 billion due to man-made disasters compared to \$ 362 billion for natural disasters.

Loss of life estimation: 6, 000 for man-made disasters versus 29,000 for natural disasters.

Total number of natural and man-made disasters in 2011
Source: Swiss RE (2012)



Natural disasters and losses in 2011

Globally, natural disasters (e.g. earthquakes, floods) and man-made disasters (e.g. armed conflict) led to economic losses of \$370 billion in 2011, the highest amount ever recorded, and claimed more than 35 000 lives. This was a significant increase over the \$226 billion in 2010, but fortunately the number of lives lost decreased tenfold (largely because of the high death toll of the Haiti earthquake in 2010).

The majority of losses, \$254 billion, were uninsured losses. This leaves individuals, companies, and governments (including local governments), financially vulnerable to disasters. Most of the losses in 2011 arose from the earthquake in Japan, with \$210 billion in damages and 19 000 dead, followed by the earthquake in New Zealand, the flood in Thailand, and the record-breaking tornado season in the United States.

The share of climate related events in natural disasters remains high. The Thailand floods, damaging the global supply chain from Bangkok in electronics, and amounting to the highest freshwater flood loss ever recorded, pointed to the importance of cities for the interconnected global economy. With international climate negotiations barely producing results, and climate change expected to reach a tipping point, cities around the world must continue to take action and prepare for climate change effects, in order to be resilient in the face of these potential damages and losses. Local authorities are in a unique position to take the lead and implement measures for increasing resilience globally, through local action.

"If we don't do this work right now then the insurance costs are going to be staggering."

David Cadman, ICLEI President

Developments from 2011 to 2012

Partnership

For the 2012 edition, Resilient Cities teamed up with key solution partners Global Energy Basel (GEB) and Deutsche Post DHL to host a number of key forums and sessions throughout the congress. By bringing their expertise to the table, these partners helped to strengthen and broaden the discussion on resilience.

Publications

The Resilient Cities 2011 Congress Report including key outcomes of the 2011 edition of Resilient Cities was released, providing a detailed summary of the event.

The Resilient Cities proceedings 2011 have been published in the Springer series "Local Sustainability": "Resilient Cities 2: Cities and Adaptation to Climate Change – Proceedings of the Global Forum 2011". The book showcases numerous case studies and examples of adaptation from the 2011 congress, providing unique insights from local governments, public institutions, researchers, and NGOs.

Two articles in the Crisis Response Journal have been published, in Volume 7, issues 2 and 4. The first article dealt with the role cities can play in adapting to climate change, and the specific challenges and opportunities they face. The second article highlighted the need for cities to protect their crucial infrastructure, the backbone of their functioning, and looked into the ways of doing this.

Governance

The *Durban Adaptation Charter for Local Governments* (Durban Adaptation Charter) was adopted on 4 December 2011, by 114 mayors from 28 countries around the world, underlining their commitment for strengthening local resilience to climate change and complementing the Global Cities Covenant on Climate – the Mexico City Pact. By signing the Durban Adaptation Charter, the local governments committed to unprecedented levels of local climate action.

The mayors presented the Durban Adaptation Charter to the negotiators of the 17th Conference of the Parties (COP17) to the UNFCCC, with a plea to take the role of local governments and local climate action seriously.

"We take the straw men that are put up by national governments for not doing things and knock them down. We show how we can do things."

David Cadman, ICLEI President

Durban Adaptation Charter commitments:

- Mainstream adaptation as a key informant of all local government development planning;
- Ensure adaptation strategies are aligned with mitigation strategies;
- Promote the use of adaptation that recognizes the needs of vulnerable communities and ensures sustainable local economic development;
- Prioritize the role of functioning ecosystems as core municipal green infrastructure; and
- Seek innovative funding mechanisms.

Finance

The ICLEI Global Report, "*Financing the Resilient City: A demand driven approach to development, disaster risk reduction and climate adaptation – An ICLEI White paper*", (Global Report) launched at Resilient Cities 2011, was presented in several occasions to the international community and was well received. Featured in several articles (Environmental Finance, 5 June 2011; Outreach, 27 June 2011, etc.), and presented at the Asian Development Bank's "Urban Forum 2011: Financing Future Cities", November 2011.

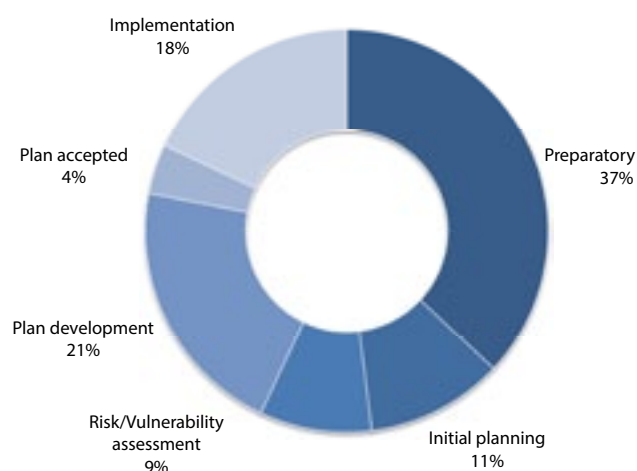
The Global Report was also used as a basis for the cooperation between ICLEI and Global Energy Basel (GEB, the Sustainable Infrastructure Financing Summit) in the field of sustainable urban infrastructure. In fact, following the report's recommendation of a bottom up approach to financing urban infrastructure process, ICLEI helped a selection of cities prepare business plans to have projects financed, which were presented at GEB in January 2012.

Research and analysis

The report "*Progress and Challenges in Urban Climate Adaptation Planning: Results of a Global Survey*" by JoAnn Carmin, Nikhil Nadkarni, and Christopher Rhie of Massachusetts Institute of Technology (MIT), Department of Urban Studies and Planning (MIT Report), was presented at Resilient Cities 2012. With data stemming from a survey of 468 ICLEI members worldwide, it forms a clearer picture of the progress that local governments are making on adaptation planning and implementation. The results of the

MIT Report are discussed and referred to throughout this report.

The Intergovernmental Panel on Climate Change (IPCC) report "*Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*" (SREX) was launched in early 2012. The report concerns the interaction of climatic, environmental, and human factors that can lead to impacts and disasters. SREX mentions the role cities play in mitigation and adaptation, specifically mentioning ICLEI's support of local efforts on climate resilience and climate change adaptation. Meanwhile, the IPCC is making progress towards the Fifth Assessment Report, which will be launched in 2013 and 2014.



Status of adaptation planning in surveyed cities

Source: MIT (2012)

Key forums and sessions

Reality check Workshops – Adaptation on the ground

The Reality Check Workshops at Resilient Cities provide a platform for in depth analysis of specific cases where cities are taking measures towards greater resilience, through climate change adaptation. These cases represent real-world applications of the core themes identified throughout the congress.

This year's Reality Check Workshops demonstrated once again the wide diversity of geographies and challenges represented by cities around the world in their quest for resilience. The sessions travelled from a developed European city grappling with sea level rise and heavy rains (Copenhagen, Denmark, see page 16), to one of the driest cities on Earth where its entire annual rainfall can come in two days (La Paz, Mexico, see page 14), to the spectacular coastline of northern Italy prone to devastating landslides (Ancona, see page 12), to a city located in the dangerous typhoon belt of the Philippines (Sorsogon, see page 18).

Each city has a unique story, yet there are surprisingly similar themes underlying their journeys towards resilience:

- All four cities link adaptation with low carbon mitigation strategies, resulting in a total climate response.

- Building resilience to climate change can also be a first step towards a Green Urban Economy (GUE).
- Understanding tools: Several cities employed quite sophisticated risk analysis tools, but then had to "translate" the results to use in shared learning consultative meetings with people who did not necessarily have those technical skills. Are "translation services" needed to help bridge this gap?
- Known issues: Climate change is a new field, full of uncertainties and surprises. But starting by talking about known local problems (e.g. landslides, cloudbursts) means cities can then broaden the discussion to other climate impacts and how they are affecting everyday life.
- Collaborations: Who participates in the process is as important as How the process is designed and managed. Each city has gone to great lengths to identify the important stakeholder groups, obtain political buy in, and partner with research and funding institutions.

Key forums 2012

In brief, cities must consider:

- An integrated approach involving all sectors and aspects of society is necessary to effectively reduce risk.
- The private sector can help build local capacity.
- Risk based, strong urban governance is vital. Weak governance influences all other risks.
- Rapid urbanization would benefit from an international guideline document for local governments to deal with it and reduce its associated risks.

UNISDR is actively contributing to reducing risk in cities around the world with its “Making Cities Resilient” campaign, implemented with initiatives such as the “Handbook for Local Government Leaders” and the “Local Government Self-Assessment Tool” (LG-SAT) (see Page 19).

“Communicating risks, and the need to deal with them, to both national decision makers and local communities, is a priority for cities”

Violeta Somera-Seva, Senior Advisor, City of Makati, Philippines

Resilient Cities 2012 featured two forums hosted by partners to specifically address key themes: Urban Risk and Resilient Urban Logistics.

Urban Risk Forum

Cities face a number of risks that are a function of their exposure, vulnerability, and adaptive capacity. According to the World Economic Forum’s Global Agenda Council on Urbanization 2011, cities are the hubs of the global economy, so cities at risk could also mean global economy at risk. The fact that the process of urbanization gives rise to incremental risks is often not recognized. Further, failed cities are a less understood facet of the failed state phenomenon, but represent one of the biggest threats to global civil society.

Both intertwined aspects, cities at risk and cities as risk, were covered at this year’s Urban Risk Forum. As highlighted by Global Risk Forum (GRF) Davos, these risks have to be dealt with according to the probability the event will occur and the potential impact of it. The cost-benefit analysis leads to an optimal prioritization of spending resources, where the cost of the measures to be taken does not outweigh the cost or impact of potential damage. Measures have to be implemented simultaneously in political-institutional, social, environmental, and economic aspects of the city. Integrative disaster risk management is also a continuous cyclic process, concentrating equally on: prevention/preparedness; response/intervention; and recovery/reconstruction.

The Forum identified informal settlements in rapidly urbanizing cities as one of the major areas of risk and one of the major challenges to risk reduction. These are putting stress on the provision of basic services and infrastructure, which in turn causes and exacerbates a range of hazards, such as wildfires, flooding, earthquake risk, health hazards, etc. Risk reduction strategies should therefore be implemented for, and with, communities in informal settlements. Another challenge to risk reduction is that the benefits of prevention are not tangible because they are the disasters that did not happen. Making risk reduction a priority thus requires significant political will.

Cities around the world are taking action to reduce risk. Makati City in the Philippines is increasing its resilience by strengthening institutional capacity and mainstreaming disaster risk reduction and climate adaptation into land use planning and development programs for all sectors. At the same time it is working with communities to collect vulnerability information and involve them in solutions.



Walter Ammann, President, Global Risk Forum GRF Davos



Destruction in Port-au-Prince, Haiti, after the magnitude 7.0 earthquake in January 2010.

Resilient Urban Logistics Forum

Although cities are key places of flows of goods and services, in both developed and developing cities there generally is a lack of inclusion of logistics in city planning. This is in part due to a lack of awareness by local governments and also a lack of understanding of logistics by members of the public, which if altered, could lead to changes in approaches for logistics. Despite this, logistics is an important part of cities' systems tackling resilience and adaptation issues, especially in disaster risk management and emergency responses.

This year's Resilient Urban Logistics Forum, hosted by Deutsche Post DHL, opened up the floor and started real dialogue on the connections between urban resilience and logistics. There is a clear potential for logistics to be incorporated in adaptation planning from the outset, in addition to both the presence of logistics in the response phase that comes after a disaster has struck (e.g. Deutsche Post DHL's GoHelp program), and for sustainable logistic approaches through using intelligent transportation systems and technologies, eco-mobility in deliveries, and low emission vehicles.

These were illustrated in the Forum by case studies from Istanbul (Turkey), Almada (Portugal), and Ningbo (China) and presentations by Siemens and SAP. But when it comes to addressing climate change, these mitigative measures also need to be considered in conjunction with adaptation planning.

Often, logistics operators are well aware of the risks to the supply chain and already incorporate resilience into that design – a great source of knowledge for cities. Other logistics and city operation cross-overs that already occur, and could create win-win situations for cities, include the consideration of adaptation in transport and eco-mobility planning and in DRR.

The emphasis for cities is to therefore consider logistics in adaptation planning from the outset. It is clear from the Forum that this presents new challenges for cities. The City of Almada, Portugal, highlighted the challenges it faced incorporating logistics into its Urban Mobility Plan once it had been adopted. These included discussing with retailers, changing behaviors (e.g. delivery habits and times), and later, in the implementation stage, pedestrian only areas (e.g. locating consolidation centers for items) and managing one off events such as market days. Given a lack of leading base line examples in how to incorporate logistics into adaptation, many cities addressing this now will be paving the way for others to follow suit.

In brief, adopting logistics in adaptation planning requires:

- Further analysis of the impact of climate change on transport systems and networks;
- Analysis of the exposure of supply chains to climate risks; and
- Potentially re-designing aspects of supply chains so they are inherently more resilient to future shocks (e.g. distributed logistics of a more modular design, creating parallel and sustainable paths for alternative transportation, localizing hubs and suppliers within the city, and gaining supplies from shorter or local distance).

“Local governments face the challenge of balancing consumers' increasing appetite for goods and services within cities, with increasing scarcity of supply and the need to respond and react to unforeseen shocks to the system. Good logistics principles become part of the system that balances these demands”

Martin Brown, Program Director, City Logistics, Deutsche Post DHL



Transportation of goods by boat on the Mekong river, Vietnam



Martin Brown, Program Director, City Logistics, Deutsche Post DHL

2012 Kick-off sessions

Resilient Cities features Kick-off sessions to introduce future forums. As a precursor for 2013, this year these were held on Urban Agriculture and Resilient Buildings and Construction.

Urban agriculture session

There were two key messages in this year's lively urban agriculture (UA) panel: There is a need for UA to contribute to a city's resilience, and within that, for a new level of innovation and diversity. As START International Inc. outlined, UA contributes to resilience through food and nutritional security, enhancing livelihoods and urban economies, the provision of environmental services, whilst being a direct community response to climate change. While the importance of a strong urban food system was highlighted as existing and necessary in certain cities, in some cases nearly 35%, there is certainly room for advancement. Case studies from cities in Morocco, Bangladesh, and Nigeria, contrasted with large scale agricultural based infrastructure projects proposed by Plantagon in Sweden and research into third millennium insect farming research in Canada, focusing on crickets.

The message is clear that each city has its own unique food challenges to incorporate into adaptation and this must occur at a city level, without fear of trying new solutions to resilient food provisions. Creativity and innovation, along with incorporation into building and construction design, will be needed as illustrated by Plantagon's proposals. These contrasting examples pave the way for the Urban Agriculture Forum at Resilient Cities 2013.

Resilient buildings and construction session

Buildings are one of the most important parts of a city's infrastructure, so making buildings resilient is essential to making cities resilient. Buildings are under pressure from all kinds of hazards: weather events, earthquakes, flooding, power outages, etc. Many of these pressures increase with climate change. It is apparent from the resilient building and construction session at this year's congress that resilience and adaptation add a new and missing dimension to green building practices. Buildings are often designed with historic conditions in mind, but must now be prepared for future conditions. The building design not only ties in with energy demand, water usage, storm water and runoff management, but also with how a building behaves under extreme conditions such as storms and earthquakes.

Actions to address the challenges will be explored further at Resilient Cities 2013, and include:

- Lobbying: to establish legally required national regulations (like the US Green Building Council is doing in the United States), or implement local regulations.
- Streamlining: creating more continuity in building regulations and certifications - numerous standards lead to conflicts and confusion. Linking resilient and adaptive building strategies to rating systems such as LEED would promote implementation.
- Forward thinking: encouraging resilient building practices with clients - an area where insurance companies and local governments can play a key role.

In brief, key points for cities on urban agriculture are:

- The role of UA in green infrastructure planning is increasing (e.g. Casablanca, Morocco)
- The importance of including UA in policy and action was illustrated (Dhaka, Bangladesh)
- The core challenges UA faces (as identified by START) are: alterations in land base, rising costs of inputs and fuel, climate risks, and pollution and health risks.

"We are ready to build a sustainable food system. We get up to 10 times more growable area than the ground area used. We do not consume any more water than what is used by the plants. And we integrate the greenhouse into the city infrastructure"

Magnus Hjelmare, Global Brand Director, Plantagon International AB

"Green building practices can be brought into practice by modest building code improvements."

Jason Hartke, Vice President of National Policy, US Green Building Council

Review of congress themes

Collaboration

A recurring theme distilled from all sessions at this year's conference is the need for collaboration - between stakeholders, within communities, across local government units, and also internationally - to effectively steer cities along a resilient path. Partnership between stakeholders has great potential, given that only 11% of cities worldwide report forming partnerships with business on adaptation, while generating interest amongst businesses is listed as a challenge to adaptation planning (MIT, 2012).

Despite this, this year's conference has begun to see promising examples of collaborations from around the world. Community-based, bottom-up initiatives work and are important for resilience in a city. Key challenges are: how to communicate climate change impacts not only to decision makers but also to the community; resource constraints such as funding and timing; the need to bridge the disconnection between research and practice; and the need to better include business in community solutions.

At Resilient Cities 2012, in addition to providing the space for participants to collaborate and start to overcome these challenges, an interactive platform for young researchers was run to bridge the gap between research and practice at an early stage of researchers' careers (see page 19). In the sessions throughout the congress, examples of stakeholder inclusion in adaptation outlined were: Using and creating an online toolbox for local governments to work with their community (the CIDA project in Denmark), including children in all processes, particularly risk mapping (UNICEF), including the local community in the process for retrofitting their housing (ICLEI Africa), and the value of local perceptions in assessing climate adaptation (ICLEI South Asia).

Combined research projects consisting of living labs (Sustainable Construction Living Lab, Portugal), research hubs (with students at the Technical University (TU) Berlin) and cross-border collaborations (Urban Transitions between Sweden and Denmark) were shared, illustrating how businesses, local governments, academics and researchers are collaborating on adaptation projects.

Risk assessments

Rapid urban growth and climate change effects are converging in dangerous ways. To be able to take appropriate action, cities need to conduct solid risk assessments. Nearly 40% of the surveyed cities have conducted, or are conducting, a risk assessment (MIT, 2012). A comprehensive risk assessment includes the expertise of all municipal departments, scientific data, and the knowledge of local stakeholders in the community, so that the vulnerabilities of particular social groups and infrastructures are taken into account.

A key consensus among the experts at Resilient Cities 2012 was that not only local climatic stressors need to be taken into account, but also systemic risks. This includes events that have cascading and destabilizing effects such as financial crises, world peak oil production, food and water shortages, etc. There are complex interactions among city sectors, systems, and land use that need to be considered. Cities must therefore be assessed from a systems perspective.

Many cities are undertaking promising work in conducting risk assessments such

“Effective disaster risk reduction and adaptation is offering development opportunities in the short-term and reducing vulnerabilities long-term”.

David Dodman, Senior Researcher, International Institute for Environment and Development

Challenges for risk assessments include:

- Inconsistent hazard data and the limited capacity of climate models;
- Ample risk information is available, yet its use is still limited;
- The ability and willingness of major stakeholders to address climate change is critical;
- Trying to analyze and manage systemic risks and their impact is challenging, so synergies between solutions have to be created.

Reality Check: Ancona, Italy

The City of Ancona is located on the north-west coast of Italy, has a population of 100 000 permanent residents, increasing due to tourism during the summer. It is an important Adriatic port with fishing, passenger, and freight traffic. The jagged coastline is very scenic but also creates natural barriers. Ancona has very vulnerable transport links, relying on two access roads along the coast and a north-south railway link.

Ancona has a history of landslides after heavy rain and still remembers the night of 12 December 1982 when the "hill Montagnalo started to slide towards the sea". Nearly 4000 people were evacuated, over 500 jobs were affected, but no lives were lost. After intensive geotechnical studies, the community concluded that they could not "solve" the landslide problem, but rather had to "learn to live with it" – not removing the risk but adapting and improving their risk management.



The port of Ancona



Marco Cardinaletti, Project Manager for Sustainable Development, Municipality of Ancona, Italy

Adaptation planning

- 2000: Joined Local Agenda 21
- 2006: Adopted Ancona Sustainability Plan
- 2011: Adopted Integrated Adaptation Plan
- 2011: Signed UNISDR My City is Getting Ready Campaign for disaster preparedness

Adaptation planning was supported by the *European Union ActLife program* and partnered by the Institute for Environ Protection and Research (Italy). Part of this process was to conduct a risk assessment with a 40 year time horizon to 2050. The major risks/challenges identified were:

- Infrastructure and road links
- Intensive coastal erosion two thirds of the year
- Tourism, restaurants, and cultural heritage, specifically in the historic town center
- Flooding and landslides

Integrated and participatory

Ancona established a strong governance structure: three Local Adaptation Boards, maximum 10 people each, and several focus teams to work on specific climate risks. It also conducted a thorough "impacts-influence matrix" to identify the key groups affected by each climate impact. This helped to find the groups or actors who could partner with the city to take action.

Like Copenhagen (see page 16), Ancona used a quantitative methodology for assessing the vulnerability and risk of the three coastal zones, and then used this information as input for shared learning meetings with other stakeholders.

as the city of Cape Town, South Africa. They have employed a risk assessment with, on the one hand, a city-wide assessment based on expert opinion, historical records and hazard science, and on the other hand, a community-based assessment.

Urban climate adaptation planning and policy

Most cities are in the nascent stage of adaptation planning, so many actions are formative, such as meetings or online research. To be effective, adaptation policies and plans must be mainstreamed across all sectors of urban development; crucially this must occur in urban development and land-use planning. More and more tools are becoming available to assist local governments with adaptation policy making. Lessons can be taken from disaster risk management approaches, as highlighted in the urban risk forum (see Page 8). Despite this, resilience and adaptation are not yet taken seriously enough in key urban expansion decisions. Further, issues such as urban poverty reduction must be put on the agenda, which requires a systems understanding of the city beyond just spatial analysis.

Once complete, the aforementioned risk assessments should be translated into risk maps, which inform the creation of new land-use plans and the revision of existing ones. These can guide urban development in a more resilient direction, offering a proactive approach instead of a reactive one. Cities are taking action on this such as the city of Almada, Portugal, which has integrated climate adaptation goals on all scales, from territorial planning to detailed urban design.

Where uncertainties over local climate impacts are a cited reason for a lack of action, cities can apply no-regrets policies that work within the existing system. These can then be scaled-up when necessary. Such a future-proof approach prevents maladaptation and ensures appropriate action can be taken when certain changes in the conditions are reached.

Importantly, climate change mitigation and adaptation should not be treated as two separate goals. Planning priority should be given to measures that contribute to both, such as improvement of wastewater treatment systems, green spaces, building standards, and public facilities. An example is integrated water management which is an essential part of planning for adaptation, as was illustrated by the examples of cities around the world at this year's congress. Another example is considering resilient urban logistics in adaptation planning, as discussed at this year's Resilient Urban Logistics Forum (see Page 9).

Thinking ahead:

Guiding urban development towards resilience is always better, and cheaper, than only engineering infrastructure to withstand possible hazards. Cities must be pro-active instead of re-active.

“You cannot achieve resilience through single interventions, you need a systems approach.”

Jo Da Silva, Director, Arup International Development



Informal settlements in Zanzibar Town, Zanzibar



Jo Da Silva, Director, Arup International Development

Reality Check: La Paz, Mexico

La Paz is located on the western coast of the Baja California Peninsula of Mexico. Capital of the state of Baja California Sur, with a population of 250 000, La Paz calls itself “the aquarium of the world” on account of its incredibly rich marine life. La Paz’s very low rainfall tends to come in short intense bursts, causing severe coastal flooding threatening a number of low income settlements, and creating difficulties in retaining water for future use. It is an area of extreme desertification creating threats to biodiversity and placing stress on residents and livelihoods.

Social and cultural challenges

These pressures are exacerbated by unsustainable lifestyle practices – wasteful water usage, a high rate of vehicle

ownership, unsustainable cropping and fishing practices and general reluctance to change behaviors. The city has also identified spatial planning as a high priority. At present, the most vulnerable areas such as lagoons and waterways are not under planning control. This means that schools and hospitals could be built on available space near waterways, and condos could be built by the lagoon unless urgent action is taken to review and expand coverage of the urban development plan. This will need very strong political commitment and leadership particularly when making and enforcing unpopular zoning decisions. Fortunately, there are now newly elected councilors who are prepared to take up the challenge. There is an attitude that the city is small enough to be able to change things.



Antonina Ivanova, Program Coordinator, Professor and Researcher, Universidad Autónoma de Baja California Sur, Mexico



Aerial view of La Paz

The way forward

La Paz has worked with the Inter-American Development Bank (IDB) to develop an integrated mitigation and adaptation plan. This is part of the IDB’s Emerging Sustainable Cities Initiative and involved undertaking a rapid climate assessment, which established resilience indicators as a way of kick-starting private sector interest and investment. Several research and technical partners were invited to join the team to bring expertise in coral reefs, fishery resources, low energy technologies etc.

The high priority areas in their integrated plan are:

- Improved water management, especially groundwater conservation
- Coastal planning and flood management
- Desertification and biodiversity

- Energy efficiency
- Sustainable private and public transport
- Urban planning

La Paz has enrolled the participation of civil society, business, the research community, and national and state governments. Now it also needs to engage the local community in proposed measures, particularly for behavior change programs. The IDB has stated that it can assist by bringing investment funds now that the city has collected data, analyzed risks and responses, and designed projects. Because of the new impetus brought on by a new generation of politicians, supported by good information and research institutions, a dynamic private sector will view La Paz as a good investment prospect.

Implementation

The commitment of local officials is essential to advance adaptation to the implementation phase. Approximately 18% of ICLEI members are currently implementing their adaptation plans, with European and African cities reporting the highest level of implementation (MIT, 2012). This is set to increase as cities progress further with adaptation plans. One aspect of implementation explored at Resilient Cities 2012 is ensuring the presence of a city's green infrastructure (land) and the associated enhancement of local ecosystems (parks, gardens, woodlands and wetlands). Resilient communities need resilient ecosystems and landscapes.

The broader discussion on built infrastructure suggests there are also challenges in the implementation of requisite structures. For some cities, these challenges are apparent following a natural disaster, where there are opportunities to build better infrastructure from the ground up (e.g. Japan's recent earthquakes and catastrophic tsunamis). It is of course better to plan and implement resilient infrastructure from the outset, as the City of Barcelona, Spain, is doing. The Barcelona Infrastructure Urban Resilience Board (TISU) is coordinating infrastructural investment and implementation between local government departments and private operators.

Implementation of low carbon, no regrets projects such as low carbon neighborhoods and cities can have an integrated approach. The Brøset neighborhood in Trondheim, Norway for example used an approach of integrated adaptive solutions, with functionality, health, and well-being taken into account in design, along with adaptation and mitigation. Coordinating with local stakeholders right through into the implementation phase is also imperative. For example, maintenance and construction of community-level drainage projects can be jointly completed between communities, civil society and municipalities (e.g. Asian Cities Climate Change Resilience Network project in Gorakhpur, India).

Financing resilience

The highest rated challenge for local governments in planning for adaptation is resource related, with 85% of surveyed cities facing challenges in securing funding for adaptation work (MIT, 2012). Several sessions at Resilient Cities 2012 explored how cities can fund their adaptation and resilience goals. Where international funds are available, they are often designed to work with national governments, so there is work to be done to align funding agendas to local needs. Local governments can also apply local economic instruments such as charges and taxes for emitters and polluters (carbon, waste water, solid waste, property taxes for vulnerable locations) and subsidies and tax incentives for developments contributing to resilience.

Private investment, fostered through developments that increase resilience, will be crucial to fund all necessary investment in adaptation. Public Private Partnerships (PPP) should be used from the inception stages of a project, to ensure it is feasible and profitable (see inset). Resilience, in turn, increases the attractiveness and competitiveness of cities for investment by businesses through: lower costs for public services (transportation, energy), lower risk of disruption to business, lower long-term insurance costs, job creation in a range of low-to-high skilled occupations, etc. Similar advantages have come to be known with Green Urban Economy (GUE): actions that simultaneously address environmental and economic concerns within the city through new green growth. Examples of leading GUE strategies are: energy efficient buildings, renewable energy, efficient distribution of clean water and waste, sustainable transport, etc. While these are

“After a natural disaster, there are significant opportunities to build back better infrastructure from the ground up, but it is difficult to plan and implement this during the response phase.”

Malka Older, Specialist, Disaster Risk Reduction and Emergency Preparedness, Save the Children

In brief, to attract investment cities should:

- Prepare feasible project proposals;
- Improve their credit worthiness and give financial guarantees to investors in case of risk;
- Leverage existing assets and financial resources through public-private partnerships;
- Establish enabling policies for facilitating investment;
- Build human and institutional capacity;
- Promote green business conduct and consumer engagement through awareness programs; and
- Start with small projects immediately, to create visibility.

Reality Check: Copenhagen, Denmark

Copenhagen, the capital of Denmark, has a population of 540 000 but the population of the entire urban area is closer to 1 500 000 people. The city is very vulnerable to sea level rise and to severe rainfall events and suffers from the urban heat island effect during warm summers.

Like many developed cities, Copenhagen struggles to manage issues related to its population density and loss of the natural environment. While current legislation is somewhat inadequate in addressing this, at the same time there is a lot of political commitment to address these issues, which has led to important action.



The Copenhagen Cloudburst Plan must prevent future damage from severe rainfall events.

Climate Change Plan

The city adopted a climate change plan in 2011. In July 2011 a severe “cloudburst” resulted in damages totaling over € 67 million. This was just one of three severe rainfall events in 12 months - the results of which galvanized the city to prepare a Cloudburst Plan as a key component due to this specific vulnerability. The vision is to make the city resilient in response to rainfall within 20 years and includes a suite of hard and soft measures, tailored to each of its 12 catchments.



Lykke Leonardsen of the city of Copenhagen explains its adaptation plans.

IPCC scenarios were used to project future climate impacts, of which the city adopted the more extreme scenario to allow for the high uncertainty in climate projections. A very scientific risk assessment methodology, followed by cost-benefit analysis, was used to quantify and prioritize climate risks. Although estimated costs and probability showed that severe rainfall events are the most immediate risk, in 30 years' time it is expected that sea level rise will pose a greater risk.

Green growth

Copenhagen asked the question: “Can adaptation be turned into Green Growth, innovation and employment?”, and concluded YES because:

- An adaption strategy can function as a driver for green Growth;
- A climate proof city is more attractive to invest in;

- A resilient community secures existing investments and attracts new investments; and
- Adaptive capacity is a competitive advantage - cities capable of protecting business and citizens from climate related threats are more attractive places to live, work, and invest.

To make this happen, Copenhagen is working through partnerships, including:

- Copenhagen Clean Tech cluster
- Danish Water Forum
- Danish Industry
- Ministry of Business
- Public Private Partnerships

primarily climate change mitigative measures, they also bring advantages for adaptation planning and enhancing resilience. These policies should therefore be seen as “win-win” for cities.

Governance

Few cities report national government understanding of local issues on adaptation. At Resilient Cities 2012, this challenge was addressed through illustrating interactions between multiple levels of governance. Synchronous local and national governance adaptation included guidelines and training for local level planning (happening in the Philippines and South Korea), province-level advisory panels to monitor progress (South Korea), fiscal incentives linked to performance indicators for improved environmental management (South Africa) and the national government funded program Adaptation Scotland (Glasgow and Clyde Valley, Scotland). Local governance is also leading in the absence of national action or national supporting frameworks (Canada).

At a regional governance level, an active participation workshop was run on anchoring the urban dimension in the European climate adaptation strategy. Key outcomes from that workshop were passed on to the European Commission DG CLIMA as an input to developing the European adaptation strategy to be launched in March 2013.

The discussion on multi-level governance has progressed to identifying challenges and opportunities in the different steps towards increasing resilience:

- **A national framework** for adaptation policy making is often too rigid on the local level: one size does not fit all. The national level should provide a framework to fund local adaptive needs.
- **Capacity building** for local government practitioners is essential, especially for smaller communities that lack technical knowledge.
- **Enforcing** adaptation plans can be a difficulty for local governments, such as no-build zones in floodplains, especially in rapidly urbanizing areas.
- **Political change** can hamper progress in local governments, bringing about staff change, and losing knowledge and capacity. Political will is essential.
- **Dispersed governance** at the local level makes it difficult to make decisions with a global vision. Horizontal integration of efforts are necessary.

“We will act now even before legislation passes - because citizens deserve it!”

Lykke Leonardsen, Head of Department, City of Copenhagen, Denmark

“Resilience is a great market opportunity, as cities are the customers of innovative solutions from the private sector.”

Ayfer Baykal, Environment Mayor, City of Copenhagen, Denmark



The city of Barcelona is working on resilient infrastructure through its Infrastructure Urban Resilience Board (TISU)



Ayfer Baykal, Environment Mayor, City of Copenhagen, signing the UNISDR “My City is Getting Ready” commitment.

Reality Check: Sorsogon, Philippines

Sorsogon City lies at the southernmost tip of Luzon, the Philippines, with a population of 150 000. Of its 64 barangays, the lowest level of government in the Philippines, 37 lie along the coast. Sorsogon Province is considered to be at very high risk from a combination of climatic hazards and volcanic eruptions. The city is particularly exposed to tropical cyclones and storm surges, extreme rainfall/flooding, temperature variability, and sea level rise. It averages 19 typhoons every year and experienced two super typhoons in 2006. The adverse climate is also expected to impact the income of more than 50 beach resorts as well as small traders and micro-entrepreneurs in the tourism industry. The combination of a city lacking proper DRR equipment, tools and facilities, and a general public that has limited knowledge of climate change related hazards and risks, leaves the poor – making up 43% of the city's population – particularly vulnerable.

Preparing for climate change

Supported by the UN-Habitat Cities Climate Change Initiative program, the city established a core team and technical working group for climate change. An intensive participatory assessment of the city's vulnerability to climate change has been completed and will be used to update the existing City Land Use Plan, as well as feeding into policy discussions at all levels. The city conducted multi-sector consultations which defined critical actions to increase people's resilience to climate change impacts. Special attention is being given to informal settlements in vulnerable areas, relocating them when necessary. Additionally, the city's Disaster Coordinating Council is now being sensitized with climate change preparedness issues as an entry point to mainstreaming climate risk reduction into city governance processes.



Maria Adelaida Mias-Mamonong, Project Coordinator, UN-Habitat Philippines



The coastline of Sorsogon

Micro and Macro level responses

The Sorsogon project has produced some very practical, localized initiatives while also working at the macro-level. The city has formulated guidelines and minimum standards for resilient housing and site planning, and assists people at retrofitting their houses. UN-Habitat has worked with the city government and department of education to develop a SMART School design (Schools Mitigating and Adapting to Risks and Threats) so that schools can also serve as evacuation centers.

At the macro-level, Sorsogon is being used as a pilot city to demonstrate to other cities in the Philippines how to incorporate climate change sensitivity into their Comprehensive Land Use Plans and Development Plans.

The project, led by UN-Habitat, made climate science understandable to local government staff. This increases their ownership of the assessment and the likelihood that something will happen with the outcomes.

Challenges:

- Local stakeholders find vulnerability assessment useful, but often too complex to understand.
- Cities must therefore reduce complexity or complement with capacity building efforts.
- Difficult to overcome the gap between assessment and implementation.
- Difficult to replicate lessons learned in best practice cases and upscale them to the national level.

Side events and launches at Resilient Cities 2012

IRENA pre-event

International Renewable Energy Agency (IRENA) ran a pre-event workshop entitled “Renewables for Resilient Cities: A Roadmap from 2012 to 2050” with experts convening in an action café and considering the role of renewables in cities.



Interactive platform for young researchers

The United Nations University Institute for Environment and Human Security hosted an interactive platform for young researchers to communicate and present knowledge gained during their research and to share and discuss their experiences with others in the framework of the Resilient Cities congress. This was attended by 25 participants from around the world.

Highlights of the platform were the implementation of a Scientific Market Place and Learning Café as innovative tools to encourage knowledge exchange. The Scientific Market Place reinforced the conviction that cooperation between different sectors, such as academic, economic, government, amongst others, is crucial in order to resolve problems, especially those related to climate change. The Learning Café aimed at giving the young researchers the unique opportunity to interact with senior experts focusing on climate change adaptation and mitigation. The knowledge exchange resulted in a deeper understanding of: (1) developing a city resilience strategy; (2) building adaptive capacity of officials in the city; (3) developing funding application strategies, including indicators and specific concepts defining key characteristics of energy efficient resilient communities; and (4) finding the most efficient ways to communicate research to decision makers.

UNISDR handbook for local governments launch

UNISDR launched “*How to make cities more resilient: a handbook for local government leaders*”. It provides mayors, councilors and other local government leaders with a framework for risk reduction and points to good practices and tools that are already being applied in different cities.

This handbook will complement the UNISDR “Local Government Self-Assessment Tool” (LG-SAT), an online tool that helps local governments to engage different stakeholders to map and understand gaps and challenges in disaster risk reduction in their city. It allows them to measure and report their progress against the Ten Essentials for Making Cities Resilient that they committed to in the Making Cities Resilient Campaign. ICLEI and UNISDR carried out a four-month joint project at the end of 2011 to test the tool in 23 selected cities in 16 countries.

EEA report launch

The European Environment Agency (“EEA”) launched its report “*Urban adaptation to climate change in Europe - Challenges and opportunities for cities together with supportive national and European policies*” (EEA Report No.2/2012). The report informs about key challenges that climate change poses to European cities and highlights the need for the effective participation of local governments in adaptation.

ICLEI Canada adaptation tool launch

ICLEI Canada launched its new Online Municipal Adaptation Planning Tool. The tool allows municipalities to work through a five-milestone municipal adaptation planning process based on ICLEI Canada’s proven municipal adaptation methodology first outlined in *Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Action*. It is currently put into practice by Canadian municipalities through ICLEI Canada’s Adaptation Initiative.

UCCRN networking session

Urban Climate Change Research Network held a networking session during the conference, bringing together multiple practitioners.



Launch of the EEA report “Urban adaptation to climate change in Europe”

Outlook for 2013

Integrated strategies, special focuses

Interconnection among sectors calls for integrated solutions, so it is important to address a wide scope of topics. At the same time it is valuable to explore certain emerging themes more in depth, in particular looking at the link these themes have in relation to urban resilience.

Resilient cities will therefore continue to feature key aspects of resilience through specific thematic forums. Building on the topics of this year's event, focus in 2013 will be, among other things, on urban agriculture (in collaboration with Plantagon), resilient building and construction (in collaboration with WGBC), renewable energy, and spatial data for resilience. Resilient Cities is continually looking for expert partners to deepen the discussion on such topics.

"Children make up half the population of cities. They are half the people affected, but they are also half the people that can do something about it."

Anthony Spalton, UNICEF

The Congress creates unique opportunities for researchers and urban professionals from around the world to learn from each other. Each year I gain new ideas and insights that shape the questions I address in my research.

JoAnn Carmin, Associate Professor of Environmental Policy and Planning, MIT, Boston, USA

The social aspects of urban resilience

Urban resilience contributes to, and is essential for, a sustainable urban development. The social aspects of urban resilience have been partially highlighted in the previous editions of the conference but certain aspects such as the link to poverty and poverty alleviation need to be further explored. This requires a thorough socio-economic understanding of the functioning of the city. Especially in rapidly urbanizing cities, informal settlements require extra attention due to the pressure they put on infrastructure services and the hazards they pose and are exposed to. We need to work with these most vulnerable communities in assessing risk, planning, and implementing solutions. Children, who are one of the most vulnerable population groups, should be included in these efforts.

"Best things about Resilient Cities? Fresh perspectives, new ideas and time to chat with adaptation colleagues from around the world"

Adaptation Scotland

"Hearing about the critical role of logistics – as common logistics as well as looking at logistics from the socio-technological perspective – has been highly valuable to me."

Peter Andreas Heiberg, Project Manager, City of Copenhagen, Denmark



References and further reading

- ICLEI (2007): *Resilient Communities and Cities Initiative*.
- ICLEI (2011): Briefing Sheet, *Towards urban resilience*.
- ICLEI (2011): *Financing the Resilient City: A demand driven approach to development, disaster risk reduction and climate adaptation*, ICLEI Global Report.
- ICLEI (2011), *Resilient Cities 2011: Congress Report*.
- European Environment Agency (2012): *Urban adaptation to climate change in Europe*, Challenges and opportunities for cities together with supportive national and European policies. EEA, Copenhagen, 2012.
- UNISDR (2012): *How To Make Cities More Resilient. A Handbook For Local Government Leaders*. UNISDR, Geneva, Switzerland.
- Swiss RE (2012): *Sigma. Natural catastrophes and man-made disasters in 2011*: historic losses surface from record earthquakes and floods. Swiss Reinsurance Company Ltd., Zurich, Switzerland.
- JoAnn Carmin, Nikhil Nadkarni, and Christopher Rhie (2012): *Progress and Challenges in Urban Climate Adaptation Planning*: Results of a Global Survey. Massachusetts Institute of Technology (MIT), Cambridge, MA
- *Durban Adaptation Charter for Local Governments* as adopted on the 4th December 2011 of the occasion of the "Durban Local Government Convention: adapting to a changing climate" - towards COP17/CMP7 and beyond.
- Alan McKinnon and Andre Kreie (2010): *Adaptive logistics: Preparing logistical systems for climate change*. Paper presented at the Logistics Research Network Conference in Harrogate, 8-10 Sept 2010. Logistics Research Centre, Heriot-Watt University, Edinburgh, UK
- Presentations and session descriptions for each of the topics covered, along with additional reports, interviews, blogs, links to the previous congresses, and updates for next year are located on the Resilient Cities homepage. Please see: <http://resilient-cities.iclei.org/bonn2012/>

Congress team

Resilient Cities 2012 was made possible by the Resilient Cities 2012 Congress team:

Management



Alice Balbo
Congress & Project
Officer

Program and speakers

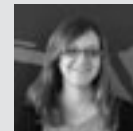


Maarten De Cock
Congress & Project
Assistant



Emily Dowding-Smith
Congress & Project
Assistant

Logistics and participants



Karline Klamp
Congress Assistant



Ugne Vaitiekunaite
Research & Reporting
assistant



Resilient Cities 2013

The Resilient Cities 2013 congress, the global forum on urban resilience and adaptation to climate change, will once again be organized in Bonn, Germany from **31 May - 2 June 2013!**

Resilient Cities Congress Secretariat

ICLEI – Local Governments for Sustainability
World Secretariat
Kaiser-Friedrich-Str. 7, 53113 Bonn, Germany
Tel: +49-(0)228 / 976 299-28
Fax: +49-(0)228 / 976 299-01
www.iclei.org/resilient-cities

Key solution partners



The Sustainable Infrastructure
Financing Forum



Supporting partner



Media partners



Resilient Cities 2012

Endorsing partners

