



# Avoiding Extreme Weather Losses: A Call for a Global Climate Adaptation Practice



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*“Cities are not waiting for national governments to act on climate change. Whether or not one storm is related to climate change or is not, we have to manage for risks, and we have to be able to better defend ourselves against extreme weather and natural disasters. We don’t know whether the next emergency will be a storm, a drought, a tornado or a blizzard, but we do know that we have to be better prepared for all of them.*

– Michael Bloomberg, Mayor, New York NY USA

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## Climate Risks and Responsibilities Lie with Cities

500 cities around the world with one million or more inhabitants are becoming home for a growing majority of the world's population.<sup>1</sup> Extreme weather presents those cities and their residents with existence-threatening risks and daunting responsibilities. To confront the risks, each city must align its diverse constituencies in adapting to climate change. To address the responsibilities, the cities must collectively coordinate actions and share experiences. Cities have already discovered that preparing for extreme weather caused by climate change is an undertaking of historic scale and complexity.<sup>2</sup> For many cities, effectiveness of climate adaptation can mean the difference between thriving existence and urban catastrophe.

The confluence of climate adaptation ability and accountability in cities is acknowledged by the increasing frequency with which cities are making climate adaptation a top priority.<sup>3</sup> Tight integration and intimate knowledge of a city's own resources and vulnerabilities yield the greatest ability to prevent loss and respond to effects of extreme weather. Accountability for the well-being of residents and protection of physical assets also rests locally, with the city. In the

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<sup>1</sup> Economist Magazine, "The World Goes to Town" <http://www.economist.com/node/9070726>

<sup>2</sup> "The worldwide cost of adaptation – including better flood defenses, improving transport infrastructure and better resilience to drought – would probably reach sums in the region of \$140bn to \$210bn a year by 2030", Financial Times, Estimated Cost of Climate Adaptation Soars <http://www.ft.com/cms/s/0/6e89855e-9324-11de-b146-00144feabdc0.html#axzz2HPrwKXY2>

<sup>3</sup> World Bank, "Guide to Climate Change Adaptation in Cities", <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1318995974398/GuideClimChangeAdaptCities.pdf>

face of extreme weather, city governments are not only “on the front lines”, but they are also “the final backstop” for security, health, and welfare.

## Aligning Locally and Coordinating Globally

Yes, individual cities are the centers of ability and accountability in adapting to climate change, but city departments shouldn't act alone. Adaptation efforts employ wide-ranging disciplines spanning climate science, architecture, construction, economics, and actuarial science, to name a few. City departments contribute valuable expertise in these disciplines, but local resources outside of city government offer complementary depth and perspective. Insurers, real estate owners, and residents, among others, are stakeholders that have vested interests in protecting a city.<sup>4</sup> Beyond expertise and perspective, buy-in from these other stakeholders strengthens resiliency programs. Coordinating participation of city government with other stakeholders in a context of unknowns and change is a formidable challenge, and every city can benefit from improved alignment of stakeholders.



Climate adaptation experience from cities around the world is a unique and highly-valuable resource. The damage caused by extreme weather and the understanding of what adaptations are most effective in one city can provide guidance to other cities. Cities evaluate techniques, policies, and programs, and improve them based on experience. Leveraging that experience is essential for protecting all cities. While there are already experience-leveraging programs in place, a formal global practice will yield still greater benefits.

Discoveries made by one city hold the potential for other cities to avoid mistakes and achieve better results. Many cities already learn from the experiences of others through membership in ECLEI Local Governments for Sustainability, World Mayors Council on Climate Change, C40 Cities Climate Leadership Group, United Cities Local Governments, Cities Alliance, and other inter-city organizations. They benefit from each others' experience via programs such as a Carbon Disclosure Project's Cities Program which shares information about risk assessments and adaptation in addition to many other topics.<sup>5</sup> Much time is spent on these organizations and programs, but the benefits are constrained by inconsistencies in management practices. For example, although risk assessments and other adaptation practices are common, standards for

<sup>4</sup> World Bank, “Guide to Climate Change Adaptation in Cities”, <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1318995974398/GuideClimChangeAdaptCities.pdf>

<sup>5</sup>“CDP Cities 2012: Seven Climate Change Lessons from the Cities of Europe” <https://www.cdproject.net/CDPResults/CDP-Cities-2012-European-Report.pdf>

evaluating risks are lacking, and vary significantly from city to city.<sup>6</sup> The lack of standards makes it impossible to aggregate and compare experiences. Increased consistency in adaptation management practices across cities is critical for improving learning and results.

Systematic management of adaptation practices and practice knowledge will accelerate climate adaptation for cities. Cities' ability to adapt to climate change has benefited from past communication among cities, but the process of capturing, sharing, and leveraging is still at an early stage of maturity. Cities and inter-city organizations have set the stage for building on accumulated experience, and can now take the next steps. The systematic approach can start by formalizing and expanding the best of existing practices.

Systematic management of adaptation practices will not constrain cities' adaptation options. A systematic approach has advantages in being adaptable and evolving. No one single strategy addresses the needs of all cities. Individual cities will address specific needs while still working within the context of a practice.

## Defining the Global, City-Centric Practice

Climate adaptation efforts span three arenas of operation. City governments act independently as a first arena, but this alone results in disappointing adaptation. Aligning the efforts of businesses, real estate owners, residents and other constituencies is a second arena. Coordinating the approaches of cities around the world is a third arena. A global city-centric practice addressing these three arenas together achieves a critical mass of commitment and knowledge that will yield the best results.



An initial body of practice knowledge does not need to be created. It can be assembled from prior work and harmonized. The Joint Institute for the Study of the Atmosphere and Ocean at University of Washington in association with ICLEI identified a five-milestone approach for climate adaptation.<sup>7</sup> Based on the work in Canada, those milestones have since been updated and an associated work book created,<sup>8</sup> and the ICLEI ADAPT data base and planning tool has emerged. Many other guides

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<sup>6</sup>“CDP Cities 2012: Seven Climate Change Lessons from the Cities of Europe” <https://www.cdproject.net/CDPResults/CDP-Cities-2012-European-Report.pdf>

<sup>7</sup> Center for Science in the Earth System (The Climate Impacts Group) Joint Institute for the Study of the Atmosphere and Ocean University of Washington, “Preparing for Climate Change: A Guidebook for Local Regional and State Governments”, <http://www.cses.washington.edu/db/pdf/snoveretalgb574.pdf>

<sup>8</sup> ICLEI, “Changing Climate Changing Communities” [http://www.fcm.ca/Documents/tools/PCP/changing\\_climate\\_changing\\_communities\\_guide\\_for\\_municipal\\_climate\\_adaptation\\_EN.pdf](http://www.fcm.ca/Documents/tools/PCP/changing_climate_changing_communities_guide_for_municipal_climate_adaptation_EN.pdf)

for cities adapting to climate change have been produced, including works from World Bank<sup>9</sup>, Australia<sup>10</sup>, State of New York<sup>11</sup>, and State of California<sup>12</sup>. There is a large body of guides but many are specific to local needs and development of a set of consistent approaches across cities has not yet been achieved.<sup>13</sup> The next step is to further develop and harmonize existing practice assets, to create a formal world-wide set of practices and body of practice knowledge.

From a geographic-scope perspective, although not all experience is relevant to all cities, the larger body of knowledge resulting from a global practice representing cities worldwide will produce the greatest insights. A worldwide pool of experience provides more data points that can produce a wide range of meaningful insights. Whether a city is coastal, inland, arid, or tropical, and whether the threat is temperature, precipitation, water levels, or wind, the global practice will provide more, deeper insights.

Organizationally, a practice consists of practitioners, who work together to improve their abilities. In the case of a global climate adaptation practice, the practitioners will include city governments, and also other stakeholders, such as insurance companies and real estate owners. Climate adaptation is not a one-time effort but an ongoing cycle of preparation, response, and revision. It is a dynamic process, and one that should be revised over time based on new learning. To continue the evolution of the practice, practitioners or selected representatives of the practitioners, work together to set direction and continue the development of the key components of the practice, which are described further below.

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<http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1318995974398/GuideClimChangeAdaptCities.pdf>

<sup>10</sup> City of Melbourne, "Climate Change Adaptation Strategy",  
[http://www.melbourne.vic.gov.au/AboutCouncil/PlansandPublications/strategies/Documents/climate\\_change\\_adaptation\\_strategy.PDF](http://www.melbourne.vic.gov.au/AboutCouncil/PlansandPublications/strategies/Documents/climate_change_adaptation_strategy.PDF)

<sup>11</sup> NY State Energy Research and Development Authority, "Climate Adaptation Guidebook for New York State",  
<http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CD4QFjAB&url=http%3A%2F%2Fwww.nyserdera.ny.gov%2FPublications%2FResearch-and-Development%2FEnvironmental%2FEMEP-Publications%2F~%2Fmedia%2FFiles%2FPublications%2FResearch%2FEnvironmental%2FEMEP%2Fclimaid%2F11-18-response-to-climate-change-in-nys-annex11.ashx&ei=N1XsUNPOMYHL0wHVwYHwCw&usg=AFQjCNH1czPDU4oZ6VDtK-Q1-kBWX9IsgA&sig2=2gneZHUSYuOaF4jYEIOOnA&bvm=bv.1357316858,d.dmQ&cad=rja>

<sup>12</sup> State of California, "California Climate Adaptation Planning Guide",  
[http://resources.ca.gov/climate\\_adaptation/local\\_government/adaptation\\_policy\\_guide.html?goback=-gde\\_934207\\_member\\_196970932](http://resources.ca.gov/climate_adaptation/local_government/adaptation_policy_guide.html?goback=-gde_934207_member_196970932)

<sup>13</sup> Carbon Disclosure Project, "CDP Cities 2012: Seven Climate Change Lessons from the Cities of Europe",  
<https://www.cdproject.net/CDPResults/CDP-Cities-2012-European-Report.pdf>

information.<sup>14</sup> Because the art and science of resiliency is evolving and will continue to evolve, a global city-centric resiliency practice should be based on an approach that enhances learning. A framework of methodology, expertise, technology, and governance will improve all participating cities' abilities to adapt. Unification and standardization of techniques will provide strategic enhancements in cities' ability to baseline, measure, plan, and communicate. The result will be improved climate adaptation for all.

The global city-centric practice for climate adaptations already exists in an early, informal state. Cities working to build resiliency have developed practices on their own. They have also developed capability by learning with and from other cities. There are records of practices and accomplishments of individual cities reflecting anecdotal experience sharing that is valuable but presents a narrow view. Based on these initial results, the global practice already exists, but is at an early state of formation. As a next step in developing ability to adapt to climate change, a harmonized, common view of activities and milestones from cities will advance the capability of all cities.

## Creating the Global City-centric Practice

Cities around the world are preparing for extreme weather caused by climate change. Cities are sharing information and learning from each other via workshops, conferences and reports, but the ability to share information is hindered by absence of a unified framework. Borrowing from disciplines of network management, defense, security, finance, supply chain management, professional services, and software development, climate adaptation progress will be enhanced by investments in methodology, expertise, technology, and governance. The existing body of capabilities is a valuable start and sets the stage for these next steps:

- Further develop the methodology. Integrating the work from ICLEI, World Bank, Australia, California, New York, and other sources provides a methodology baseline. The baseline will be further developed by adding detail to milestone definitions, identifying suggested paths to achieve milestones, and sharing examples of artifacts created by cities in their pursuit of the milestones. The methodology developments should be validated by city practitioners. Broad sharing of the methodology will provide feedback to continue its improvement. The methodology will be developed with the understanding that cities may adapt it to their own

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<sup>14</sup> World Bank, "Guide to Climate Change Adaptation in Cities", <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1318995974398/GuideClimChangeAdaptCities.pdf>

needs and there is no “one-size that fits all”.

- *Formally manage expertise* - Because of the complexity and range of disciplines, managing resiliency is a new expertise unto itself. Based on the further definition of the methodology, develop profiles of skills and knowledge that are desirable for executing the steps in the methodology. The profiles will include desired backgrounds and experience. Leverage existing training offerings to create formal curriculum and certifications on the methodology for professionals with pre-requisite background and experience. Like the LEED AP Certification, a standardized repeatable certification offering for City-centric Climate Adaptation will establish a body of knowledge that is meaningful for a generalist role, such as “Resiliency Collaboration Specialist”. Initially, the critical expertise to be trained and certified is in relation to the methodology, and the ability to communicate and coordinate with a wide range of specialists. It is not expected that the training and certification on its own will be sufficient to perform a given role with a city but will be part of a set of qualifications.
- *Create a technology platform* – Use information technology selectively to communicate and facilitate. Incorporate existing carbon tracking and climate modeling software into a technology portfolio. Add to the portfolio visualization and execution-oriented social media technology to embody and communicate the methodology. The resulting portfolio of technologies will become a single platform for sharing methodology updates, experience, and progress. There is a wide range of technologies to employ in supporting resiliency, and a portfolio of technology experience will help cities know the advantages and disadvantages, much like consumer reviews. Through a formal technology portfolio, changes in technology will be introduced with shorter learning curves and less disruption.
- *Establish practice governance* – Establish a steering body to monitor results and inputs from cities on methodology, expertise, and technology. The steering body should represent the interests of the practitioners in setting policy, direction, standards for maintaining and further developing the practice. With rotating representatives from individual cities plus longer-standing representatives a governance function will embrace new ideas and provide consistency.

## Benefits

Further development of formalized and systematic approaches to climate adaptation in the form of a global city-centric practice will deliver benefits in communication, measurement, analysis, planning, and evolving. A summary of the benefits is shown in the table below.

<b>Next Step</b>	<b>Benefits</b>
Further develop and harmonize the methodology	<ul style="list-style-type: none"> <li>• A more mature methodology will provide cities with additional detail and broader input to their planning and execution efforts;</li> <li>• Based on common concepts and vocabulary, communication of plans and progress will improve both within and across cities.</li> </ul>
Formally manage expertise	<ul style="list-style-type: none"> <li>• Explicit skill profiles and progressions will accelerate development of skills through market mechanisms and training</li> <li>• Standards for skills and experience will improve skill-and-experience evaluations</li> <li>• Common vocabulary will improve ability to match jobs and job seekers</li> </ul>
Establish a technology platform	<ul style="list-style-type: none"> <li>• Knowing the experience others have had with a standard platform will improve confidence in employing technology</li> <li>• Common information formats and structures will improve ability to share information and data among cities</li> <li>• Unified portfolio definition and experience will Improve development of technology in the market to suit city needs</li> </ul>
Establish practice governance	<p>Formalized governance will:</p> <ul style="list-style-type: none"> <li>• Provide consistent progress in assessing and improving the practice</li> <li>• Establish accountability for practice benefits</li> <li>• Ensure representation and buy-in from practitioner cities</li> </ul>

## Conclusion

In preparing and responding to extreme weather caused by climate change, cities around the world are on the front lines of ability and accountability. They face a challenge of integrating disciplines and constituencies, and an opportunity to learn from the experience of other cities around the world. Cities will best be able to address the challenge of adaptation, seize the opportunity of cooperative action, and accelerate climate adaptation efforts by establishing a global city-centric practice. The practice takes existing experience the next step by formalizing methodology, expertise, technology, and governance.

Mobilization for climate adaptation is still in its early days. Most cities are doing preparatory, initial planning, or vulnerability assessment work. As of 2012 approximately 18% of ICLEI

members are currently implementing their adaptation plans.<sup>15</sup> For those that had begun climate adaptation implementation work, collaboration across the diverse set of parties is rare with only 11% of city governments worldwide reporting partnerships with business on adaptation.<sup>16</sup> It is exactly at this stage when cities need to improve alignment and apply best expertise. Delay only increases the risk that extreme weather will inflict catastrophic damage on unprepared cities. It is exactly at this stage when cities can benefit most from a city-centric global climate adaptation practice.

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<sup>15</sup> MIT/ECLEI, “Progress and Challenges in Urban Climate Adaptation Planning” ,  
<http://web.mit.edu/jcarmin/www/carmin/Urban%20Adaptation%20Report%20FINAL.pdf>

<sup>16</sup> MIT/ECLEI, “Progress and Challenges in Urban Climate Adaptation Planning” ,  
<http://web.mit.edu/jcarmin/www/carmin/Urban%20Adaptation%20Report%20FINAL.pdf>

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