

# Making Cities Resilient Report 2012

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**My city is getting ready!** A global snapshot of  
how local governments reduce disaster risk

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[www.unisdr.org/campaign](http://www.unisdr.org/campaign)



**Photo cover:** Alessandro Zanchini, Comune di Venezia.

The City of Venice joined the Campaign as a Role Model for cultural heritage protection and climate change adaptation. Venice has developed a plan with both structural and bio-geomorphological management components, including coastal reinforcement, wetland reconstruction, reclamation of polluted sites, a system of mobile sea barriers, city pavement elevation, urban maintenance, flood monitoring, early warning and public awareness. Saint Mark's Basilica: living with floods and tourists...

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## **My city is getting ready!**

A global snapshot of how local governments  
reduce disaster risk



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*Read more about the key partners in the Making Cities Resilient Campaign on page 80.*

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**“UCLG is trying to bring the topic of disaster risk reduction on the top of the agenda of local and regional authorities by mobilizing its members around the world and organizing with partners such as UNISDR regional workshops to raise awareness among local governments. There is no time to lose. The loss of more lives and property are at stake. As Istanbul’s experience shows, urban settlements must be transformed, but this process must happen with input from community members. Disaster risk reduction is not just top-down; it’s also bottom-up.”**

Kadir Topbas, Mayor of Istanbul and President of UCLG

# Foreword

## Today, a major development challenge is facing cities worldwide: How disaster resilient will their growth be ?

The question of resilience in the context of urban growth recognises that disaster risk reduction is not limited to preparedness and response, but is a key determinant for sustainable development. How cities grow – the strategic planning and design of spatial elements and their impact on the natural and built environments, the inclusion of the most vulnerable in urban planning – all dictate a city’s capacity to absorb and recover from disasters, including those driven by an extreme climate.

More than half of humanity lives in urban centres today – a figure projected to rise to two-thirds in little over a generation.

The increasing concentration of people, economic activities and assets in urban areas usually brings much increased disaster risks and also increasing climate change risks. Cities generate most of the world’s wealth and innovation - but also waste, greenhouse gas pollution and many other causes of climate change and hazards.

Many of the world’s major metropolises are coastal cities prone to flooding and erosion. Many others are located in drought-prone areas and are already suffering from water scarcity.

Building resilience to disasters requires the political will and intervention of active, competent local governments. They must be supported at the national level through strong policies and sustained, sufficient financial commitments.

All who make a city function, from municipal service providers to urban planners to the private sector and residents themselves, must be committed to building safer cities to secure resilience.

All urban governments must ensure delivery continuity for essential services during and following crises, including access to clean, piped water, sanitation and waste management, transport and energy, and safe and affordable accommodation. In those cities where capacity to do this is limited, resources must be sought and applied to ensure these systems are resilient to whatever crises may emerge. This includes the essential elements of strengthened capacity for early warning, risk assessment, and information systems on disaster risk reduction

Local and national governments in the developed world must flex their economic muscle to

build incentives that encourage people and business to make wiser investment choices that reduce risk over time. These financial mechanisms must be long-term, applicable at scale and lead to a resilience strategy for all cities.

Building resilience is a forward looking, target driven approach to urban development that uses a wide range of measures addressing all elements of urban systems. Ensuring these targets are met demands all levels of communities and governments work together to ensure the safety of all people and protect the economic, social, environmental, and cultural assets and attributes which define the unique character of each city.

As global leaders we must integrate disaster risk reduction criteria as a measure of progress for sustainable development plans and strategies. We must also strengthen local level capacity by reflecting the needs of local governments in international frameworks and promoting standards of resilience that can guide urban development and planning along a sustainable path.

Our two organizations – UNISDR and UN-Habitat—are committed to this, as are those cities, organisations, and agencies that have contributed to this report and supported the aims of the Making Cities Resilient Campaign.

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# Introduction

## Background and rationale

Today, more than half the global population resides in urban areas. By 2025, roughly two-thirds of the world's inhabitants and the vast majority of wealth will be concentrated in urban centres. Many of the world's mega-cities, characterized as those with populations exceeding 10 million, are already situated in locations already prone to major earthquakes and severe droughts, and along flood-prone coastlines, where the impacts of more extreme climatic events and sea level rise pose a greater risk to disasters. Urbanisation happening in relatively smaller cities is also a concern—particularly in regions where existing infrastructure and institutions are ill equipped to cope with disasters. The vulnerability of this new generation of urbanites will become a defining theme of disaster risk in the coming decades. Against this backdrop, the report observes two diverging trends relevant to strengthening urban resilience.

The first is one in which competent, sufficiently resourced city and municipal governments work with citizens, businesses and other stakeholders to reduce disaster risk, both through specific risk reduction policies and investments, and by improving infrastructure and the provision of services. There is much innovation to celebrate here. These policies and measures also help build resilience to climate change. There are also notable successes in cities located in low- and middle-income nations, demonstrating that resilience is not exclusive to high-income nations.

The second trend points to many cases in which national and local governments' attention to disaster risk reduction activities, or to the institutions, infrastructure and services that help build resilience, is failing to keep pace with the rapid rate of urbanization they are witnessing. There are also many cities and smaller urban centres where even the best-oriented disaster risk reduction policies have limited impact due to large deficits in critical social infrastructure and local investment capacity.

Consequently, one of the key issues for building urban resilience is how to support and learn from the innovators and leverage significant changes in city-level resilience, even where there are limited resources.

It is in this context that the United Nations Office for Disaster Risk Reduction (UNISDR) commissioned the International Institute for Environment and Development (IIED) to report on the disaster risk reduction activities being undertaken at city and municipal levels in selected urban areas.

The cities reviewed for this report all are signatories to the global campaign on Making Cities Resilient-My City is Getting Ready! UNISDR founded the Campaign in May 2010 in conjunction with several partner organizations, including the United Nations Human Settlements Programme (UN-Habitat), United Cities and Local Governments, (UCLG), ICLEI-Local Governments for Sustainability (ICLEI), CityNet, the European Commission Community Humanitarian Office (ECHO), the World Bank Global Facility for Disaster Reduction and Recovery (GFDRR), academic institutions and civil society groups. The launch of the Campaign marked a recognition of the importance of supporting local-level leadership against the backdrop of rapid global urbanisation and the role of local governments as both first responders to crises and emergencies and those responsible for local development plans, building regulations and basic services.

As of August 2012, 1,050 cities and local governments had signed on to the Campaign, and in doing so, have pledged to take steps to improve their cities' resilience to disasters. These include 29 role model cities that are recognised by the Campaign as exemplars in disaster risk management and reduction. These cities share their knowledge of best practices on a wide range of challenges, including flood management, early warning, earthquake reconstruction and legislation.

From San Francisco, Philippines, to San Francisco, California, the Campaign's constituency ranges from small municipalities in developing nations to some of the world's most populous and economically vibrant capital cities. And while there are significant differences in the ability of local governments to cope with

disasters and build resilience, there are also many similarities in the challenges they face and in their political will to invest in making their cities safer.

The focus on resilience as the theme for this report reflects a mounting recognition that disaster risk reduction, climate change adaptation and sustainable development are inextricably linked. These issues present mutually dependant challenges, which require collaborative, integrated strategies, strong governance, and innovative technological and financial solutions. Nowhere is this more evident than in cities. Complex, unique in their political and economic structures, and widely varying in the vulnerabilities they face, cities—and the growth they will experience over the next two decades—will give way to some of the 21st century's most important social and economic challenges and opportunities.

## ***Report aim and structure***

**The aim of the report** is to provide a global snapshot of local-level resilience building activities and identify trends in the perceptions and approaches of local governments toward disaster risk reduction, using the Ten Essentials for Making Cities Resilient developed by the Campaign as a framework (see back-cover). This report also analyses the factors that enable urban disaster risk reduction activities, including how the Campaign has helped improve local knowledge of disaster risk and support capacity building.

The Making Cities Resilient Campaign seeks to encourage and support all urban centers to reduce risks and become resilient to disasters. This includes urban centers that meet the conventional definition of a 'city' in terms of land size and population, as well as other sub-national administrations of different sizes and levels, including regional, metropolitan and provincial areas, as well as municipalities and townships. For the purposes of this report, the term 'city' is taken to include all these urban centers and is used interchangeably with the term 'local governments'.

The report is based on the wealth of material that cities involved in the Campaign have self-reported to UNISDR and shared publicly since 2010. This includes detailed presentations for events, award documents, and results of the HFA: Local Governments Self Assessment Tool (see Annex 3). A number of individual interviews were also conducted with city leaders in preparation for this report.

The report is divided into five chapters, featuring a combination of analysis of cities' resilience activities and short stories from cities on good practice in urban disaster risk reduction. Chapters one and two draw conclusions on the core building blocks and enabling factors for urban resilience and the Campaign's role in driving disaster risk reduction awareness and action. Chapter three identifies key trends in resilience building at local level. Chapter four reviews cities' activities against the Ten Essentials developed by the Campaign. In a look toward the future, Chapter five proposes ideas to measure cities' progress and performance as they embark on a path toward strengthening their resilience to natural hazards and more extreme climatic events.

The Annexes feature supplementary and detailed information on the methodology and various sources used to prepare this report.

## ***About the Making Cities Resilient Campaign***

Since its inception, the Making Cities Resilient Campaign has associated its brand and strategy with the people and municipal institutions who are on the front line of delivering benefits and services that enable cities to function on daily basis, making progress on economic and social development, and protect people and assets in times of crises.

The objectives of the Campaign are to support sustainable urbanization by promoting resilience activities, increasing local level understanding of disaster risk, and encouraging commitments by local and national governments to make disaster risk reduction and climate change a policy priority and bring the global Hyogo Framework for Action closer to local needs.

The Campaign framework was developed through a one-year consultative process (2008-2009), which culminated with a conference in Incheon City in August 2009, opened by United Nations Secretary-General Ban Ki-moon and led by UNISDR and UCLG. The outcomes of that meeting were captured in the “Incheon Declaration”, which rooted the campaign’s development and strategy.<sup>1</sup>

The Campaign is guided by three central themes: Know more, Invest wiser, and Build safer. These have formed the basis for the development and deployment of practical tools and resources to help support and empower local governments to build their resilience to disasters and are based on the five priorities of the Hyogo Framework for Action.<sup>2</sup>

The Campaign is responding to the trends outlined in this report in four ways.

**First**, it is helping local governments to identify options to sustain and replicate existing successes in disaster risk reduction through city-to-city learning events and the provision of practical tools and resources designed to capture and spread information on good practice.

**Second**, it is strengthening political will, governance structures, and the capacity of local governments by promoting their roles as essential drivers of ‘bottom-up’ social and economic development.

**Third**, it is helping cities leverage significant achievements in local-level resilience, even where resources are limited, by fostering partnerships between local governments, private enterprise and others, to inspire and mobilize innovative financial and technological solutions to disaster risk.

**Fourth**, the campaign is turning its attention to establishing sound planning guidelines aimed at equipping city managers and planners with flexible, locally-driven strategies to help them identify, manage and reduce risks through the construction and reconstruction of urban infrastructure and housing.

Chapter 2 of this report outlines key findings about how the Campaign has enabled cities and municipalities to build resilience.

### Across all the cities analysed in this report, the four types of activities occurring most frequently are:

1. Considering disaster risk reduction in new urban planning regulations, plans and development activities;
2. Establishing councils/committees/disaster management structures dedicated to DRM, and engaging in multi-stakeholder consultations;
3. Constructing or enhancing hazard mitigating infrastructure;
4. Establishing education/awareness/training programmes.

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1. See [www.unisdr.org/campaign/resilientcities/about](http://www.unisdr.org/campaign/resilientcities/about)

2. See [www.unisdr.org/HFA](http://www.unisdr.org/HFA)

## ***What do we mean by a resilient city?***

Although no city can ever be entirely safe from natural hazards, they can be more resilient to the destructive forces that claim lives and assets. A resilient city is characterized by its capacity to withstand or absorb the impact of a hazard through resistance or adaptation, which enable it to maintain certain basic functions and structures during a crisis, and bounce back or recover from an event (Twigg, 2007; UNISDR, terminology).

### **At the outset, the Campaign defined a resilient city as one where:**

- Disasters are minimized because the population lives in homes and communities with organized services and infrastructure that adhere to sensible building codes; without informal settlements built on flood plains or steep slopes because no other land is available.
- An inclusive, competent and accountable local government is concerned about sustainable urbanization and that commits the necessary resources to develop capacities to manage and organize itself before, during and after a natural hazard event.
- The local authorities and the population understand their risks and develop a shared, local information base on disaster losses, hazards and risks, including who is exposed and who is vulnerable.
- People are empowered to participate, decide and plan their city together with local authorities and value local and indigenous knowledge, capacities and resources.
- Steps are taken to anticipate and mitigate the impact of disasters, incorporating monitoring and early warning technologies to protect infrastructure, community assets and individuals, including their homes and possessions, cultural heritage, environmental and economic capital, and is able to minimize physical and social losses arising from extreme weather events, earthquakes or other natural or human-induced hazards.
- There is an ability to respond, implement immediate recovery strategies and quickly restore basic services to resume social, institutional and economic activity after such an event.
- An understanding exists that most of the above is also central to building resilience to adverse environmental changes, including climate change, in addition to reducing greenhouse gas emissions.

What makes a city resilient to natural and human-induced hazards can be seen as a combination of resilience accumulated through the process of urbanisation and planning, on one-hand, and the result of specific actions to reduce disaster risk on the other.

Sound development practice with good regulations, well-maintained infrastructure, capable emergency management and solid institutions, which develop participatory urban plans, provide building permits, and manage water resources and solid waste, help to build up cities' resilience over time. Political processes and decision making that have addressed particular needs, or reduced risks, as the city was constructed will provide safe, good quality living conditions for everyone and protect the most vulnerable. This type of 'accumulated resilience' makes the city function on a daily basis .

A city also builds resilience through the engagement of its government, citizens and other stakeholders in the process of disaster risk reduction, where specific actions are taken to identify, manage and lessen the impacts of natural and human-induced hazards.

The following chapters review how local governments at various stages of economic and social development, with varying sizes and facing different hazards and risks, are adopting the traits characteristic of resilient cities, and taking steps to address current gaps and challenges.

## Characteristics of cities profiled in this report

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### Santa Fe, Argentina

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**Population** 400,000. **Location:** on the flood plain of the Parana and Salada rivers, is the capital of Santa Fe's province. **Risks profile:** flooding and intense rainfall. **Santa Fe is a Campaign Role Model City** under the theme: Participatory Flood Protection.

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### Cairns, Australia

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**Population** 164,356. **Location:** a coastal town in the wet tropics, northern Queensland. **Risk profile:** cyclones, flooding, storm surge and tsunamis. **Cairns is a Campaign Role Model City** under the theme: Flood Protection and Disaster Management Coordination.

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### Tyrol Province, Austria

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**Population** 712,077. **Location:** Western Austria, consists of 9 districts with a large number of communes and cities within. **Risk profile:** floods and landslides. **Lienz is a Campaign Role Model City** under the theme: Community Based Risk Assessment Management.

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### Thimphu, Bhutan

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**Population** 79,185. **Location:** landlocked state in south Asia, Eastern of the Himalayas. Thimphu is a district in Bhutan and also the country's capital. **Risk profile:** Prone to earthquakes, landslides, cyclones, and flooding.

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### North Vancouver, Canada

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**Population** 82,000. **Location:** coastal municipality in south-west British Columbia on the mountainsides. **Risk profile:** landslides, floods and wildfire. **North Vancouver is a Campaign Role Model City** under the theme: Participatory and Proactive Disaster Risk Reduction.

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### Valle de Itata, Chile,

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**Population:** 80,762. The Itata Valley Association of Municipalities, comprises the communes of Cobquecura, Trehuaco, Coelemu, Ránquil, Quillón, Ninhue, Quirihue, Portezuelo and San Nicolás. **Location:** north west of the Bio Bio region of Chile. **Risk profile:** floods, extreme wind and rain, wildfire, and earthquakes.

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### Baofeng, China

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**Population:** 498,000. **Location:** Henan province. **Risk profile:** drought, floods, wind, snowstorms and earthquakes.

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### Siquirres, Costa Rica

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**Population:** 59,000. **Location:** Limon province, in the plane of the Talamanca mountains. **Risk profile:** floods, landslides.

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### Copenhagen, Denmark

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**Population:** 1'213,822. Capital city of Denmark. **Location:** Eastern shore of the island of Zealand, partly on the island of Amager and on a number of natural and artificial islets between the two. **Risk profile:** floods and landslides.

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### Quito, Ecuador

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**Population:** 2.24. **Location:** north-east of the country at 2,800 meters above sea level. **Profile risk:** volcanic hazards, earthquakes, landslides and floods.

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### Santa Tecla, El Salvador

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**Population:** 200,000. **Location:** part of the metropolitan area of the country's capital, San Salvador. **Risk profile:** earthquakes, landslide and floods risks. **Santa Tecla is a Campaign Role Model City** under the theme: Participatory and Sustainable Risk Reduction Policy.

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### Bonn, Germany:

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**Population:** 300,000. **Location:** about 25 kilometres south of Cologne on the river Rhine in the State of North Rhine-Westphalia. **Risk profile:** biggest threat is flooding from the Rhine and recently extreme heatwaves during summer. **Bonn is a Campaign Role Model City.**

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### Bhubaneswar, India

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**Population:** one million. **Location:** In the Khurda District, Orissa **Risk profile:** part of seismic zone III [Moderate Risk Zone], is also prone to flood, cyclone, heat waves.

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### **Pune, India**

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**Population** 5 million. **Location:** at the confluence of three rivers: the Mutha, Mula and Pavana at 560 meters above sea level. **Risk profile:** Flooding.

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### **Mumbai, India**

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**Population;** 19.7 million. **Location:** a coastal megacity built on what used to be a group of 7 islands, many areas are only 5m above low tide level. **Risk profile:** highly exposure to coastal flooding. **Mumbai is a Campaign Role Model City** under the theme: Flood Protection and Urban Regeneration.

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### **Makassar, Indonesia**

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**Population:** 1.4 million **Location:** southwest coast of the island of Sulawesi, facing the Makassar Strait. **Risk profile:** tsunamis and flooding.

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### **Jakarta, Indonesia**

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**Population:** 9.8 million. **Location:** capital city, situated in the northwest coast of Java, at the mouth of the Ciliwung River on Jakarta Bay, which is an inlet of the Java Sea. **Risk profile:** earthquakes and flooding.

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### **Mashhad, Iran**

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**Population:** 2.42 million **Location:** 850km east of Tehran at 950m elevation in the valley of the Kashaf River between two mountain ranges. **Risk profile:** floods, cyclones, earthquakes and drought. **Mashhad is a Campaign Role Model City** under the theme: Disaster Awareness and Education.

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### **Venice, Italy**

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**Population** 263,996. **Location:** on a group of 118 islands in the Venice Lagoon. **Risk profile:** highly exposed to flooding as a result of low (and falling) elevation. **Venice is a Campaign Role Model City** under the theme: Cultural Heritage Protection.

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### **Ancona, Italy**

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**Population:** 100,000 **Location:** Adriatic coast, 360 km2 south of Venice. **Risk profile:** most significant hazard is landslides.

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### **Saijo, Japan**

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**Population:** 114,625 **Location:** mountainous terrain in Ehime prefecture. **Risk profile:** exposed to extreme rainfall, typhoons, mudslides, landslides, and flooding.

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### **Narok, Kenya**

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**Population:** 60,000. **Location:** southern side of the Rift Valley and has varied topography, with a predominantly agricultural economy base. **Risk profile:** Flooding and drought.

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### **Kisumu, Kenya**

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**Population:** 200,000. **Location:** port city in western Kenya. **Risk profile:** flooding is the most significant hazard.

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### **Beirut, Lebanon**

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**Population** 1.5 million. **Location:** on a peninsula at the midpoint of Lebanon's Mediterranean coast. **Risk profile:** exposed to earthquakes, floods, wildfires and landslides.

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### **Byblos, Lebanon**

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**Population:** 100,000. **Location:** at the Mediterranean coast at 24km from Beirut. **Byblos, participated in a city to city exchange programme with Venice, Italy regarding "Protection of Cultural Heritage" under the auspices of UNISDR "Making Cities Resilient" campaign framework.**

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### **Kathmandu, Nepal**

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**Population:** exceeding one million. **Location:** capital city, is situated in central Nepal bowl-shaped valley between four major mountains, at high elevation (approximately 4600ft or 1400m). **Risk profile:** earthquakes and landslides.

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### **Telica, Quezalguaque and Larreynaga-Malpaisillo, Nicaragua**

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**Population:** 71,000. **Location:** three municipalities are in Telica basin of the Department of Leon with an extension of 1,373 Km2. **Risk profile:** volcanic, seismic, hurricanes, floods, epidemics, environmental risks linked to gold mining and mono-agriculture.

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## Pakistan

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The Provincial Disaster Management Authority (PDMA) identified 30 cities from 6 administrative regions including: Baluchistan, Gilgit-Baltistan, Khyber Pakhtunkhwa, Punjab, Sindh and Federally Administered Tribal Areas (FATA); and Azad Jammu and Kashmir. Risk profile: landslides, floods, storms, cyclones, earthquake, drought, fire, epidemics, riots and conflicts. These cities applied the HFA-Local Government Self Assessment Tool.

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## Chincha, Pisco, Cañete and Ica, Peru

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**Population:** 536,000. **Location:** Peru's Pacific coast. **Risk profile:** high exposure to earthquakes and flood.

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## Albay, Philippines

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**Population:** approximately 1 million. Albay Province, is made up of 15 municipalities, the capital city is Lagazpi, with a total land area of 2553 km<sup>2</sup>. **Risk profile:** typhoons, storm surge, volcanoes, landslides, tsunamis and floods. **Albay is a Campaign's Role Model City** under the theme: Institutionalized and Innovative Disaster Risk Management.

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## Amadora, Portugal

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**Population:** 175,135. **Location:** northwest of the Lisbon Metropolitan Area. **Risk Profile:** earthquake, flood, heat wave, land slide, technological disasters.

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## Makati, Philippines

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**Population:** swells from 510,383 to 3.7 million during daytime. The city consists of 2 congressional districts and 33 barangays, 5 of which transect the west valley fault system. **Risk profile:** earthquakes, floods and landslides. **Makati is a Campaign's Role Model City** under the theme: Applying the Ten Essentials.

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## San Francisco, Cebu, Philippines

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**Population:** 48,834. **Location:** small island within the Camotes Island group and part of the province of Cebu. **Risk profile:** floods and landslide. **San Francisco is a Role Model City** under the theme: Grassroots Disaster Management.

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## Quezon City, Philippines

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**Population:** 1,7 million. **Location:** in the area of Luzon, Quezon is the largest and most populous Local Government Unit in Metro Manila. **Risk profile:** highly flood-prone and vulnerable to earthquakes, fire and epidemic.

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## Cape Town, South Africa

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**Population:** 3.7 million. **Risk Profile:** storm surge, heat wave, floods, fires and drought. **Cape Town is a Campaign Role Model City under the theme:** Informal Settlement Upgrading and Ecosystem Protection.

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## Johannesburg, South Africa

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**Population:** 3.5 million. **Location:** in the eastern plateau area of South Africa known as the Highveld, at an elevation of 1,753 metres. **Risk profile:** intense rainfall and flooding.

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## Overstrand, South Africa

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**Population:** 76,000. **Location:** situated within the Overberg District Municipality, in the Western Cape province of South Africa. **Risk profile:** drought, flooding and fire.

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## Batticaloa, Sri Lanka

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**Population:** 515,857. **Location:** Situated in the East Province, and the administrative capital of the Batticaloa. **Risk profile:** Vulnerability to hazards have been shaped by the civil unrest in the area (civil war ended in 2009) as well as being impacted by the Indian Ocean tsunami in 2004.

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## Colombo, Sri Lanka

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**Population** 647,100. **Location:** On the west coast of the island and adjacent to Sri Jayawardenapura Kotte, the capital of Sri Lanka **Risk profile:** floods, typhoons, earthquakes, landslides, fires and tsunami.

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## Moshi, Tanzania

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**Population:** 150,000. **Location:** a market hub town in north-eastern Tanzania at the foot of Mount Kilimanjaro. **Risk profile:** drought and floods.

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## Bangkok, Thailand

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**Population:** 9.7 million. **Location:** south east Asia. **Risk profile:** most significant hazard is flooding. **Bangkok is a Campaign Role Model City** under the theme: Flood Management.

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## Istanbul, Turkey

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**Population:** 13 million. **Location:** in northwestern Turkey within the Marmara Region on a total area of 5,343 square kilometers. **Risk profile:** probability of a major earthquake in the next thirty years is estimated to be 62%.





The Punjab region, under water in 2010, led to an increased influx of people to the cities. Pakistan's local government system is weak. To improve urban risk reduction, the Provincial Disaster Management Authority encourages cities to use the Campaign tools and improve local capacity to build resilience.

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### San Francisco, California - USA

**Population:** 805,235. **Location:** West coast of the United States, at the tip of the San Francisco Peninsula including significant stretches of the Pacific Ocean, a city council in the state of California, USA **Risk profile:** Wild Fire, Tsunami, Land Slide, Heat Wave, Flood, Earthquake, Drought. **San Francisco is a Campaign Role Model City** under the theme: Advancing Resilience through the Whole Community Approach.

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### Chacao, Venezuela

**Population:** 71,000 with a floating population' of 1.5 million. **Location:** Mid-eastern portion of the Caracas Valley, north of the Guaire River, bordering the other urban municipalities to the east, south and west, and the Avila National Park to the north. Chacao is one of 21 municipalities from the state of Miranda, part of the Caracas metropolitan district. **Risk profile:** exposure to earthquake and flooding.

For more information on Role Model Cities please go to: <http://www.unisdr.org/campaign/resilientcities/cities>

# CHAPTER 1: ENABLING CONDITIONS FOR BUILDING RESILIENCE

Photo: UNISDR



Vice-Mayor Al Arquillano in San Francisco, Cebu, enabling community participation through leadership and vision. Here, discussing community-based budgets with a Purok [the community group structure below the village-level Barangays].

## ENABLING CONDITIONS FOR BUILDING RESILIENCE

Several factors will enable cities to become more resilient to disasters and motivate local governments to take action, based on an analysis of the findings of cities and local governments participating in the Campaign. These include strong leadership and political will; sustainability of institutional capacities and resources at local level; the ability to engage in high-impact activities early on; partnerships and city-to-city learning opportunities; the integration of disaster risk reduction across sectors; and recognition of the improvements needed to make infrastructure more resilient. These factors and others form the essential foundations of resilience.

### *Leadership and political will*

Building political momentum for risk reduction is a key building block for improving disaster resilience. Particularly where substantial changes to the status quo are necessary, political will is vital in terms of introducing new and progressive risk reduction practices and policies. Strong, charismatic local leadership is an important ingredient in building popular support for risk reduction. The ability to engage individuals on a personal level and stimulate the participation of multiple stakeholders is essential to the effectiveness and sustainability of disaster reduction plans. This is evident in the example from Siquirres, Costa Rica (Box 1.1), where visible leadership at the local level is forging close relationships and synergies between the local government, citizens, and the private sector, while strengthening accountability [11].

### **BOX 1.1 Political leadership and low-input, high-impact disaster risk reduction in Siquirres, Costa Rica**

Less than six months after joining the Campaign, the local government in Siquirres succeeded in securing resources for resilience-building activities, undertaking risk reduction measures in infrastructure that have reduced the incidence of flooding in its communities. They decided to start with two of the Ten Essentials: Hazard-resilient infrastructure (Essential 4) and education programmes (Essential 7) – and move towards all ten over time. These were chosen in the interest of getting things moving quickly and delivering rapid ‘concrete’ results.

#### *Prioritising simple hazard mitigation*

To date, Siquirres has implemented a small number of simple engineering solutions aimed at reducing the incidence and impact of flooding in local communities. The banks of a highly flood-prone creek have been reinforced with concrete, and in three communities, roadside pipes have been enlarged and buried underground. The visibility of these projects helped to galvanise community support for other longer-term disaster risk reduction activities.

Yelgi Verley, the young and enthusiastic Mayor of Siquirres, observes that after the implementation of these small projects, local people are more interested in disaster risk reduction because they understand their benefits. She says, “we are preventing situations from happening and people are feeling things being done. People don’t want to hear talk, they want to see things.” The success of the hazard-resistant infrastructure has been evidenced by the prevention of what were recurring annual floods. In February

2012, following the rainy season between October-December 2011, no flooding occurred. This has been accomplished in a very short time period: six months after signing on to the Campaign and 12 months into the Mayor's term.

A significant lack of government funding for resilience-building activities was overcome by engaging with private sector companies who donated the necessary materials (sand, gravel etc.) and with community associations who donated their time and labour. The donation of materials directly to the project also helped to reduce the risk of corruption.

### *The role of leadership*

This path to resilience building in Siquirres has been greatly facilitated by the enthusiasm of the Mayor and the modest sized team leading these initiatives. While national government policy requires all local governments to have an Emergency Committee to deal with post-disaster response, there is no formal organisational structure established for the coordination of proactive disaster risk reduction and preparedness. As in all cases, administrative efficiency must be balanced with the availability of resources, and in the future it may be necessary for Siquirres to call on the national government to dedicate resources to resilience-building, disaster risk reduction and preparedness. This is a strong example of how small teams can have a high impact in a short period of time and with very limited resources, a positive example for other communities experiencing similar constraints on capacity.

Local governments that have made public pledges to reduce disaster risk have increased the accountability of their local leaders. In the earthquake-prone city of Ancona, Italy, for example, citizens viewed the Mayor's 2010 pledge to the Campaign as a strong statement of local leadership, a commitment to reducing their risk of landslides, and a testament to the effectiveness of the city's Department of Sustainable Development. The official declaration of commitment to the Campaign by Baofeng, China has led to the creation of a disaster coordination framework, with an assigned budget for disaster risk reduction, and maintaining up-to-date information on potential risks, and investments in critical infrastructure [13]. United Cities and Local Governments (UCLG) and UNISDR have worked with Mayors to craft resolutions for regional workshops and congresses (globally, in Africa, Latin America and Asia/Pacific) to raise the profile of the commitments these local governments have made to disaster resilience and risk reduction.

Electoral pressure is an important stimulus for creating political will for resilience building. Some cities explicitly link public demand for disaster risk reduction activities to electoral support and political advantage. This is particularly true when it comes to infrastructure and critical municipal services. For example, the former Mayor (now Vice Mayor) of San Francisco, Cebu, Philippines, acknowledges that because he is concentrating resources on increasing community resilience, "as a politician, you can never go wrong, and at election time the people understand that you care about them, that the town is moving in the right direction." (See Box 1.1 on Siquirres.)

- **Sustainability at local level**

Political leadership and governance structures that address risk management; the knowledge and capacity of staff to articulate plans and the implementation of disaster risk reduction measures; as well as access to financing options, are all critical elements for sustainability at city level.

Frequent turnover in political leadership can impact the continuity of disaster risk reduction activities. One challenge is the length of the political term at the local level, which generally peaks at eight years. A great deal of resilience building can be done in the short term, but governance structures and the involvement of various actors must be in place to ensure the continuity and fulfilment of these shorter-term efforts and achieve sustainable resilience.

A high turnover in leadership was noted as one of the chief barriers to sustaining urban risk reduction programmes by Makati City, Philippines; Quito, Ecuador; and Kathmandu, Nepal, which recently completed a one-year City-to-City Sharing Initiative, sponsored by the World Bank Global Facility for Disaster Reduction and Recovery (See Box 1.4). Mumbai has faced similar challenges, such as the need for informed and trained local authorities to coordinate long-term disaster risk reduction actions [24]. There is no doubt that training helps, but in order to build municipal capacity for risk reduction, knowledge and learning must go beyond elected officials to reach technical and professional staff within these municipalities.

### **Box 1.2: Santa Tecla, El Salvador: The frequency of hazards impacts political will and electoral pressure**

In Santa Tecla, El Salvador, a 7.5 magnitude earthquake in 2001 claimed 720 victims, triggering a high level of community participation in public debates about the direction of risk reduction and urban development in the municipality. Santa Tecla's Mayor, Oscar Ortiz (a Champion of the 'Making Cities Resilient' Campaign), took a strong leadership role in the response and recovery work with wide participation of local stakeholders. Taking the opportunity to strengthen the city's normative frameworks, risk reduction plans and policies, he organised reconstruction committees that included the participation of the private sector, churches, NGOs and the local government. An action plan was tailored to the population's needs and a community debate – Santa Tecla for the Future—revolved around reconstruction and other opportunities to create a city in line with sustainable development goals.

The Mayor stated: "Santa Tecla will never be the same, it will be better." This conviction gave the community the will and power to move forward with risk reduction policies. The Mayor has been re-elected every time since then.

Lessons learned included the following: although disasters hurt, let's turn them into a development opportunity; reconstruction must include the vision, resources, capacity and commitment of all; international cooperation is important, but the community's strength is the key factor for success; transformational leadership is fundamental at the political, citizen, technical and business level; development is a long-term commitment; disaster risk management should be inclusive of all actors; citizen participation is key for a successful sustainable development plan.

### **Box 1.3: Dialogue contributes to sustainability in Chile's Valle de Itata**

The Valle de Itata (Chile) was close to the epicentre of the February 2010 earthquake and tsunami (the latter accounted for most of the deaths). On the first anniversary of the event, a national multi-stakeholder dialogue began with international, national and local government counterparts, academics and civil society to discuss the reconstruction efforts, lessons learned and how to improve policies. The Making Cities Resilient Campaign was launched in the region.

As a follow-up, staff from 10 municipalities are now enrolled in a training programme supported by international Campaign partners. This training programme built on local sustainable development practices, the Handbook for Local Government Leaders and the Ten Essentials, together with experience from the region. A monthly 'Dialogue on Risk' has begun in which all municipalities participate; they also directly fund the Dialogue. For the Itata Valley Association of Municipalities, the Campaign created a space to promote actions that build resilience and contribute to a culture of prevention. They have learned the lesson that communities cannot afford to wait for a disaster to strike and then be forced to work under pressure; rather they must be prepared in advance of an event. (See Box 5.1 on Quirihue's Communal Development Plan).

Similarly, clear links exist between severe hazard events and the initiation of disaster risk reduction activities in Cairns, Australia, Makassar, Indonesia, Metro Manila, Philippines, and Pune, India.

Sustainability also depends on the ability to articulate needs and secure financing. *[Read more about financing disaster risk reduction and budgets in Chapters 4 and 5.]*

- **Engage in high-impact activities early on**

Prioritising disaster risk reduction activities that are tangible, visible and can be quickly implemented makes an immediate, high impact on the community, and consequently will help to build community interest and engagement and develop broader political support, which is demonstrated in Siquirres and San Francisco, Cebu, Philippines (see Boxes 1.1 and 3.1). The need for effective and professional preparedness and response capacities, with well-defined collaboration at all levels, is critical to triggering longer-term and more structural resilience building. This is particularly valid in high-risk and high-density urban areas with recurring extreme climate events.

- **City-to-city learning and international support**

Engaging in partnerships and city-to-city learning exchanges is instrumental in building momentum for disaster risk reduction activities and sharing ideas on best practices. Alongside the Campaign, several other groups are working towards the same goal of empowering local governments to improve their resilience. For example CityNet, ICLEI-Local Governments for Sustainability, UN-Habitat, and the World Bank Global Facility for Disaster Reduction and Recovery all promote disaster risk reduction awareness, solutions, and shared best practice at local level (see Box 1.4).



A variety of hydro-meteorological hazards impact the city of Quito each year. Seismic activity is an ever-present risk. The high number of adobe and un-reinforced masonry buildings, and the fact that non-engineered construction accounts for 60% of the building stock, present a high-risk scenario that the city is responding to through institutional and policy improvements, participatory planning and awareness raising activities.

### Box 1.4: City-to-City Sharing Initiative - Makati City, Quito and Kathmandu

Based on the objectives of the Ten Essentials for Making Cities Resilient, local government representatives from all three cities participated in a series of exchanges to share best practices and experience in managing and reducing urban risk through improved land use planning, emergency management, and heightened public awareness. Kathmandu and Quito used Makati City’s approach to emergency management systems and community-based disaster management to benchmark their own plans in these areas, while Makati learned from Kathmandu’s experience with private sector organisations on disaster risk management and public awareness campaigns. City representatives also shared preservation and rehabilitation strategies to protect their cultural heritage. Under the programme, supported by the Global Facility for Disaster reduction and Recovery, the participating cities also act as international and regional resource centers with other cities in their respective countries and regions.

CityNet recognised their achievements and the cities were presented with a City-to-City Cooperation award in July 2012.

*Example of model template on public awareness campaign plan for disaster risk reduction, from this initiative*

Objective 1. To prepare a sound and effective Public Awareness Campaign on Disaster Risk Reduction Management (DRRM) of the City of ____							
STRATEGIES	ACTIVITIES	DESCRIPTIVE OUTPUTS	QUANTIFIABLE OUTPUTS	MEANS OF VERIFICATION	BUDGET	IN CHARGE	TIME FRAME
Gather and analyze data that will help to identify and prioritize the elements that the Public Awareness Campaign must address awareness on DRRM in the city.	Conduct overall survey and database collection on the City of	Compilation of existing PAC materials	___existing PAC materials	Compilation of existing PAC materials			
	Including current issues, problems and constraints on public awareness of the city	Inventory of data and available information	___ files of data and available information				
		Prioritized elements in the PAC Plan	___elements to be included in the PAC Plan				
Gather and analyze data on population, demographics, etc	Collect needed date for easy reference when preparing for the workshop	Compilation of secondary data made available for the PAC Plan preparation	___files available for use during the PAC Plan preparation	Files available and easy to access during the PAC Plan preparation			
Conduct Citywide Planning workshop 1: To prepare and develop the campaign plan considering the issues, problems and constraints on public awareness in	Prepare the agenda of the workshop	A workable and realistic agenda	Prepared agenda for the workshop	Workshop conducted according to plan			
	Prepare the list of participants for the workshop	List of participants to be invited to the workshop	Confirmed list of participants for the workshop				
	Invite resource persons/speakers for Planning Workshop 1	List of resource persons/speakers for Planning Workshop 1	Confirmed list of resource persons/ speakers for Planning Workshop 1				
	Activities during Planning Workshop 1: Participants will prepare a matrix on the issues, problems, information gaps and constraints of public awareness of the city.	Matrix on the issues, problems, and constraints of public awareness in the city	Issues, problems, and constraints identified and prioritized  Identified information gaps and needs  Prioritized information gap/ needs				

## • Integrating disaster risk reduction as a cross-scale and multi-sector issue

Mainstreaming and integrating risk reduction activities means that hazards, risks and vulnerabilities are accounted for in on-going and future in all of the urban systems, and programmes, so that risk reduction measures becomes institutionalised and embedded in the standard operations of municipal departments. Integrating disaster risk reduction into development activities is an important way in which cities provide the enabling conditions for building resilience. The importance of risk reduction and adaptation within wider sustainable development objectives is emphasised in the Hyogo Framework for Action (HFA).

Several municipalities have integrated disaster risk reduction into urban development processes. Makassar has integrated risk reduction principles into on-going settlement upgrading projects; Quito views disaster risk as a cross cutting issue in all of its planning and development activities. In Ancona, Italy, the municipality has made the jump from focusing just on landslides as an isolated problem, to seeing disaster risk reduction as a core component of city development, relevant to multiple sectors. Cape Town has found that participating in the Campaign and applying the tools has improved cooperation among existing departments on risk reduction and climate adaptation.

## • Addressing existing infrastructure deficits

History shows that cities with higher levels of socio-economic development have a head start when it comes to resilience building. This is illustrated by the much lower fatality rates resulting from disasters in developed countries as compared to low and middle-income countries. Ageing building stock is a major problem in most cities at all development stages and is often cited by Campaign cities as a major risk factor. Collapsing buildings due to insufficient quality and age becomes a hazard itself. This demonstrates that good infrastructure planning and building can be an essential component of disaster resilience [see more on planning and resilience in Chapter 5].

Local governments in rapidly expanding cities with a considerable number of unconsolidated informal settlements face daily struggles to meet basic urban infrastructure needs, such as clean piped water, drainage systems and waste management. This is often their greatest challenge. It can mean that disaster risk reduction takes a back seat to development activities. In Pakistan for example, until now, resilience has been constrained by poor infrastructure, weak institutions and lax enforcement of planning regulations [62]. Similarly, in Narok and Kisumu, Kenya and Moshi, Tanzania the municipalities' limited capacity, knowledge and capability for coordination means that disaster risk reduction remains a low priority due to competing issues that also require attention. For these cities, risk reduction is predominantly about developing basic infrastructure that can help to reduce risks posed from hazards and improve health.

Integrating development objectives and disaster resilience is seen as particularly important in Batticaloa, Sri Lanka, which has suffered from major infrastructure deficits and extreme poverty as a result of ethnic conflicts (civil war ended in 2009) and the impact of the 2004 Indian Ocean tsunami. Responding to these development challenges has been seen as an opportunity to simultaneously reduce disaster risk, alleviate poverty, and empower communities.

For Batticaloa and many other cities, participation in the Campaign is a step towards sustainable development [63]. The next chapter outlines how the Campaign is enabling, and, in some instances, improving cities' disaster risk reduction activities.

### **Box 1.5: Disaster resilience across sectors and scales in Makati City, Philippines**

Makati City has a sophisticated and efficient disaster risk management system, in which disaster risk reduction, preparedness and emergency management are fully institutionalised, with dedicated organisations and direct funding for disaster risk management at the local government level. The city takes a holistic approach to resilience, recognising that it requires coordination between sectors and a governance system where disaster risk reduction is mainstreamed into other core activities. Four examples of the integration of disaster risk reduction into other sectors are cited: urban planning, health, disaster response and risk governance at different governance levels.



## ***Resilient urban planning***

The Urban Development Department implements the Comprehensive Land Use Plan (CLUP) and Zoning Ordinance (ZO) to ensure that new and existing facilities are CLUP and ZO-compliant before granting locational clearances, which is an innovative feature of the City's permit application process. The Zoning Ordinance incorporates health and safety considerations and risk parameters into land use regulations. It requires, for example, an engineering, geological and geophysical assessment report for high-risk areas, although enforcement of this can be a challenge. Compliance with safe building codes is overseen by the Office of the Building Official, in cooperation with the private sector and professional 'watchdog' organisations that conduct annual inspections, provide training and support in risk-sensitive planning and construction, and manage a certification mechanism.

One concrete example of resilient site redevelopment planning is the Makati Risk Sensitive Urban Redevelopment Planning Project (RSURP), a pilot project undertaken in a high-risk Barangay (Barangay Rizal) that aims to reduce physical, social and economic vulnerability through comprehensive land use planning and disaster risk reduction.

## ***Health***

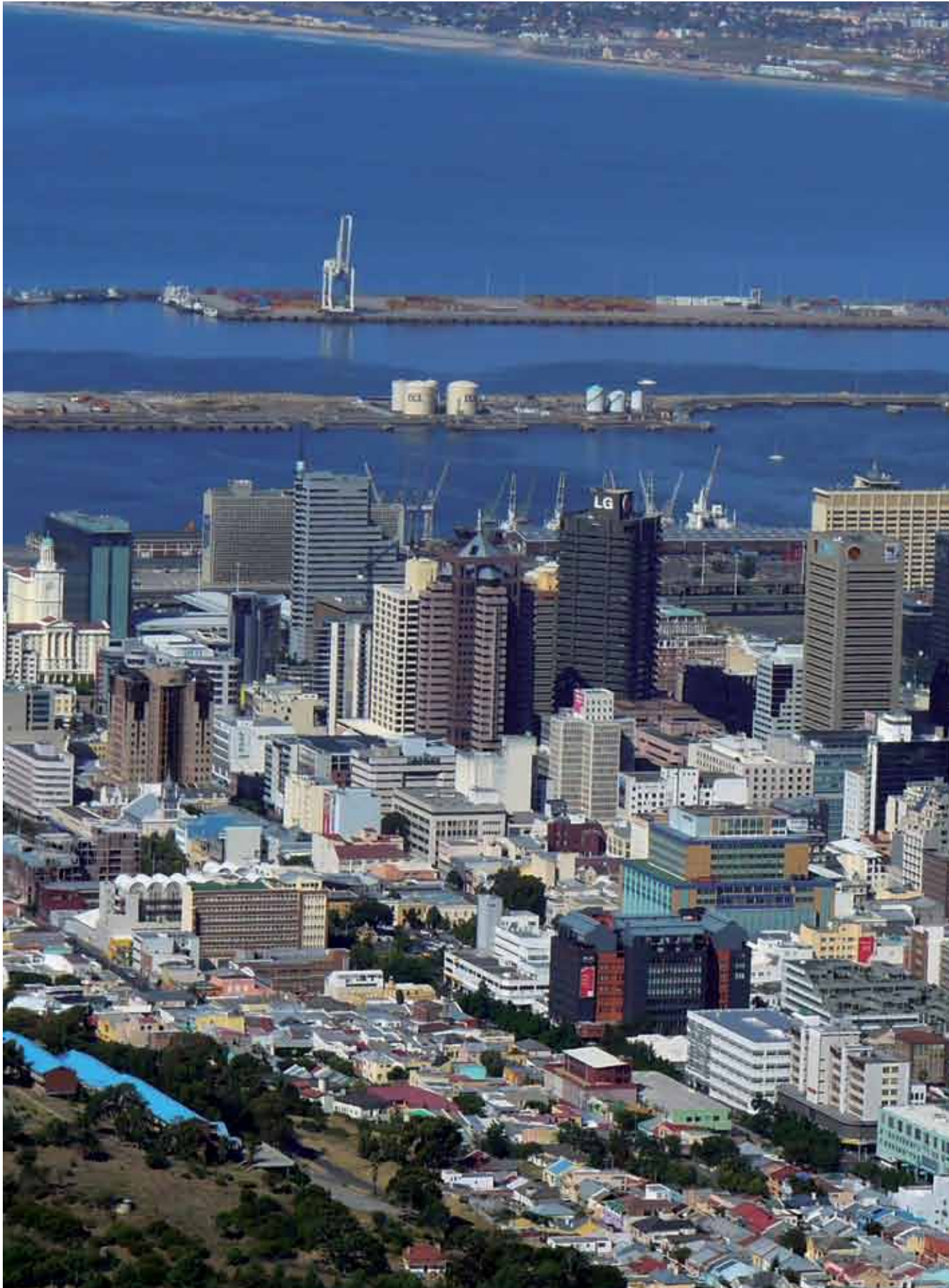
Disaster management is incorporated into healthcare in Makati through the Makati Emergency Medical Services Systems (MEMSS), which coordinates mass casualty operations. The emergency department of Ospital in Makati serves as the pilot agency for mobilising the flow of medical services, supported by Barangay health centres, which provide extension services. These have been assessed as 'relatively safe' according to 'safe hospital' indicators, meaning they will continue to function in case of disaster, have contingency plans and trained personnel. To help ensure public access to healthcare facilities in disaster situations, the city has implemented a HealthCard Programme as part of the wider Makati Health Programme. The HealthCard Programme is implemented citywide for all health care services and provides free medical and diagnostic services and a 50% discount on maintenance medicines.

## ***Coordination of disaster response across sectors***

The Makati Command, Control and Communications Centre (C3) is responsible for central coordination of early warning and emergency response. The C3 is a component of the Makati City Disaster Risk Reduction Management Office (Makati DRRMO), which is the implementing arm of the Makati Disaster Risk Reduction and Management Council (Makati DRRMC), chaired by the Mayor. The C3 acts as the city liaison between and among national government agencies, NGOs, private entities and communities in times of disaster, to issue warnings to communities and coordinate medical, public safety, and technical rescue responses. The C3 uses a variety of technologies for disaster management, including: real-time video surveillance; a GIS system to track patrol units, ambulances, and rescue vehicles; and a radio dispatch system to coordinate responses by monitoring and coordinating the distribution of resources.

## ***Risk governance at all scales***

A key factor in Makati's resilience is the involvement of all levels and sectors of society, particularly the active role of Barangays, which exist at a sub-city level. Barangay Disaster Risk Reduction and Management Committees are the implementing arm of the Makati DRRMC at community level. Their multi-sectoral membership includes youth, environmental and women's groups. Information, Education and Communication (IEC) campaigns targeting local officials, schools and communities have been used to raise public and organisational awareness of disaster risk reduction. Drills and simulation exercises are also held on a regular basis. In collaboration with the Makati Branch of the Philippines Red Cross, the C3 delivers community preparedness and emergency management training courses at Barangay level. This helps to ensure that all levels of the governance structure have a solid level of preparedness. In addition, the city publishes monthly publications, brochures, and posters with risk management messages in local languages and conducts regular Barangay Ugnayan (community dialogues) to discuss disaster risk management issues.



Cape Town is a Campaign Role Model in recognition of its innovative approach to informal settlement upgrading and ecosystem protection. Its Community Action Plan defines short-term interventions (such as clearing storm water drains and social interventions), medium-term interventions (such as simple infrastructure) and long-term visions on how to transform and integrate informal settlements.



# CHAPTER 2: HOW THE CAMPAIGN IS ENABLING CITIES TO BOOST DISASTER RISK REDUCTION

Photo: Jaime Valdes



One year after the 8.8 magnitude earthquake in Chile, Talca citizens commemorate with public culture: « Despite having lived a historic disaster we continue with the idea of re-birth.... better future ».

## HOW THE CAMPAIGN IS ENABLING CITIES TO BOOST DISASTER RISK REDUCTION

The Making Cities Resilient Campaign is playing an important **advocacy role** for disaster risk reduction at the global level, while presenting disaster risk information in an engaging and accessible format for local leaders and providing them with essential resources to take stock of, and improve, their activities. This Chapter outlines the value of the Campaign to date as an enabler of urban resilience building, based on the evidence presented by cities and interviews with local governments conducted for this report.

Since its launch in May 2010, the Campaign has produced a number of tools to help local leaders assess, monitor, document, and improve their disaster risk reduction activities. These include: the Ten Essentials for Making Cities Resilient Checklist, the HFA Local Government Self-Assessment Tool, the Handbook for Local Government Leaders on How to Make Cities More Resilient, and a comprehensive website<sup>3</sup>. The Campaign has also engaged in a wide range of meetings and technical support activities with city leaders, both internationally and at the regional level (see Annex 3 for a timeline of the Campaign's activities).

In November 2011, a meeting of Campaign partners took place in Geneva, preceded by a survey of Campaign partners and cities, which identified some of the Campaign's strengths, achievements and challenges (see Box 2.1).

### Box 2.1: Cities recognise the added value of the Making Cities Resilient Campaign

Representatives of cities who benefit directly from the Campaign, said its added value lies in:

- Enabling city authorities to gain greater visibility for work already being done on disaster risk management and disaster risk reduction.
- Providing a framework for dialogue between stakeholders from different disciplines that supports cities as they conduct disaster risk self-assessments.
- Creating a ready-made platform for city-to-city exchange at an international level.
- Enabling cities to receive recognition from UNISDR, through the Role Model City framework, the UN-Sasakawa Award for Disaster Risk Reduction, and other frameworks associated with the Campaign.
- Drawing media attention to disaster risk reduction, which in turn triggers greater accountability among local government authorities as well as citizens.

For many cities, signing on to the Campaign and committing to its disaster risk reduction principles, which are underpinned by national and international declarations, demonstrates a strong **sign of political will**. The Campaign is also a powerful local recruiting tool, having brought disaster risk to the attention of a wide range of stakeholders from a cross-section of legislative scales and sectors.

The straightforward simplicity of the Ten Essentials is a key strength of the Campaign. These guidelines provide local leaders with a strategic framework to prioritise areas and approaches to disaster risk reduction and to chart progress. Through its tools, resources, website, events and partnerships, the Campaign provides a critical forum for local authorities to raise awareness, learn about disaster risk reduction, share ideas, and identify concrete solutions. The association with a UN-affiliated global Campaign gives local authorities at all levels a sense of empowerment, which, more often than not, is translating into tangible actions and policies.

For cities that had not previously addressed disaster risks, the Campaign is an effective catalyst to begin risk reduction planning. In Dubai, the Campaign has been instrumental in making disaster risk reduction

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3. See [www.unisdr.org/campaign/resilientcities](http://www.unisdr.org/campaign/resilientcities)

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**“Without the Campaign, we would not have moved this fast. If I had not signed on to the Campaign, I’m not sure we would have reached out to do the things we are doing now. To have begun my own Administration with this Campaign has brought about a complete change in my focus as Mayor.”**

Yelgi Verley, Mayor of Siquirres, Costa Rica.

a priority objective. In Beirut, Lebanon, signing on to the Campaign has helped to focus the activities of the new city council on risk reduction. Since October 2010, the city has allocated a budget for disaster risk reduction, developed a risk database and is conducting risk assessments and developing a disaster risk reduction master plan [41]. In Siquirres, signing on to the Campaign was the impetus for stepping up disaster risk reduction awareness and planning efforts and engaging with the private sector to secure resources for basic infrastructure improvements [11]. *Read more in the section on private sector engagement in Chapter 4.*

The recognition of role model cities<sup>4</sup> as repositories of good resilience-building practices has helped move forward the disaster risk reduction agenda among local governments. Role models actively participate in global and local city-to-city learning events and workshops, spreading the word about the importance of disaster risk reduction and sharing experiences and solutions. [65]. See the section on city-to-city learning in Chapter 1.

Cities such as Ancona also cite the value of the Campaign in providing a needed networking forum through which cities at more advanced stages of resilience building can offer technical knowledge and examples of effective risk reduction approaches. For example, involvement in the Campaign has opened access to technical assistance on disaster risk reduction from institutions such as the Earthquakes and Megacities Initiative (EMI), the Asian Disaster Preparedness Centre (ADPC), the Japan International Cooperation Agency (JICA), the United Nations Development Programme (UNDP), ICLEI and UN-Habitat, among others. In Kisumu, JICA is supporting training in schools [where evacuation centres have been built] and awareness-raising initiatives in local community. Mumbai, Istanbul, Makati City, and Dubai are among the cities that have received support from external organisations during the planning process<sup>5</sup>.

Many of these partners have a long history of engagement with local governments and robust programmes that support local level resilience. The Campaign has complemented these efforts by increasing its outreach to cities and refining and expanding upon the existing tools and resources available to local leaders.

The Campaign’s success to date is partly a product of the activity and well-recognised status of its partners [65]. For example, the involvement of the municipalities of Valle de Itata in the Campaign enabled them to receive training from UN-Habitat, the Swiss Territoires Solidaires, and UNISDR, to build disaster risk reduction capacities. In Telica, Nicaragua, the Campaign has acted as a catalyst for disaster risk reduction, led by local governments in three municipalities (Telica, Larreynaga-Malpaisillo and Quezalguaque). Nicaragua’s National University of Engineering helped these and other municipalities to develop site-specific risk assessments and provided additional training for technical staff. The national authorities and national government then recruited additional actors, such as the Red Cross, as well NGOs and the private sector [see Box 2.2 on how Telica is using the Ten Essentials as a framework].

Many cities have highlighted the value in the process of applying the HFA Local: Local Government Self-Assessment Tool. This has helped spur discussions about disaster risk reduction, stimulated interest and a demand for further information about risk, helped to diagnose current weaknesses, and embed disaster risk reduction in broader urban activities.

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4. See [www.unisdr.org/campaign/resilientcities/cities](http://www.unisdr.org/campaign/resilientcities/cities) for a list of Role Model Cities to date.

5. See more under Essential 6.



Photo: UNISDR

The population of the city of Mashhad, a megacity and the second largest in Iran, is expected to double in the next ten years. As a Campaign Role Model City with innovative urban regeneration projects that embrace high seismic standards, Mashhad has created the capacity to support other municipalities in Khorasane Razavi Province (and other megacities in Iran) to develop standards, disseminate experience, and host training and drills on disaster risk reduction.

In the cities of Narok, Kisumu and Moshi, for example, the consultation process for the application of the self-assessment tool has provided a concrete opportunity to discuss disaster risk reduction. As a result of taking part in the assessment, city knowledge and networks have expanded and stimulated further interest and demand for information [40].

The process of applying the assessment tool has also encouraged governmental departments to work more closely together, to understand their specific roles and responsibilities in risk reduction, and to embed risk reduction activities across departments and sectors. Using the tool has also inspired cities to expand multiple stakeholder participation. They are encouraged to work together to assess the gaps and challenges that remain in reducing disaster risk. Twenty-three pilot cities used the tool in 2011, and many other Campaign cities are now in the pipeline. See Box 2.3 for examples of the impact of the Local Government Self-Assessment Tool on city resilience activities.

More often, national governments are using the Campaign to support stronger local level capacities to deliver national policies on disaster risk reduction. Countries like Argentina, Lebanon, Indonesia, Philippines and Sweden are promoting the Campaign's objectives and tools directly to local governments through their disaster management offices and National Associations of Municipalities. Argentina is using the Campaign to develop a comprehensive local risk management proposal for building urban resilience. The proposal identifies four priorities, which the Argentine government has offered as guidance for the Campaign's next phase of development. These include: (a) influencing institutional change, (b) introducing legislative changes, (c) putting change into operational practice, and (d) training.

Cities have outlined further challenges they would like to see the Campaign address going forward [65]:

- **More guidance on how to implement disaster risk reduction measures** and design appropriate policies.
- The Ten Essentials and the HFA Local Government Self-Assessment Tool are good starting points for **monitoring**, but more information is needed on how to validate the actions taken.
- More action is required on **linking city activities to existing and on-going national programmes** and projects, as this is crucial for sustainability.

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**“Not knowing about disaster risk is a dereliction of duty. The Campaign gives every city an opportunity to see itself as part of a global network to reduce disaster risk, which ought to be part of every government’s core mandate. Through its various tools, resources and training events, the Campaign serves an important function in raising awareness of disaster risk to both local and national levels.”**

Hon. Lianne Dalziel, Member of Parliament, Christchurch East, New Zealand

## Box 2.2: How has Telica, Nicaragua used the Ten Essentials to reduce risk?

- a) **Incorporating risk management** into municipal planning.
- b) **Organizing and enabling local structures** to move forward in dealing with hazards and local development.
- c) **Developing capacity building** processes to increase self-sufficiency in disaster situations around the theme: 'Only the community can save the community.'
- d) **Implementing land use planning strategies** to frame development and avoid exposure to unnecessary risk.
- e) **Strengthening technical capacities** to improve understanding hazards and creating a stronger disaster preparedness and response system.
- f) **Adopting an environmental plan** to preserve and maintain natural resources and establish a culture that clearly sees the advantages of using them wisely.
- g) **Developing a Risk Management System** that compiles up-to-date information about financial and human resources in an emergency.
- h) **Maintaining a disaster relief fund** to respond effectively and quickly to an emergency situation.
- i) **Forging strategic alliances** with the private sector and other actors to support discussions and projects with new ideas and inputs, unifying criteria and resources for a productive information exchange for risk reduction investment
- j) **Advocating the decentralization** of resources and investment in projects that reduce vulnerabilities.

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**“There’s now an understanding of how we need to integrate with each other. The Campaign has given people the opportunity to understand the role of disaster risk management and how they can make a change in doing bottom line risk reduction.”**

Charlotte Powell, Director, Public Awareness and Preparedness, Disaster Risk Management Centre, Cape Town.





Photo: Jaime Valdes

Telica, Nicaragua is working with neighbouring municipalities to improve their resilience and technical capacities, and to prepare a strategic development plan to protect the region

### Box 2.3: What has the HFA Local Government Self-Assessment Tool brought to cities?

Cities that have used the Self-Assessment Tool have outlined a number of positive outcomes from participating in this process:

**Makati-** The multi-stakeholder dialogue approach that is part of the self-assessment process encouraged discussions on new disaster risk reduction projects.

In various cities in Pakistan which are at the early stages of resilience building, the use of the tool helped to reveal weaknesses and identify priority areas for action. Many cities have recognised that the role of local government must be strengthened to improve disaster risk reduction. Some plans and capacities do exist at district, but not city level. Multi-stakeholder meetings in cities, tied to the self-assessment, have been useful in identifying challenges to overcome and capacities to enhance [62].

**Makassar-** the self-assessment identified the low capacity of local authorities [30]. The Makassar Government has committed to integrating the self-assessment tool into the disaster management agency's strategic programmes for 2011-14. The results will be used to prepare the Makassar State of the Environment Report and in plans for land use and economic development 2011-2031 [20].

The Philippines welcomed the use of a standardised assessment tool to raise awareness of existing capacities at national level. The archipelago has linked this tool to existing national HFA monitoring [2].

In Johannesburg, South Africa, the self-assessment process has inspired multi-stakeholder consultations with community councillors and leaders, staff from different municipal departments, businesses, NGOs, and research institutions.

In Cape Town, the self-assessment process encouraged departments to work more closely together and led to more collaborative projects [8].

In Santa Fe, Argentina, the self-assessment process is enhancing dialogue between the local and national government. The government also believes it could be a useful tool for monitoring progress in the future [54].

# CHAPTER 3: KEY TRENDS ON RESILIENCE-BUILDING IN CITIES

Photo: United Nations



## KEY TRENDS ON RESILIENCE-BUILDING IN CITIES

There response to urban risk varies widely at city level, depending on the environmental context, the size of the city, and the stage of the city's development. A comparison of how cities are addressing risk offers unique insight into the meaning of resilience at city level – how it is understood and how it is implemented – with notable differences in the type of activities undertaken by cities in different environmental and developmental contexts, and those at the early versus more advanced stages of resilience building. This section explores some of the key trends emerging, based on the activities cities are pursuing.

**Across all the cities analysed in this report, the five types of activities occurring most frequently are:**

1. Taking disaster risk reduction into account in new urban planning regulations, plans and development activities;
2. Establishing councils/committees/disaster management structures dedicated to disaster risk reduction;
3. Constructing hazard-resistant infrastructure or improving existing facilities;
4. Establishing education/awareness/training programmes;
5. Organizing multi-stakeholder dialogues.

Another important trend is the extent to which cities are integrating disaster risk reduction into other local government activities, including education, livelihoods, health, environment, and planning, either by incorporating risk considerations into existing activities or initiating projects that address multiple issues simultaneously. This trend is noteworthy for those who identify the reduction of baseline vulnerability factors as a prerequisite to resilience [see Wisner et al 2004].

### *Early versus advanced resilience-building activities*

Among the responses observed in cities at the early stage of resilience building is the creation of new disaster risk reduction committees or working groups that provide a dedicated space to discuss risk issues. An example is in Rwanda, where UN-Habitat has assisted the central government to roll out a national programme institutionalizing disaster risk committees in self-selecting urban municipalities. Other activities taking place among cities at early stages of resilience building include:

- Undertaking risk assessments (Pune)
- Applying simple structural solutions to mitigate hazard impacts (Squirres)
- Taking environmental protection measures such as tree planting or wetland conservation (Kampala)
- Writing city development plans (Thimphu).

*Read more about what these cities are doing in Chapter 4.*



"Think big-start small: Community tackles incremental improvements to access roads, drains and solid waste management, using municipal excavator and trucks.

Cities at a more **advanced stage** of resilience building (such as those in South Africa, the Philippines, India and Italy) are characterized by:

- Existing national and city level disaster risk reduction institutions;
- Centralized coordinating mechanisms to act as a liaison point between all relevant actors in case of an emergency;
- Education programmes to ensure that the public and organizations have a high awareness of disaster risk reduction issues and their respective roles.

Establishing effective institutions that understand and can respond to known sources of risk in a city requires building and maintaining a body of technical knowledge and expertise. Having up-to-date databases and hazard risk maps, which are used by policymakers to inform decisions about urban planning and development, is a characteristic of cities at a more advanced stage of disaster risk management (see Box 4.6 in Chapter 4). Other activities that are characteristic of later-stage resilience building include institutionalization of community participation (such as in North Vancouver and San Francisco, USA), and fostering multi-sector, cross-scale and international partnerships (for example, Albay Province).

### ***Level of socio-economic development***

The cities at the earliest stages of resilience building within our sample - Kampala, Kisumu, Moshi, Narok and the cities from Pakistan - all are located in low-income countries, which indicates an association between resilience and the level of socio-economic development. In these cities, resilience has been constrained by a lack of data on local risks, low financial and human capacity, poorly maintained and deficient infrastructure, and inadequate channels of risk communication between state and city governments and communities. Low socio-economic development and high poverty levels in these cities have meant that, to date, disaster risk management has remained a low priority, with limited resources for emergency preparedness and recovery; the main priority has been on improving basic infrastructure.

These issues need not necessarily constrain all resilience building activities, as illustrated by the experiences of other low-income cities that have adopted innovative strategies to locate resources. These include micro-insurance, micro-health cover and other micro-finance schemes such as those in Rwanda and San Francisco (Philippines) [Box 3.1; *read more in Chapter 4*, Box 4.5 about how the Philippines is financing resilience]; channelling money for disaster response through other departments (such as Health Emergency Management Staff funded by the Philippines' Department of Health); private partnerships to secure donated materials in Siquirres (Costa Rica); and partnerships with local and international NGOs in Moshi (Tanzania) and Makassar (Indonesia). Funding is also frequently sourced from multi-national and bilateral donors such as the European Commission, World Bank, or UN subsidiaries. In cities such as Makassar, Mumbai and Makati, improvements to urban hazard mitigation infrastructure is undertaken in conjunction with slum upgrading programmes and improvements to sanitation and waste management – an approach which simultaneously pursues both resilience and urban development objectives. This is cost effective and contributes to a positive cycle of mutual reinforcement between vulnerability reduction and risk management.

### Box 3.1: Community engagement and decentralisation in San Francisco, Cebu, Philippines

San Francisco is a small island municipality within the Camotes Island group, which is part of the province of Cebu. It consists of 15 barangays (12 are coastal), which cover a total of 10,597ha. The municipality has a total low-density population of 48,834 (2007). The town has received numerous awards and international accolades for its work in DRR and resilience. The former Mayor and current Vice Mayor, Alfredo Arquillano, cites this success to a youth and community –centered engagement approach, which integrates DRR into environmental and social development programmes, which prioritise selected resilience targets that are practical and tangible in the eyes of the local community. These include solid waste management, tree planting, mangrove rehabilitation and integrated farming. Children and youth are engaged in all aspects of resilience building. For example, student leaders participate in local government decision making through the Local Disaster Coordinating Council (LDCC). There are child-led risk assessments and an early warning system, and children participate in community drills and simulation exercises. Out-of-school youth have participated in training exercises on search and rescue, emergency response and swimming. Together, these approaches aim to address disaster risk, social vulnerability and environmental sustainability in a mutually reinforcing way.

Resilience building has also been aided by a decentralized governance system. Since 2004, Puroks, the community group structure below the village-level Barangays, consisting of between 40 and 100 households, each have an elected President who leads a monthly community meeting. The regularity of these meetings ensures on-going community consultation and continuous education about current risks and community activities. Participation and commitment are incentivized through cash awards available to high-achieving Puroks that deliver on their key objectives (which include meeting regularly and complying with guidelines around segregated waste and maintaining backyard gardens). They are encouraged to use this capital either as reinvestment, to establish micro-finance lending systems to stimulate and support the local economy, or as savings in case of emergencies. The Purok system has been important in mobilizing and empowering communities by connecting them into a wider model of participatory governance. The system undergoes regular evaluation to ensure continuous improvement, using indicators developed to measure success.

Another characteristic of early resilience building in some low-capacity contexts is activities driven by central government supported by multi-lateral agencies, rather than from within city or municipal governments themselves. In both Pakistan and Rwanda, early resilience building is initiated through a top-down process in association with UNISDR and UN-Habitat. This may be a reflection of the current weakness of local government authorities in these countries, and the low capacity of national government, which require support and resources from outside agencies. The evident commitment to risk reduction from national government in these cases will hopefully facilitate resilience building at municipal level, by decentralising resources and providing a supportive legislative framework.

The main advantage, in terms of resilience, of an urban context that enjoys a higher level of socio-economic development is the availability of more resources and funding for complex hazard management, forecasting and early warning systems. Venice, for example, has a high level of socio-economic development and a sophisticated hazard mitigation system: the MOSE system (Box 3.2).

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**“Changing attitudes and behaviours is a tough undertaking, but I never give up. It’s necessary to start small and with those who are willing. You have to show people actions with high impact, and then they will join the effort and become organised. It took me five years to accomplish that.”**

Alfredo Arquillano, Vice Mayor,  
San Francisco, Philippines

### Box 3.2: Living with floods while protecting cultural heritage in Venice, Italy

Venice is among the world's most beautiful historic cities and is a UNESCO World Heritage Site. A high proportion of the city's economy is tourism-based, and protection of the city's cultural and historic assets is essential to its identity, development and economy [50]. Venice is located on a group of 118 islands within the Venice Lagoon and is highly at risk of flooding because much of the city is at an elevation only slightly above sea level. The measures that Venice has taken to manage flood risk and protect its cultural heritage have earned it status as a Campaign role model city. Their approach has been 'living with floods' rather than 'fighting floods' and a combination of structural and non-structural measures have been taken [53].

Risk management in Venice has received support from a multi-level committee, chaired by the President of the Council of Ministries, which approved a general plan of interventions for safeguarding the city. The plan includes both structural and bio-geomorphological management approaches, including coastal reinforcement, morphological restoration (including wetland reconstruction), reclamation of polluted sites, a system of mobile sea barriers, city pavement elevation, and urban maintenance [50]. The most significant structural project is the MOSE system, a mechanical barrier system designed to protect the city from high tides over 110cm [52]. The local municipality also invests in flood monitoring, forecasting and communications to increase public awareness and preparedness. Venice exchanged its experience with Byblos, Lebanon in 2011, so that Byblos could learn from the city's success. [50].

Many large, highly developed cities also have universities and other academic institutions with which local governments can collaborate on hazard and vulnerability research. This contributes to the design of high-quality risk management policies and planning. These institutions are a valuable source of expertise and resources [both technical and financial] for research. Less developed or smaller cities without such institutions 'in house' can also form productive partnerships with academic institutions from other cities or countries, such as Batticaloa's relationship with the University of Salford.

More significant than municipal wealth is the fact that resilience, like development, is a product of good governance. The experience of municipalities shows that those with proactive, responsive, accountable and transparent government structures at local and national levels are able to achieve higher levels of resilience than poorly governed ones. This translates to well-designed policies that are informed by current risk information, enforcement of these policies in practice, enabling this enforcement through the provision of training and resources, and ensuring the delivery of finances and resources by maintaining non-corrupt and reliable distribution systems. The experience of cities shows that in both low and high-income contexts, it is the quality of governance that is the ultimate determinant of resilience.

Many cities value the role of community participation within the governance structure, both as a means of consultation to ensure the suitability of activities within the local context and as a source of micro-level data. Evidence from the cities suggests an association between the level of public engagement and participation in disaster risk management and the size and dominant economy base of the city. While some large cities (such as Mumbai) have struggled with public engagement, other smaller towns and provinces with relatively lower-density populations and more rural-based economies (agriculture, fishing etc.) have had greater success with participatory approaches. Overstrand (South Africa), San Francisco (Philippines), Albay Province, Siquirres and the Quirihue (Valle de Itata Chile) are the best examples of this. In areas that also have high poverty levels, participatory approaches are particularly effective where disaster risk reduction has been integrated into projects that promote sustainable livelihoods and social welfare. Some cities argue this is because people are more available to take part in risk reduction activities and are motivated to do so by the prospect of personal reward in areas of high poverty and/or unemployment.

### City size and economic base

Institutionalized community participation is not limited to low-capacity contexts, as exemplified by Oak Bay in Vancouver, which is a Campaign role model on the basis of its participatory approach to resilience building. The success of participation in small, low-density urban areas in high and low capacity contexts could be explained in part by the existence of a more personal connection between local government and the public, or because more rural livelihoods often mean that communities are more directly affected by the impact of relatively small-scale hazard events (such as damage to crops), and are therefore more motivated to take part. The main challenge for institutionalizing public participation in large cities is up-scaling, although much can be learned from the city of San Francisco (USA) – a highly developed and large city with 805,235 inhabitants – which has a well-embedded community participation programme (see box 4.4).



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Venice's rich cultural heritage, residents, and tourism industry, faces risks of flooding and sea level rise.

Smaller towns and cities may suffer from a lack of human capacity and financial resources, and, as a result, larger and more sophisticated hazard mitigating infrastructure (such as flood drainage, dams, coastal management) or early warning systems and forecasting technologies tend to appear more in larger, wealthier cities including Jakarta, Bangkok and Metro Manila. This is also driven by the high concentration of population and assets in large towns and cities, which necessitates hazard mitigation on a larger scale. High population density and size also means that emergency management is logistically more complex in large towns and cities, demanding particularly solid institutions for coordinated risk response. This explains the strong focus on institutionalization in many large cities, including Jakarta, Mumbai and Makati.

This is not always the case and many smaller municipalities have found ways of overcoming capacity challenges in order to introduce highly complex technological, institutional and structural risk management systems. Decentralization of disaster risk reduction resources from national to local government is a key mechanism for this, while many municipal governments have also made use of partnerships, including with NGOs and the private sector. Chacao, Venezuela, for example, has a modest resident population of 71,000, but a highly sophisticated warning system that includes wireless communications technology. Again, the public can also be a valuable resource to assist in forecasting and early warning, illustrated for example, in Ancona, Italy, where neighbourhoods have landslide monitoring equipment that feeds into real-time slope stability monitoring at the city scale.

In summary, many factors affect the types and effectiveness of resilience building activities cities undertake. A useful distinction is that between activities seeking to improve structural resilience (risk mitigation strategies that seek to resist the impact of hazards) as opposed to social resilience (activities which strengthen the coping capacity of communities). A combination of both approaches is necessary to reduce both exposure and vulnerability to disasters. To date, generally speaking, larger cities tend to focus more in institutionalization and mitigating infrastructure (focusing on structural resilience), while municipalities with less intense urban development have undertaken proportionally more social development and livelihood promotion activities (greater focus on social resilience). Cities' experiences also show that these associations cannot be assumed and there are many exceptions to the rule. Rather, resilience outcomes are shaped most strongly by the environmental and governance landscape of the city.

# CHAPTER 4: WHAT ARE LOCAL GOVERNMENTS DOING TO BUILD RESILIENCE?

Photo: UNISDR



As part of its resilience programme, the city of Mashhad is reconstructing and upgrading its inner centre using the highest seismic standards and innovative funding schemes from private and public sources.



## WHAT ARE LOCAL GOVERNMENTS DOING TO BUILD RESILIENCE?

This chapter presents many examples of resilience-building activities that cities and local governments are undertaking for each of the Ten Essentials for making cities resilient. It also points out gaps in areas that require further work to ensure more effective disaster risk reduction.



## 1. Institutional and administrative framework for risk reduction

**Essential 1:** Put in place organisation and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.

The Campaign and the Hyogo Framework for Action (HFA) emphasize the need for all city and town governments to have an institutional basis for implementing risk reduction that is multi-sectoral and involves all relevant stakeholders. Some Campaign cities have created municipal-level institutions to coordinate disaster risk and climate change, bringing together the functions and expertise of existing government departments to address hazard risks. In some countries, national frameworks and laws have helped create or strengthen municipal-level institutions. City governments are also engaging with a wide range of stakeholders beyond government departments, including multilateral and bilateral organisations, universities and research organisations that offer technical support, the private sector, NGOs and community organisations.

### *City and local-level institutional structures*

City and regional governments are creating councils, committees, authorities, agencies, and other local disaster risk management institutions. In some cities, the mandate of existing bodies has been expanded beyond the scope of emergency preparedness and response to include disaster risk, climate change and resilience. In doing so, cities have also brought together government departments from across sectors or regions to collaborate on risk reduction. The institutional frameworks also include defining responsibilities for each government department. In Bhubaneswar, the city government has expanded its focus on post-disaster response to include disaster risk management, setting up institutions at the city and ward level to address disaster risk<sup>6</sup>.

Strategies to institutionalise risk reduction and disaster management have been most effective where individuals or departments within local governments are legally responsible for implementation and coordination among all relevant departments or sectors. Cities in the Philippines have gone beyond a coordinating structure at the city level to institutionalise a community-scale structure for disaster risk management. In Makati City, a Barangay Disaster Risk Reduction and Management Committee acts as the implementing arm at community level of the Makati City Disaster Risk Reduction and Management Council; a similar structure is in place in Quezon City. San Francisco, Cebu has effectively empowered a dormant Purok structure for community development and disaster risk management (Puroks are one level below the Barangays and form the lowest level of informal governance [see Box 3.1]). In Albay Province, a key practice for improving risk reduction was the redefining of functional roles and responsibilities of different institutions and task units. The Province has had a central coordinating office for disaster preparedness, response and recovery since 1994. This has now been joined with a technical secretariat to create the Albay Province Safety and Emergency Management Office (APSEMO), which has initiated many innovative approaches to tackling disaster risk and climate change.

6. This has included a constitution for a ward-level disaster management committee, the formation of a disaster management team and preparation of the city disaster management plan. Forty-seven wards have prepared such plans [14, 16, 32]

Part of institution building at the city level is about clarifying the responsibilities of each government department for risk reduction. In Dubai, part of the process of creating an emergency management system was to identify the responsibilities and tasks of departmental emergency teams and develop measurements to assess each department's readiness to respond [28].

### ***Local institutions enabling cross-sectoral collaboration at the city-level***

Most disaster risk reduction institutions seek to bring together government departments from across sectors as well as multiple stakeholders. In Barcelona, a citywide Resilience Board encompasses 37 institutions, including many partly private utility companies and regional government representatives, to manage coordinated and collective responses. Dubai's crisis and disaster management team includes representatives from the roads and transport authority, health authority, ambulance services, the Dubai Municipality Corporate Emergency Management Team, civil defence, and the electricity and water authorities [28]. Examples of cross-sectoral collaboration are related to specific disaster risks and collaboration in emergency situations and most examples address flooding<sup>7</sup>.

### ***National-level frameworks enabling city-level institutions***

In some countries, national disaster risk reduction legislation has enabled the development of city-level institutional structures. This is particularly true when the legislation has clarified responsibilities, strengthened capacities to manage disaster risk and provided a supportive funding structure. The Hyogo Framework for Action states that designating responsibilities at the national level through to the local level, to facilitate coordination across sectors, is part of the institutional basis for implementing risk reduction [Priority Action 1].

The Philippines National Disaster Risk Reduction and Management Act of 2010 clearly defines roles for cities and municipal governments<sup>8</sup>. South Africa's 2002 Disaster Management Act includes proactive risk reduction as one of its central pillars and requires all levels of government to address risk reduction<sup>9</sup>. In Makassar, the city-level institutional structure has been improved through National Act No. 24 of 2007 on disaster management, which supported the development of a cross-sector institution and greater engagement with civil society [38]. Sri Lanka's Disaster Management Centre is a national platform that supports and coordinates municipal and city council work on disaster management. Committees at district, divisional and village level organise training and awareness programmes, drills, safety locations and routes, early warning, search and rescue training and livelihood support [63].

### ***Regional partnerships***

Some cities form regional partnerships to bring together local or provincial governments to address specific risks across a geographical region, such as flooding along a river system or coast line. Quezon City is part of the Alliance of Seven Cities/Municipalities that works to reduce the impact of flooding. In Indonesia, the Jakarta Regional Government has helped form a coordinating board for the region's rivers and watercourses. It is not always easy to establish regional partnerships for flood risk reduction and watershed management, especially where reducing flood risk in one area requires action by other jurisdictions – and where it is not clear—within government—where the responsibility for watershed management lies.

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7. For instance, in Colombo, Sri Lanka, the Ministry of Defence has created a task force consisting of all organisations with responsibility for flood mitigation [17]. In Pune, the flood risk reduction initiative is jointly driven by the elected municipal government, the Municipal Commissioner, many city departments, and active citizen groups called Alert [39].

8. The Act specifies that the Local Disaster Risk Management Office shall be under the office of the governor, city or municipal mayor and the duties of the office will span the spectrum of disaster risk activities, including monitoring hazards, creating risk management plans, communicating risks, engaging in hazard mitigation activities, and coordinating with stakeholders.

9. This provides the structure for integrating disaster risk management—from the local to the national level—and mechanisms for integrating multiple stakeholders into all disaster management efforts [33]. An advisory forum to the national government includes representatives from local government and local disaster management offices, providing local representation in national-level risk reduction planning.

### **Multiple stakeholder participation**

In the course of their disaster risk reduction activities, Campaign cities are engaging with a wide range of stakeholders through committees and forums on planning and use of participatory tools. For example, all stakeholders in Cape Town provide input during the drafting of integrated risk specific disaster risk management plans [33]<sup>10</sup>.

Municipalities that are developing project partnerships with outside organisations draw upon a wide range of skills and resources to implement risk reduction activities. For example, in Overstrand, a partnership between national, provincial, local governments and conservation NGOs, community-based organisations and water agencies is addressing drought risk through the ‘Working for Water’ programme, which includes managing water demand and clearing alien plant species (see Box 4.10) [21]. In Albay Province, local government draws on a range of expertise from research groups and universities to support its work.

A voluntary partnership created in Batticaloa, consisting of the Mayor, local government, local, national and international organisations, local civil society groups, academia and expert organisations, has enabled the city government’s disaster committee to draw on the expertise of all these actors to prepare the city’s development plan [63]. Batticaloa’s municipal council and district disaster management office are also collaborating with local and international NGOs to provide finance, training, livelihood development, water and sanitation. In Makassar, NGOs are involved in community development and good governance projects as well as the city’s ‘Makassar Green and Clean’ campaign that is supported by Peduli Negeri Foundation (a local NGO linked to the grassroots women network GROOTS—see Box 4.3). In Makati, the relocation of squatters from high-risk areas has been carried out in partnership with Gawad Kalinga (GK).

#### **Box 4.1: Building resilience through partnerships, in Cape Town, South Africa**

Two examples of resilience-building partnerships are Climate Smart Cape Town (a partnership between private, public and faith-based organisations whose task is to discuss climate change issues and contribute to city and provincial government adaptation plans) and an alliance between the Department of Arts and Culture, the NGO Artscape and the Disaster Risk Management Centre (DRMC), which resulted in a school-run youth theatre programme. Activities related to Essentials 5, 7, and 8 have also been combined through the YES (Youth Environmental School) Programme that promotes hazard preparedness as part of a wider environmental awareness programme that also covers recycling and sustainable energy use.

Another example is the city’s upgrading programme, which began in 2009 with five pilot projects. Since the establishment of a democratic government in South Africa in 1994, national and local governments have sought to address the legacy of apartheid that included a lack of critical risk reduction in infrastructure, particularly in previously non white areas and informal settlements. In line with national policy, the project recognises that poorer sectors of society experience disproportionate risk, and thus focuses on improving living and safety conditions in densely populated informal settlements. The project involves partnering with communities who create steering committees to identify community assets and challenges. These committees survey an average of 10 per cent of the community and the results feed into a Community Action Plan to improve basic infrastructure, expand roadways to allow access for emergency vehicles, and improve access to water and sanitation. They have also constructed educational day care centres for children, run in conjunction with the Department of Education.

These examples illustrate the value of cross-sector and cross-scale partnerships in building resilience. They also highlight the potential of a mainstreamed approach to risk reduction in addressing multiple challenges simultaneously, and the importance of government leadership in facilitating relationships between stakeholders.

10. See Box 4.1 on using partnerships to build resilience in Cape Town.

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**“ Disseminating disaster risk information at a level that is meaningful for local leaders is one of the Campaign’s greatest successes to date. The way to win support from other companies is to strengthen the business case for disaster risk reduction, with numbers to quantify the benefit. The Campaign is heading in this direction. It is very action-oriented, setting concrete goals and going step by step. The private sector loves this. The impetus for Cisco was the increasingly important role of networking technology in building resilient environments. ”**

Peter Gruetter, Director and Distinguished Fellow, CISCO Internet Business Solutions Group.

Some city governments have forged partnerships with academic institutions. These include the Makati City partnership with the Philippine Institute of Volcanology and Seismology and Kyoto University. Batticaloa is part of local government partnership with the University of Salford, which has contributed to hazard research, city planning, networking and awareness raising. An example is the 2011 International Conference on Building Resilience, which coincided with the national launch of Campaign in Sri Lanka [63]. The city of San Francisco (USA) has also recognised the major contribution of three large universities in a partnership that brings together the city’s Neighbourhood Empowerment Network (NEN), San Francisco State University’s Institute for Civic and Community Engagement (ICCE), the University of San Francisco (USF), and the University of California (UCSF) to address critical issues defined by local residents.

Many cities also report partnerships with Red Cross or Red Crescent Societies that go beyond their traditional role of disaster response at the national level. In some municipalities, these societies have taken an active role in local government disaster risk reduction committees and are partnering with local governments on training and awareness campaigns. Makassar’s Education Department initiated a school disaster preparedness campaign in partnership with Indonesian Red Cross [38]. The Rizal chapter of the Makati Branch Philippine Red Cross has been training first responders at the Barangay-level to address mass casualty situations [31].

### ***Private sector engagement***

The role of the private sector is critical to disaster risk reduction, since they account for a majority of investment and productive activities in urban areas. The commitment by private contractors, and private enterprise in any sector, to adhere to local and national policies for risk reduction, safety and sustainability- and show leadership in doing so- can change the landscape. On the contrary it can also increase the risks. The specialized knowledge by private enterprises can offer local governments advice, expertise, and technical support. But getting the attention and support of business remains a challenge for many municipal governments. Ancona, Cape Town, Makassar, Narok, Kisumu, and Moshi all report low private sector engagement as one of the challenges they face.

This is partly because risk reduction has not been seen to produce short-term gains. Some private sector actors have also complained that governments tend to approach them about a specific project rather than

as a potential long-term partner. Local governments need to be able to present their 'business case' for investing in resilience when engaging with private companies.

Another barrier to building public-private sector partnerships may be a lack of communication. For instance, local governments may be unaware that most large companies are undertaking some form of resilience-building activity (including insurance and contingency plans), which could benefit local level risk reduction plans and activities.

Many cities, though, are forging successful relationships with business. Cape Town, Makassar and Makati report the use of corporate social responsibility funds from private companies for risk reduction and post-disaster recovery. Chacao, Venezuela recognises the private sector as a key stakeholder for resilience building and has a risk management network of 33 companies, which are encouraged to prioritise self-protection, take ownership of the risks they face and take action (55). In Siquirres, Cape Town, and San Francisco, Cebu, the private sector has volunteered expertise or donated materials for disaster risk reduction initiatives. The Province of Tyrol has established a risk management system through a partnership with the alpS Centre for Climate Change Adaptation Technologies. This allowed an area-wide risk assessment to be carried out with direct links between this research centre and the risk management process. AlpS also provides support to municipalities for their local disaster risk reduction activities and connects them to relevant national and international partners (64).

#### **Box 4.2: The private sector's role in disaster risk reduction**

As the primary generator of wealth and the main employer in most cities, small and medium enterprise and other private sector should be at the centre of the urban disaster risk reduction agenda.

As cities grow, so too does the economic imperative for business to address disaster risk. Earthquakes, floods, drought and other events can severely disrupt the critical systems, distribution networks and infrastructure that are vital to a company's operations, and which can cause significant, long-term financial and reputational impacts. Large-scale events can also interfere with shorter-term market dynamics, artificially depressing or inflating stock prices. On average, large businesses with robust risk management programmes realise catastrophe losses that are seven times less costly than those companies with immature risk programmes —an average of US\$478,000 per loss compared with US\$3.4 million<sup>11</sup>.

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11. Dr Deborah Pretty, Oxford Metrica Risk Financing Strategies: The Impact on Shareholder Value for FM Global

But avoided losses only tell part of the story. Increasingly, the private sector views disaster risk reduction as a business opportunity. In many countries, private enterprise is the dominant vehicle for innovation and investment. It also has the expertise, resources, and capacity to develop innovative solutions to reduce the impacts of natural hazards. Through the ISDR Private Sector Advisory Group, and the associated learning and networking events facilitated by the Campaign, this technological and intellectual capital is starting to filter through to local governments, providing mutual benefits to both public and private sectors.

The motivation for private sector engagement in disaster risk activities relies on concrete evidence that these actions have a positive, quantifiable impact. Tools that enable cities to document their actions and show progress over time can help local governments build sustainable business partnerships.

### ***Role of communities and households***

Municipalities are also placing emphasis on the role of communities and households as partners in risk reduction. Communities are involved in different types of activities: a) participating in decision making with municipalities, through planning and policy making; b) generating information about risk and communicating risk; and c) taking direct responsibility for disaster risk reduction activities, a form of co-production that reduces the demands on municipal governments.

### **Box 4.3: Grassroots women and communities help shape risk reduction agenda**

Huariou Commission and GROOTS International aim to demonstrate the vital role of grassroots women and their communities in shaping the agenda of disaster-resilient development. Much of their work focuses on protecting people living and working in poor communities who are the most affected by disasters and the impact of climate change. The Campaign supports their efforts to expand understanding of and participation in programmes aimed at building the resilience of vulnerable communities. An example of this is the recent learning exchange that GROOTS facilitated between local leaders in Cantarranas, Honduras and Livingstone, Guatemala, which was followed by a major gathering of Central American local governments in Guatemala. Plans are underway to replicate this programme in other districts. In line with Campaign objectives, GROOTS also supports efforts to raise awareness of disaster risk at community level and raise the profile of the role of local leaders at national level.

Several cities report on the involvement of communities in planning and policy-making related to risk reduction or, more broadly, to urban development. Under Santa Tecla's ten-year development plan, roundtables allowed citizens to take part in discussions and decision-making about the future of the city. Following two devastating earthquakes in 2001, the involvement of citizen groups was a critical part of disaster risk reduction. The residents of Barangay Rizal in Makati City are also engaged in the planning process [39]. The 25-year Thimphu Structure Plan (2002-2027) involved many public consultations.

Municipalities are also engaging with communities to address the lack of basic data about risk, especially in informal settlements. In Albay Province and many cities in the Philippines, communities take part in risk mapping and communicate their findings to the municipalities. Albay Province has a community-based early warning system and community-based communication protocols and evacuation procedures. The Makati Risk Sensitive Urban Redevelopment Planning Project involves residents of Barangay Rizal in gathering baseline community risk and vulnerability information [see Chapter 1, Box 1.5]. A risk assessment in Tyrol, Austria combined expert input with community consultations involving 2,000 people in all 279 municipalities [64]. In North Vancouver, 'risk tolerance criteria' (a community's tolerable level of risk) for landslides and forest fires were developed by a natural hazards task force comprised of eight volunteer district residents who drew on experts and public consultations. They also made recommendations to the

city council regarding risk tolerance and risk reduction priorities [1, 41]. Albay Province has a community-based early warning system and community-based communication protocols and evacuation procedures. In Bhubaneswar, the municipality has trained residents as volunteers in search and rescue, first aid, relief management, water and sanitation, damage assessment, debris management [14, 9].

Some municipalities are trying to share the burden of risk reduction by encouraging households to do their part. For example, to reduce the burden on the municipality of flood preparedness, communities in Moshi are encouraged to clear drains in front of their houses each week. Households are also encouraged to store food and crops for use during drought periods [40]. San Francisco, Cebu has demonstrated innovative ways of engaging the public and decentralising governance to deal disaster risk, social vulnerability and environmental sustainability in a mutually reinforcing way (see Box 3.1).

### Box 4.4: Building resilience in San Francisco, USA

San Francisco, California [USA] is exposed to high seismic risk as well as potential risk from tsunamis, drought, landslides and flooding. The city is recognised as a leader in sustainability, having been named the greenest city in North America by Siemens Green City Index in 2011. It has also made great progress in building its resilience. The strength of the city's resilience is largely the product of its comprehensive institutionalization of disaster risk reduction and the participation of a wide range of actors in its various programmes, committees and activities. The City and County of San Francisco [CCSF] assigns a budget for disaster risk reduction that includes staff and projects. Funding is provided for free disaster response training for interested citizens; free assistance for business continuity planning is offered to non-profit organisations to help improve preparedness of low-capacity stakeholders.

The agency with overall responsibility for disaster preparedness, mitigation and response is the Department of Emergency Management (DEM), whose many responsibilities include resource and financial allocation, public awareness, city-wide hazard plans, coordinating training for city departments and external agencies/partners, and activating the Emergency Operations Centre (EOC) in emergencies. It also runs a large number of subsidiary programmes, including:

- **Disaster Preparedness Coordinators:** CCSF requires each department to have a coordinator; all meet regularly to share information and develop action plans.
- **Disaster Council:** Chaired by the Mayor, the Disaster Council is composed of CCSF department heads, city officials and private sector representatives; meets quarterly to share information and ensure stakeholder participation in emergency planning.
- **Lifelines Council:** A public-private partnership with major utility companies to improve infrastructural strength and reliability in case of a hazard event by understanding mutual roles and capacities and plan according to these.
- **Ten Year Capital Plan:** Annually, the CCSF adopts a ten-year capital expenditure schedule for publicly owned services and infrastructure. The plan is intended to connect all city stakeholders from a unified perspective, and makes recommendations to the Mayor.

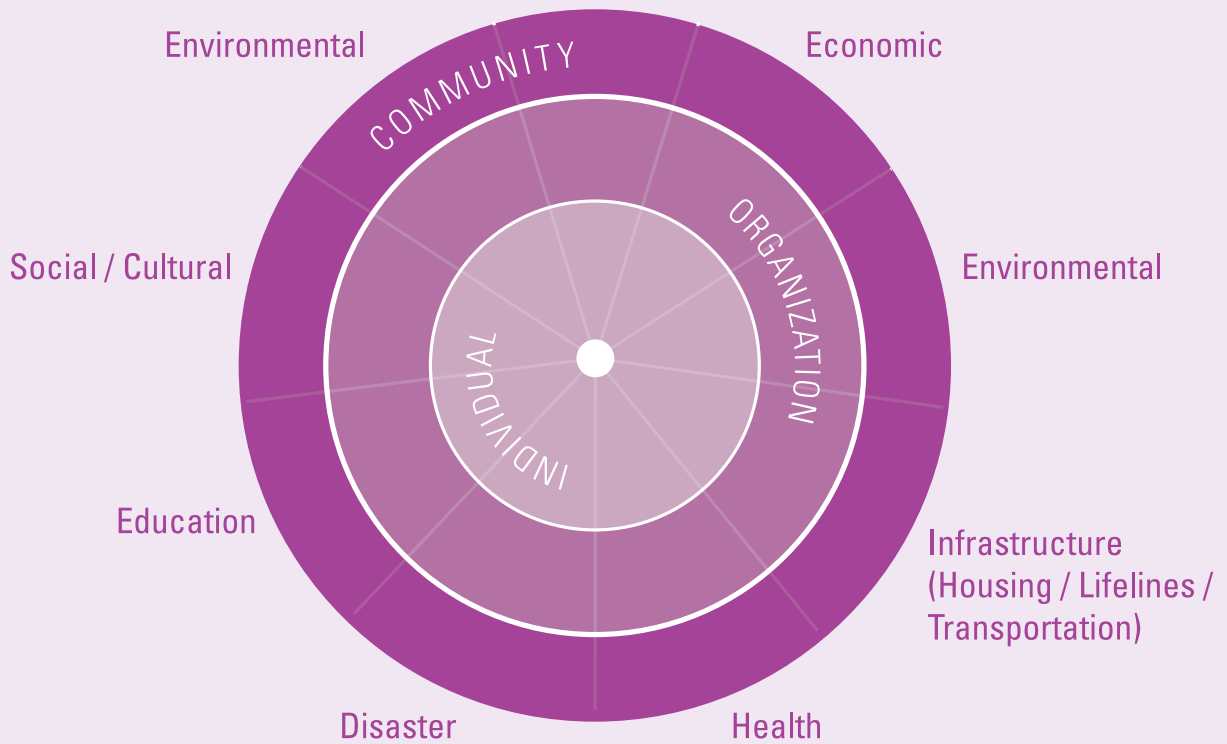
One of the most innovative programmes initiated by the DEM is the Neighbourhood Empowerment Network (NEN). The goal of the NEN is twofold: to source information from the public about their needs and priorities so that disaster risk reduction activities are appropriately attuned to these, and to empower residents

so they have the will and capacity to participate in making their communities more resilient. The NEN works through building coalitions of residents and community organisations, NGOs, universities, private and public agencies.

The 'Resilience Wheel' is a conceptual framework that informs San Francisco's disaster risk reduction strategy. It is based on the idea of 'layered resilience,' whereby actions at the individual level feed up to the community, organisational and city scale. The framework is used in stakeholder and community training to illustrate the importance of cohesive and complementary activities between all actors and across scales. It is intended as a 'roadmap' for current and future generations, to ensure continuity and sustainability over time.

## The Resilience Wheel - San Francisco, California

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## 2. Financing and Resources for Risk Reduction

**Essential 2:** Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and the public sector to invest in reducing the risks they face.

Many Campaign cities report that they have a specific budget for risk reduction at the city level. In some nations, this has been mandated by national policies. Some city-level budget allocations are an element of existing development or environmental projects that also help to reduce disaster risks, such as upgrading informal settlements or installing or improving drains. Where possible, cities are also drawing on a wide range of other financing, such as partnerships with NGOs, the private sector and technical assistance from bilateral and multilateral organisations. There are a few examples of incentive structures, whereby communities or other stakeholders are encouraged to engage in disaster risk reduction activities.

While there are many innovative methods for financing, most cities report that funding for risk reduction initiatives is still insufficient, especially cities that are at the early stages of resilience building, such as Kampala and Kisumu. Funds for disaster response, either at national or local level, are more common than funds for disaster risk reduction. Cities such as Ancona emphasise that they are seeking to expand funding for risk reduction at the city level, but that national level policies are also needed.

### *Municipal budget for disaster risk reduction*

With regard to municipal budgets for resilience initiatives, there appears to be two main routes. The first is to have a distinct budget for disaster risk reduction and recovery, channelled through a disaster management agency. For example, one of Beirut's first activities after signing on to the Campaign was to allocate a special budget for disaster risk reduction [41]. Similarly, Cairns has an annual operating budget to cover its Disaster Management Unit, Coordination Centre, volunteer emergency services, and community awareness programmes [41].

The second route is to integrate disaster risk reduction across the budgets and projects of existing municipal departments. In Quito, each entity within the municipality allocates some of its budget for risk reduction [35]. In Cape Town, financial support for risk reduction projects form an element of existing development or environmental projects.

Some cities have both types of budgets: a direct budget for disaster risk reduction and funding through municipal projects and programmes. For example, in the past, risk reduction budgets in Makassar were included in municipal development projects, such as upgrading of informal settlements and improving water supply and disaster response activities (see more under Essential 4 in this chapter) [19]. Since the establishment of the Disaster Management Agency (BPBD), there is now a specific budget allocation for activities such as improvement of disaster mapping, training on disaster risk mitigation, preparedness, reduction, management, development and operations of the Emergency Response Unit, and procurement and distribution of relief supplies when required [38]. Another example is Sri Lanka's national government Disaster Management Ministry, which supports flood control in the capital city of Colombo and a town planning programme, while Colombo's Municipal Council has created a disaster fund within the annual budget to provide relief services to people affected by disasters [17].

In some instances, national governments have enhanced the cities' risk reduction capacity (see Box 4.5 on financing resilience in the Philippines), while in others (such as Barcelona), the national government has no budget or legal requirements for disaster risk reduction and funding has come out of the local government budget.

### **Box 4.5: Financing resilience in the Philippines**

In 2010 the government passed the National Disaster Risk Reduction and Management Act (NDRRMA), adopting a proactive approach on the part of the national and local government and institutional mechanisms for risk governance. It dictates that the local government must allocate 5 per cent of total revenue to disaster risk reduction, 30 per cent of which may be spent on response and 70 per cent for preparedness. Local governments may also use 20 per cent of the Internal Revenue Allotment (IRA) from national government.

This strong national framework provides a supportive environment for resilience building, first by helping cities to overcome the significant and frequent challenge of funding. It means that disaster risk reduction activities are not restricted by the availability of 'leftover' funds in other department budgets, or subject to the ability to integrate disaster risk reduction objectives into existing projects. Furthermore, national and local government legislation assists local governments by legitimising resilience-building activities, helping to build political will, attract the interest of private and public partners, and promote buy-in at community level. Due to lack of capacity or knowledge to formulate disaster risk reduction plans and actions, many local governments apply these funds only to relief activities.

### ***Budgets for disaster relief***

Funds for disaster relief are more common than those for disaster risk reduction. Most relief funds come from the national level, but many cities also have financial arrangement for providing relief funds. In South Africa, the Disaster Risk Management Act and the Social Assistance Act created a framework that provides post-disaster funding when a disaster is declared. Cape Town has always managed with these funds, but it is an area of concern because a national disaster event must be declared to access them. The Municipal Finance Management Act (MFMA) stipulates that no contingency funds are allowed at city level, although discussions are underway to see if there is a way to address this. In Makati City, people have access to several types of loans in disaster situations, including the Makati City Employees Cooperative, which provides emergency loans for calamities, hospitalisation, death of family members, etc. In Thimphu, the King can award grants to the most disaster-affected families.

### ***Other sources of funding***

Cities are also drawing on sources other than government budgets to finance risk reduction initiatives. The most common source of external financing is partnerships with international NGOs, who are supporting a wide variety of risk reduction and climate change adaptation initiatives; the Mayor of San Francisco, Cebu has noted the significant support of the NGO Plan International to an island-wide climate and disaster risk reduction programme. In Makassar, several NGOs are engaged in a wide range of community development, good governance and green projects, greatly expanding the city's capacity for disaster risk reduction linked to development. Only minimal direct funding for disaster risk reduction is channelled through the local government in Kisumu. One example, however, is a JICA-funded project to build evacuation centres in three schools.

As mentioned under Essential 1, technical assistance is another common way cities are drawing on external resources to fund resilience-related activities. Much of this is directed at disaster management, urban risk and community-level plans. Many projects involve technical assistance from several partners. For example, the Makati Risk Sensitive Urban Redevelopment Planning Project had technical input from Philippines Institute of Volcanology and Seismology and the Earthquake and Megacities Initiative (EMI) and

received funding from the German Government's Federal Foreign Office. EMI is collaborating on disaster risk management planning in several other Campaign cities, including Mumbai.

There are a few examples from Campaign cities of private sector contributions. In Siquirres, private companies donated construction materials so the city could make engineering improvements, while citizens contributed their labour for construction. In Cape Town, a private engineering firm helped with risk assessment for 60 hazards, and in San Francisco, Cebu, the private sector has donated funds for the 'two million trees' project [see more on the Role of the Private Sector on p 43]

Cities with large deficits in their institutions, infrastructure and services that are central to disaster risk reduction will continue to struggle to address issues of funding, but as the previous examples show, much can be achieved when key public agencies take an active role.



### 3. Multi-Hazard Risk Assessment - Know your Risk

**Essential 3:** Maintain up-to-date data on hazards and vulnerabilities prepare risk assessments and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for your city's resilience are readily available to the public and fully discussed with them.

When urban centres address disaster risk reduction, they are, at the same time, building a stronger information base to support and direct risk reduction activities – including drawing on the knowledge of residents and community organisations, as well as the scientific community.

Many cities report that the limited availability of data on hazards, vulnerabilities and risks is holding them back from implementing risk reduction. Two UNISDR Global Assessment Reports in 2009 and 2011 highlight how compiling detailed local records of disasters both increases and changes the government's understanding of hazard and risk – and also provides a much stronger base for disaster risk reduction [75, 76].

#### *Risk and hazard assessment*

Many cities have undertaken some form of hazard and vulnerability assessment and created risk maps, often using Geographic Information Systems (GIS), to inform policy and planning. These assessments usually relate to different hazards and use different methodologies – as illustrated by the risk mapping and risk profiling undertaken by Albay Province and Makati. Cape Town and Johannesburg have completed disaster risk assessments [see Box 4.5]. In Quito, the municipal government has conducted several vulnerability and risk assessments, but notes a need for more regularity to reflect constantly changing conditions [35].

Other cities are drawing on their residents' knowledge of risks and vulnerabilities. Community consultations often reveal a considerable level of detail in the risks and vulnerabilities they face. In Bhubaneswar, community risk assessment is institutionalised at the ward level [14], including training of volunteers from NGOs on mapping exercises [32]. In Quezon City, the 'Walk the Fault' project, conducted with community leaders and members, identifies the actual path of the earthquake fault line that passes through the city [29]. In Cuttack, India, the Mahila Milan/National Slum Dwellers Federation uses GIS to map each informal settlement, document the number of inhabitants, record infrastructure and the provision of services, and report on the primary environmental challenges, including detailed information on flooding: when it happens and who is affected [88].

In Albay Province maps hazards from typhoons, earthquakes, volcanoes, tsunamis, floods, landslides and mudflows (lahar) as well as vulnerable populations and existing land uses. Makati City has conducted risk profiling for earthquakes, floods, soil liquefaction and landslides.

Cities responding to threats from climate change have spurred the development of more comprehensive risk assessments. Cape Town and Johannesburg are good examples of this [see Box 4.6].

### ***Knowledge feeding into policy***

In Johannesburg, the vulnerability and risk assessment feeds into disaster and adaptation planning, including the Comprehensive Disaster Management Plan. In Cape Town, the Comprehensive Disaster Risk Assessment (DRA) informs the feeds into strategic planning process [see Box 4.6]. In San Francisco, Cebu, the 2008 assessments of hazards, vulnerability, capacities and climate risk, conducted by the municipality, became the basis of the priorities and projects implemented in the municipality there.

Comprehensive mapping of flood risks in watershed areas is leading to more focused attention on structural and non-structural flood hazard mitigation. In Pune, the municipality analysed the hourly rainfall intensity and examined its likely impact on low-lying areas where natural drainage was blocked by the construction of houses or roads. This information was used to prepare flood risk maps that include details of the city's drainage. The maps have been used to prioritise structural and planning measures such as stream widening and bridge extensions [39].

## **Box 4.6: Collecting and applying risk information in Cape Town and Johannesburg**

The cities of Cape Town and Johannesburg have conducted extensive risk assessments, and knowledge from these has fed into policy. This is a result of the close and productive relationship between the scientific and policy-making communities.

At an early stage of resilience building, Cape Town's local government conducted a citywide Comprehensive Disaster Risk Assessment (DRA), which included: a) scientific hazard and vulnerability analysis and b) community-based risk assessment to ensure development initiatives and disaster planning are informed by accurate, locally-based knowledge. The DRA identified priority risk areas, which in turn, helped to focus research and policy-making in areas that would have the greatest potential impact. Climate change risks in the DRA are addressed in the city's Climate Adaptation Plan of Action, currently being developed. This contains sector-specific adaptation plans that ideally will be embedded citywide to increase Cape Town's overall resilience.

Cape Town also analysed local rainfall and climate change projections, which led to a 15 per cent budget increase for use in planning storm water systems and for flood management plans. In addition, the Climate Change Think Tank initiated in-depth risk assessment and modelling of a major catchment area, seeking to understand the flood risk under a range of climate change scenarios. This will be repeated for all other significant catchments. The results will feed into catchment management plans, the infrastructure investment strategy, and will inform approval of the city's building plan. A final example is a bylaw now being developed to enforce a moratorium on development in high-risk coastal areas, following a study of the anticipated rise in sea levels.

Similarly, Johannesburg's Disaster and Adaptation Plan [built on the 2008 Climate Change Vulnerability Assessment, which helped to identify priorities for medium and long-term research within and across sectors] is integrated into the city's Comprehensive Disaster Management Plan. This process has thus contributed to knowledge building, policy development, and iterative adaptation informed by on-going research.

The development of these disaster risk and climate adaptation plans, informed by scientific research, are highly important in terms of enabling cities to implement risk reduction and adaptation activities that are locally-relevant and in line with the latest risk knowledge [18].



## 4. Infrastructure Protection, Upgrading and Resilience

**Essential 4:** Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.

Many municipalities are addressing flood risk through infrastructure and engineering projects. Albay Province and Makati City; Colombo; Mumbai; Bangkok; Cairns; Venice; Santa Fe, Argentina; Thimphu; and Kisumu all report activities to improve the capacity of drains and control of flood waters. In Siquirres, the municipality has invested in small-scale yet high-impact interventions—concrete reinforcement of the creek embankment to prevent flooding of nearby houses and expansion of underground water pipes to avoid overflow along roads. This has greatly reduced the impact of annual flooding and was completed with a small budget using resources from private sector and communities (see more in Box 1.1). Santa Fe, Argentina, has introduced water-pumping technology to improve city drainage and help to mitigate flooding [54].

In an effort to become more resilient to intense rainfall events, such as the July 2005 storm where the equivalent almost 35 per cent of annual rainfall occurred in one single day, Mumbai has developed a large-scale multi-action programme to tackle flood risks. This includes infrastructure investment in a storm water drainage system, widening and deepening existing water channels and causeways, rehabilitation of old drains especially in the Island City, providing smooth transition for waterways near bridges, the installation of nine storm water pumping systems and 196 discharge pumps, as well as portable dewatering pumps for use at flooded spots. There are also major annual investments in de-silting of the system. (See Box 3.2 on Venice for another example.)

### Box 4.7: Bonn collaborates on climate adaptation, biodiversity and water quality.

Bonn, Germany was the first city to sign on to the Making Cities Resilient Campaign, when it launched in the city in May 2010. Since then, Bonn's Mayor Jürgen Nimptsch, says the city has made considerable progress in developing its network of partners, raising awareness of disaster risk in communities, and further engaging with national governments to recognise and support disaster risk reduction. The city is also participating in knowledge exchange programmes to share experiences, early warning, and disaster management approaches and solutions to natural hazards and climate change impacts.

Bonn is working with six project partner cities worldwide, including Bukhara (Uzbekistan), Chengdu (China); Cape Coast (Ghana), La Paz (Bolivia), Minsk (Belarus) and Ulaanbataar (Mongolia). These cities are also cooperating on climate adaptation, biodiversity and water quality projects.

Locally speaking, effects of climate change in Bonn—heat waves and heavy rains—have been minor. The city's primary challenge, disaster-wise, is flooding from the Rhine River. The municipality has a very strong role and responsibility—and a legal obligation—to mitigate and reduce flood risk. The Building Department is responsible for the technical aspects related to Rhine floods and heavy rains, while disaster management is in the hands of the fire department and cooperating national governmental organisations. Measures to upgrade flood-protection in Bonn-Beuel may serve as an example. In total, €6.5 million were invested to protect a 1,000-meter-long section of the river. The state government (North Rhine Westphalia) provided €3.6 million of these funds.



The City of Kobe, Japan, with 1.5 million inhabitants, suffered great losses during the Great Hanshin-Awaji Earthquake in January 1985 (7.2 Richter scale), disrupting the activities of one of the busiest ports in the region. The recovery focused on creating a safer city, where complex infrastructure and service systems are balanced with human interaction, education and community cooperation.

Other types of engineering solutions for increasing resilience include actions to reduce wind damage, construction of cyclone shelters, and installation of fire hydrants. In Colombo, a tree maintenance unit prunes and trims roadside trees to avoid wind damage [17]. In Moshi, fire hydrants have been installed around the city to cope with settlement fires. Many cities are investing in cyclone shelters. In Mumbai, four cyclone shelters (which can house approximately 3,000 disaster-affected persons) have been constructed with World Bank support. These are used as schools during normal times [25].

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**“Global environmental change is one of the main challenges every city has to cope with in order to secure the well-being, health and wealth of its citizens. As Vice Chair of the World Mayors Council on Climate Change, I am more than aware of the need for action.”**

Jürgen Nimptsch, Mayor of Bonn.

### *Upgrading or relocating informal settlements*

It is common in cities in low- and middle-income nations for 20–50 per cent of the population to live in informal settlements. The major challenges for resilience lie in developing the necessary basic infrastructure for water, sanitation and drainage, improving roads and supporting housing improvements. Upgrading makes low-income settlements and cities more resilient to a range of natural hazards, including flooding and fires. Some cities are addressing these issues through slum upgrading projects and programmes that aim to improve housing and infrastructure.

In Makassar, 42 urban slums have been upgraded, including the rehabilitation of 475 houses (financial support from local and national budgets) and the construction of rental housing. Mumbai’s Municipal Corporation rehabilitated 1,769 residential and 349 commercial structures and the state’s Slum Improvement Board built 288 retaining walls on 74 sites [24]. Kenya’s national Slum Upgrading Programme is undertaking a pilot programme to upgrade informal settlements in flood-prone communities. Moshi’s city council has partnered with the national government to initiate a small informal settlement-upgrading programme to improve roads and drainage systems and provide waste management [40].

In flood-prone areas, the removal of informal settlements and other unauthorised structures along waterways is sometimes seen as a proactive measure. Albay Province and Makati City have begun large-scale relocation programmes, in partnership with local NGOs. In Colombo, unauthorised structures on top of drains and encroachments into canals have been removed. In Kampala, the local government has sought to evict people encroaching on wetland areas. While in some situations the relocation of informal settlements along waterways may have the desired impact of preventing flooding, it often has a serious socio-economic impact on the communities being relocated [see more under Essential 6].



## 5. Protect Vital Facilities: Education and Health

**Essential 5:** Assess the safety of all schools and health facilities and upgrade these as necessary

The safety of schools and hospitals is a top priority for any resilient city. The 'One Million Safe Schools and Hospitals Campaign' sought to reinforce this concept by encouraging individuals, families, communities, organisations, governments, businesses and other entities to pledge to work for safer schools and hospitals ([www.safe-schools-hospitals.net](http://www.safe-schools-hospitals.net)). This is part of the Resilient Cities Campaign, and builds on the 2006-2007 Global Campaign on Safe Schools, and the 2008-2009 Global Campaign on Safe Hospitals. Many cities have committed to these principles and several Campaign cities report activities to enhance the construction safety of schools and hospitals to support their continued operation in the event of a disaster.

The WHO/PAHO Hospital Safety Index (a low-cost tool to assess the ability of health facilities to remain functioning in emergency situations) was promoted during the UNISDR One-million Safe Schools and Hospitals Initiative. In Makati City, the Hospital NG Makati applied the Index and the hospital has been assessed as 'generally safe,' meaning that it will not collapse, can continue to function in a disaster, and is well-organised with contingency plans and trained health personnel. Using customised 'safe hospitals' indicators, Barangay health centres have also been assessed as 'relatively safe.' [31]. Other cities that have made progress on safe schools and hospitals include Cape Town, Makassar, and Quito. In Cape Town, all 17 Environmental Health Offices and 18 of 80 clinics have achieved a quality assurance rating from South Africa's Council for Health Services Accreditation. All schools undergo mandatory safety inspections by the Health and Safety Committee [33]. Makassar has instituted school and hospital safety assessments, and the departments of Public Works, Education and Health are working on rehabilitating school and health facilities [38]. In Quito, the Municipality is conducting structural studies of schools and essential city buildings against seismic hazards. This used to be the responsibility of central government, but was decentralised in 2011. [35]



## 6. Urban Planning and Building Regulations

**Essential 6:** Apply and enforce realistic, risk compliant building regulations and land use planning principles. Identify safe land for low-income citizens and develop upgrading of informal settlements, wherever feasible.

The strategies under this Essential are central to reducing disaster risk, but some of the measures needed to do so are among the most difficult to implement. It is difficult for any city government to ensure that low-income households can buy, build or rent housing located on safe sites. Upgrading informal settlements has become the norm in many cities and this can be linked to disaster risk reduction. But it still remains politically controversial in many others. Integrating an in-depth understanding of disaster risk into urban plans and land-use management requires good inter-sectoral coordination as well as detailed local data on risks and a commitment to disaster risk reduction.

Several cities report that they have integrated hazard risk information into their urban planning processes. After an initial risk assessment in Bhubaneswar in 2003, the city updated its master plan and revisited its building bylaws to account for hazard risks [16]. Quito is developing risk-sensitive land use planning [22]. Makati City and Makassar<sup>12</sup> have updated their land use planning processes so that development in a hazard-prone or environmentally-sensitive area requires an environmental compliance certificate.

Urban plans and disaster risk management plans in Cairns are linked to codes that offer specific guidance to regulate development in areas prone to landslides, bushfires and flooding. [46]

Albay Province has supported 18 municipalities to prepare comprehensive land use plans that address climate and disaster risks and integrate these risks into provincial plans. This has been institutionalised through a special planning ordinance and an updated provincial Comprehensive Land Use Plan (CLUP) for disaster risk reduction and climate change adaptation and mitigation [45].

Colombo has taken several planning and development actions to minimize unplanned urban development, prevent unauthorized construction and discourage investments in areas that are environmentally sensitive and risk-prone [17].

In the SAMEN programme of Mashhad, Iran, a pilot risk reduction project is underway with support from the provincial government. Thirty sub-projects are addressing the Ten Essentials, including risk mapping, modelling earthquake scenarios, establishing emergency response teams, community-based disaster risk management and land use planning [61].

### ***Building codes and enforcement***

Several cities report that building codes take into account the risk of hazards. However, most cities report difficulties in enforcing and achieving compliance with the codes. Sometimes there is insufficient staff to enforce the codes; in other cases, legislation is weak. In Makassar, while building permits are intended to comply with building codes and environmental considerations, often they are issued without complete compliance. When the city applied the HFA local self-assessment tool, they noted that legislation must be strengthened. In Narok, Kisumu and Moshi, local councils have put codes and regulations in place, but all struggle to enforce them. [40].

Thimphu has strict design requirements for particular hazards: for earthquake risk; density and land coverage for landslide risk; and wind load standards for cyclone risk [42]. Although the city conducts annual inspections of buildings and facilities to review compliance with the national building code [31], it has reported difficulties arising from its limited expertise and capacity to monitor construction and from citizens who complain about higher construction costs associated with the need to comply with anti-seismic standards and regulations that limit buildings to 20 per cent of plot coverage [42].

Bhubaneswar has taken another approach to improve compliance with seismic building codes by focusing on training engineers, architects and planners (and in some cases, masons) to use Rapid Visual Screening (see more in Box 4.9) to assess the built environment's capacity to resist earthquakes and on earthquake engineering principles and multi-hazard construction technologies [32]. The city has also updated its building codes based on the recent risk assessments [16].

### ***Relocation***

Some cities have relocation programmes to move people living in precarious informal settlements to safer sites. In Guicadale in Albay Province, the disaster risk reduction strategy centres on relocating businesses

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12. This was prompted by the devastating landslides in 2004 and hazard, risk and vulnerability are now included in land use plans. All projects that may impact the natural environment, including natural hazards, must have an environmental impact assessment and must be granted an environmental compliance certificate before they can go ahead.



[new airport and road networks] and 10,076 households. San Francisco, Cebu reports on the removal and transfer of communities and structures in areas prone to storm surge [10]. Makati City's flood mitigation programme included relocation of informal settlements along waterways and in landslide-prone areas<sup>13</sup>.

A growing number of cities is engaging in relocation programmes to reduce disaster risk, but much more needs to be done to understand when this is needed and how it should be implemented. Relocation programme often impoverish those moved. For many low-income groups living on an at-risk site, the risks they face from relocation, including disruption to their livelihoods and social networks, may cancel out any benefits from moving to a safer location. Government relocation is often to sites not compatible with income-earning opportunities. Delays are often incurred in developing these sites with needed infrastructure and services. Unfortunately, city governments often give too little consideration to how settlement upgrading can reduce disaster risk and do away with the need for relocation. In Quito, only if an informal settlement is declared high risk and the city is unable to undertake risk reduction measures are resettlement programmes provided. [35]



## 7. Training, Education and Public Awareness

**Essential 7:** Ensure education programmes and training on disaster risk reduction are in place in schools and local communities.

Many cities include awareness raising as part of their disaster risk reduction strategies (i.e. enhancing disaster preparedness). This helps to ensure that individuals know what to do in an emergency situation and what measures they can individually and collectively take in advance to reduce risk to themselves, their families and their communities. Raising awareness includes formal training schemes and campaigns that target either a mass or specific audience. They may include simulation exercises and drills to reinforce messages. Some risk reduction messages (particularly those targeting the youth) can be delivered as part of broader environmental, arts, or personal development programmes. The academic sector is also implementing programmes in risk reduction and crisis management.

### *Community risk training programmes*

Many cities have held first responder training to enable communities to respond quickly to a hazard event. In Quezon City, public training includes rapid response and flood/water rescue, training on collapsed structures and basic life support. Training is held in schools, hospitals, shopping malls, hotels and community centres, and involves both the public and private sectors [29]. Community training has been offered in Albay Province on household and community preparedness and for first responders [5]. Several cities prioritised training for community leaders and volunteers, particularly those who are members of city or community-level disaster management committees or response teams, thus contributing to an effective decentralised disaster response. Members of Makati's Barangay Disaster Coordinating Councils have received training in disaster and emergency management and mass casualty management [31].

### *Trainings in schools*

Cities have also prioritised training in schools and colleges, usually on personal safety and emergency procedures. For example in Bhubaneswar, 3,000 students from 35 schools and 600 college students have been trained in disaster management planning and safety tips [32]. Local governments in Ecuador (as

13. Informal settlers have been given free housing and livelihood opportunities in partnership with Gawad Kalinga (GK), an NGO. The Makati city government acquired the land necessary for the resettlement.

well as the Mayor of Quito) are working on awareness programmes and training in disaster risk reduction, alongside other safety issues of violence and road safety. Quito's 'my school is prepared' programme includes training, contingency planning, and emergency drills [35]. Other cities have integrated disaster risk reduction into education on broader pro-environmental practices. For example, school programmes in Colombo teach solid waste handling to reduce flood risk [17], and Chacao has an 'EcoEscuelas' programme that addresses environment and risk issues [55]. Schools in some cities, such as Cairns and Saijo City, are integrating risk reduction into the school curriculum to ensure that all children are reached<sup>14</sup>.

### ***Overcoming lack of awareness of disaster risk reduction amongst professionals and decision-makers***

Mumbai, Bhubaneswar, Thimphu and cities in Pakistan identified the lack of knowledge about disaster risk reduction at all levels as a key challenge to building resilience. To address this, these cities (and others) offer training to core service professionals and local government workers. Bhubaneswar's Municipal Corporation has trained engineers, architects and planners in earthquake vulnerability and response in order to improve implementation of hazard-resistant building codes and increase the quality of hazard-proofing activities in new and existing structures. The city has also trained volunteers from NGOs working in disaster risk reduction on hazard mapping. A similar approach has been adopted in Batticaloa, where risk design and management are now part of the standard curriculum for planners, architects, and engineers.

### **Box 4.8: Palestinian university moves risk reduction agenda forward**

The An-Najah National University in Palestine held the first Palestinian Urban Forum, which brought together municipal representatives and local institutions to discuss issues related to safe cities and disaster risk reduction and review the basic elements necessary to make cities resilient to disasters.

The forum concluded by recognising the need to establish a Palestinian strategy for disaster risk reduction that encourages municipalities and local governments to join the 'Making Cities Resilient Campaign' and implement the Ten Essentials throughout their work.

The forum also emphasised the need to activate the High Council of Civil Defence; adopt a special fund for disasters at the national level; and provide training programmes on disaster reduction at all levels and sites [schools, universities and institutions].

UNISDR and partners have undertaken training sessions for councillors and local government officials in many cities – and local governments identify the Campaign's positive role in improving their awareness of disaster risk reduction principles at early stages of resilience building. UNISDR has also engaged parliamentarians on this issue, encouraging them to convene discussions on decentralising risk management capacity and legislative frameworks [see the example of Lebanon below; Bangladesh, Uganda, Benin are other examples]. This in turn has fed into greater political will to develop and enforce policies to reduce urban disaster risk. Ancona highlighted how their participation in the Campaign has increased awareness of disaster risk reduction amongst politicians, as well as providing access to technical information.

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14. In Saijo City, the value of regular school-based disaster risk reduction education is seen at the household level, when children home the information learned at school. Since 2006, risk awareness courses have been held three times a year as part of the '12-year-olds disaster prevention education' project. Educational field trips about risk – either 'mountain-watching' or 'town-watching' – help engage the children and help them to make associations between the classroom and 'real life.' [39, 48]

#### **Box 4.9: From national to local commitment for resilient cities in Lebanon**

The Disaster Risk Management Unit of the Presidency of Council of Ministers, coordinator for the National Platform for Disaster Risk Reduction (and supported by UNDP-Lebanon, and UNISDR), has embarked on a comprehensive disaster risk reduction programme. As part of this effort, they have embraced the Making Cities Resilient Campaign. Similar to countries such as Argentina, Iran, Philippines and Sweden, they are proactively motivating and assisting their municipalities and cities to join the Campaign and improve their capacity to deal with different disaster risks. This has been a gradual process in Lebanon. In a first high-level Campaign launch event in 2010, six municipalities joined – Beirut, Byblos, Saida, Tripoli, Tyre, and Baalbek. Several workshops were conducted with parliamentarians, private sector, government departments and city representatives to raise the awareness and knowledge of what can be done, including collaboration between Venice and Byblos, and several city representatives engaging in global and regional forums around the campaign. In 2011, 51 municipalities had signed on to the Campaign, and in 2012, the aim is to reach out to all.

To achieve this goal, the government conducted training of ‘trainers’ (officials of the Ministry of Interior, municipalities, unions and other stakeholders) on how to use the Campaign tools (2012). Cities from other countries came to share their experiences: from the Arab region (Amman, Aqaba, Petra) and other regions of the world such as San Francisco, USA and Amadora, Portugal. This contributes to the city-to-city learning and exchange good practices on urban risk reduction, including integrating and institutionalising disaster risk reduction in urban development plans and investments.

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**“We are a newly elected council; we are concerned about disaster risk reduction and so we registered as a Campaign City in October 2010. As a first step, the Council looked at allocating a budget to begin risk reduction activities: risk assessment, building a risk database, developing a DRR master plan, etc. We analyzed our needs and took stock of what was available and performed a gap analysis. We have several heritage sites within Beirut and protecting and preserving their character is important. We will move ahead using four pillars: technical support; financial support; involvement of the private sector and civil society; and national government support. If we do not allocate the right resources, we run the risk of not prioritising projects. Building resilience is not the responsibility of the mayor alone. Action must be taken at the following levels: national and provincial governments, city government politicians—whether elected or appointed; and the municipal administration.”**

Councilor Nada Yamout, Beirut, Lebanon.

## Mass awareness campaigns

Mass public awareness campaigns are encouraging changes in household-level behaviours toward risk reduction and ensuring that early warnings are acted upon. Some campaigns are conducted annually, such as cyclone awareness campaign in Cairns [46]. Other cities focus on a particular hazard facing the city. These include Bangkok's flooding campaign [43]; Cape Town's urban sustainability 'Smart Living Campaign' [33]; and Overstrand's water conservation awareness effort to reduce the risk of drought [21].

Many campaigns use a combination of print, audio, and online materials to disseminate information. Saijo City distributes hazard booklets to government bodies, public halls and libraries [48]; Makati airs a disaster risk reduction radio programme [31]; Makassar has a disaster risk management website [38]; and Bhubaneswar publishes a newsletter. Some cities also offer incentives to encourage public engagement in risk response. For example, the St John's Ambulance Service in Kisumu runs a local first aid competition that feeds into regional and national-level competitions [40].

Several cities use national or global disaster risk reduction events to heighten public engagement. For example, both South Africa and the Philippines celebrate World Disaster Reduction each year, while Nepal and Japan both observe the annual anniversary of a significant national disaster.

### Box 4.10: Public awareness and education in Bhubaneswar, India [Essentials 5, 7]

The city of Bhubaneswar began working on disaster risk reduction in 2003 with an urban risk assessment to identify priority risk areas. Early on they recognised the challenge of low-level public awareness of disaster risk reduction, which extended to staff in the disaster management department.

**Public awareness:** Extensive mass awareness campaigns and formal training courses have included training for doctors (mass casualty management); community health workers (first aid); engineers, architects and planners (earthquake vulnerability and rapid visual screening to identify the earthquake-resistant capacity of structures); masons (earthquake-resistant construction); and women from self-help groups (urban risk reduction). Training courses for volunteers have focused on emergency response, including search and rescue, first aid, relief management, water and sanitation, damage assessment, and debris management. Community risk assessments have been conducted to increase community engagement and awareness and capture ground-level information on risks.

**Trainings in schools:** Disaster preparedness and response has been introduced into the curriculum at primary, secondary and university level, including training teachers in school disaster management and planning, training school-based disaster management teams in search and rescue and first aid, preparation of school safety plans, and awareness activities for students. To date, 3,000 students have been educated in disaster risk management planning and safety tips, and a school safety programme has been implemented in 35 schools. Mock drills have been held at city, ward, and community levels as well as in schools and colleges, involving ODRAF, the State Fire Service, the National Disaster Response Force (NDRF) and community volunteers.

**Building political will through education – and through local champions among city workers, planners and engineers.** This has played a significant role in building political will, momentum and a culture of commitment to disaster risk reduction. Key to this has been the education of local government officials about urban risk management issues. Bhubaneswar was the first municipality in the state of Orissa to sign on to the Campaign in 2010, and its leadership position has been confirmed by the large number of municipalities who later signed up at a 2011 Campaign event, committing to amend construction bylaws, raise awareness and improve school and hospital safety.

### *Innovative use of arts and media*

Some cities have innovative strategies to increase awareness about disaster risk reduction by engaging youth in projects that simultaneously promote community cohesion and individual personal development.

In Cape Town, the Disaster Risk Management Centre set up a community-based educational theatre project, in partnership with the Department of Arts and Culture and the NGO Artscape [33]. A similar child-led theatre project was initiated in San Francisco, Cebu [10] that included public viewings of disaster risk reduction and climate change adaptation films.



## **8. Environmental Protection, including protecting ecosystems**

**Essential 8:** Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices

Progress in this Essential depends heavily on the core measures for implementing Essential 6, (Urban Planning and Building Regulations) as it requires the capacity to manage land use and protect ecosystem services. Some cities are integrating disaster risk reduction principles into programmes that focus on environmental sustainability, but this usually requires the city's environmental departments to recognise the importance of doing so. Generally, this is easier to do in cities where there is already a level of acceptance about wider sustainability principles including those linked to climate change.

### *Urban development and ecosystems*

The incorporation of disaster risk reduction into urban policy and practices is evident when principles of resilience and eco-sensitivity become part of citywide development plans. Thimphu has taken steps in this direction with its Structure Plan, which is based on principles of the human well being of current and future generations, eco-friendly approaches and risk reduction [42]. In South Africa, many cities that face a scarcity of water have taken measures to address this, such as Overstrand's 'Working for Water' scheme, through which they have cleared invasive alien plants to improve water security and promote biodiversity and land productivity, addressing risk reduction, environmental protection and human livelihoods simultaneously (see Box 4.10)

### *Sustainable living*

Many cities present disaster risk reduction to the public as part of more sustainable living. This is done through mass awareness campaigns that seek to alter individual and household-level behaviours in ways that improve overall community or city-level resilience and environmental quality. Several cities view sustainable livelihoods as an important component of a resilient society. San Francisco, Cebu has a sustainability programme to promote environmentally-friendly forms of income diversification to stimulate household incomes and increase resilience – including organic farming and backyard gardens, and community-based eco-tourism and livelihood initiatives [10]. The Centre for Initiatives on Research and Climate Action (CIRCA) in Albay Province also focuses on livelihoods, seeking to strengthen capacity for sustainable agriculture, forestry, fisheries, energy and eco-cultural tourism. Community participation in solid waste management is another common emphasis in city sustainability campaigns in Makati City, Makassar and Bangkok [43], which helps to reduce urban flood risk.

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**“Investments in disaster risk reduction and climate change adaptation can make Copenhageners healthier, protect biodiversity, improve quality of life, and make our city more economically resilient.”**

Ms. Ayfer Baykal, Copenhagen’s Mayor of  
Technical and Environmental Administration

### *Maintaining natural defences*

Essential 8 emphasises the importance of natural barriers in mitigating hazard impacts. Many Campaign cities are focusing on environmental management measures to reduce risk, including planting and rehabilitating mangroves for coastal protection (Albay Province and San Francisco, Cebu, and Makassar), reinforcing sand dunes (Cape Town), planting trees to reduce wind damage to schools (Kampala), ridding wetlands of encroaching species (Kampala), afforestation in Pune to reduce flood risk, and protecting slopes to reduce the risk of landslides (Quito). Ecologically sensitive construction involves using natural materials to build structures that are hazard resilient. For example, Pune has built earthen check dams in hilly areas to help conserve the watershed and reduce flood risk [39]. Another initiative in Saijo City constructed 22 dams from wood from thinned-out local forests and local rocks to prevent mudflows [48].

### **Box 4.11: Copenhagen implements Climate Plan after floods**

The Danish capital of Copenhagen implemented a sweeping climate change plan, backed by the national government, after the city was devastated by ‘a one in 1,000’ year flood in July 2011. The city’s Climate Plan is designed to limit the impacts of more severe weather and climate change. Among other points, the plan calls for a 20 per cent cut in carbon emissions by 2015, and a goal to be carbon neutral by 2025. Overall, Copenhagen estimates the Plan could deliver an estimated savings of €3 billion over the next 100 years in avoided economic losses related to future extreme flooding from the sea and rain. Over the next century, rainfall on the city is expected to increase by 30 per cent, with intense late summer precipitation increasing by as much as up to 50 per cent.

### **Box 4.12: Integrating environmental sustainability and disaster risk reduction in Overstrand, South Africa**

As part of addressing broader challenges of environmental sustainability and community development, the municipality of Overstrand has sought to increase its resilience. Water scarcity is the primary risk in Overstrand and the local government’s water demand management strategy includes a public awareness campaign, leak detection and repair, introducing restrictions on water use and development, and the ‘Working for Water’ project, in which disadvantaged groups are trained and employed to clear invasive alien plant species. This project seeks to promote biological biodiversity, increase water security, and offer livelihood opportunities. Within South Africa, Working for Water has cleared more than one million hectares of invasive alien species and provided jobs and training to approximately 30,000 women, young people and people with disabilities. The Overstrand water resource management programme is the product of a multi-stakeholder partnership among national and provincial water agencies, a regional biodiversity conservation institute, and a group of community-based organisations. Key to the success and longevity of this are cross-scale and multi-sector contributions and the local government’s role as facilitator.

### *Disaster risk reduction and climate change*

Few cities have an action programme to address climate change adaptation separately from disaster risk reduction. Some cities have set out the terms of a comprehensive adaptation strategy, but with limited detail on specific adaptation activities. Adaptation is mostly limited to education campaigns and symbols of political commitment to adaptation, as part of citywide climate change strategies, plans and pledges.

Many cities focus on climate change mitigation, which does little lower local risk, but does contribute to slowing down dangerous climate change at a global level. These mitigation measures focus on energy conservation (for example, use of more efficient lighting or promoting renewable energy options in Bangkok) and reducing greenhouse gases (for example, using rice hulls in place of fossil fuels in a cement factory in Albay Province), or planting trees in Bhubaneswar.

Adopting climate change action plans is a first step in most cities. Quito was among the first to formulate a climate change strategy with a schedule for compliance. Cape Town, Johannesburg and Durban are among the cities that have led the way in developing climate change adaptation strategies. Cairns adopted its Climate Change Adaptation Plan 2009, which included a qualitative risk assessment and recommendations for a range of appropriate responses [46]. Bangkok adopted a five-year 'Climate Change Action Plan in 2007, although the activities focused on mitigation [43]. Albay Province's Action on Climate Change (A2C2) programme includes education and awareness programmes [the links between disaster risk reduction and climate change adaptation are emphasised in school disaster risk reduction education and teachers are trained so they can pass information on to their students, sector-specific climate smart programmes for health, housing, water sanitation and hygiene, and resilient livelihoods].



## 9. Effective Preparedness, Early Warning and Response

**Essential 9:** Install early warning systems and emergency management capacities in your city and hold regular public preparedness drills

There is wide recognition among cities that emergency preparedness, early warning systems and disaster response structures are vital for reducing the number of deaths and injuries caused by rapid-onset disasters. Most cities have taken some action in this area. Some have sophisticated, integrated monitoring and warning systems, with teams of professional and volunteer personnel trained in emergency response and with effective measures to reach the public with early warnings. Others have a more basic level of preparedness, consisting of simple forecasting and monitoring techniques and more limited capacity to reach the public. The more sophisticated systems generally have a central coordinating body that oversees the integration of monitoring, warning and response.

Most cities have conducted simulation exercises or evacuation drills to raise the level of citizen preparedness and have sought to provide some type of facility for emergency situations – either constructing evacuation centres or stockpiling resources. A common challenge is inadequate communications infrastructure to disseminate early warning messages, although some cities have found innovative ways to overcome this.

### *Emergency planning and preparedness*

Emergency planning seeks to ensure that when a disaster occurs or is imminent, city institutions, organisations, schools and general public have the knowledge and capabilities to be able to reach a place of safety and/or escape injury or death.

Many cities undertake drills and simulation exercises to increase public and organisational preparedness for emergencies. Quito carries out drills and simulations at the institutional level as well as in communities

and schools. In Bhubaneswar, drills are held at the city, ward, and community levels as well as in schools and colleges. Evacuation drills in Cape Town's schools are monitored and supported by the city's disaster risk management staff. While some cities have only recently begun holding drills and simulations, others have institutionalised the practice and hold them for a range of different activities. For example, Dubai recently conducted its first full simulation exercise for the municipality's main building. The evacuation exercise will be carried at least once a year, particularly buildings that house critical facilities and operations such as the laboratories and plants. Dubai has also instituted evacuation plans for high-occupancy facilities such as shopping malls. In Saijo City, disaster drills have been carried out twice a year since 2007. Activities have included making sandbags, practicing carrying individuals on stretchers, gathering the population together, and communicating hazard events [48]. Engaging the public in drills and simulations is a challenge. Mumbai reported that the number of citizens participating in their drill was disappointingly low. This highlights the importance of concurrent or preceding education and awareness campaigns, to increase public knowledge of the importance of emergency preparedness.

Providing accessible emergency shelters is a key component of any evacuation strategy. These tend to double as schools or sports facilities during non-emergency periods. This is the case in Albay Province, and in Kisumu. Evacuation centres have been built next to three schools; another three are planned. Each facility includes water collection tanks and flood-resistant bore holes. Some cities maintain stockpiles of food, clothes, equipment and other relief supplies, for example in Baofeng and Makassar.

### ***Emergency response personnel***

It is common for cities to have dedicated teams or units responsible for the coordination and implementation of disaster response. These may be responsible for medical attention and basic life support, technical assistance, rapid damage assessment, or search and rescue. Response teams may be composed of paid personnel and trained volunteers. Colombo's Municipal Council's public assistance department provides post-disaster relief services in the first instance, supported with additional resources from other departments. In Makassar, the Rapid Response Team conducts quick assessment on behalf of the city's Disaster Management Agency and is made up of staff from this agency and from city departments of social affairs, public health and public works.

In Cairns, volunteer groups from Australia's State Emergency Services are responsible for search and rescue in emergency situations, assisting injured persons, protecting the community from harm and promoting community preparedness. Their work is supported by the Local Disaster Management Group, which clarifies roles and responsibilities between local government, NGOs, the private sector and the regional council's Disaster Management Unit.

### ***Monitoring technologies***

Some cities have developed sophisticated hazard monitoring and surveillance techniques for the particular hazards they face. Some focus on a single variable while others are able to handle multiple hazard parameters at the same time. Weather stations help monitor flood risk in Mumbai through 35 automatic weather stations that measure real time rainfall intensity and transmit data every 15 minutes. In addition, flow gauges have been installed upstream of the Mithi River to monitor water flow and, when needed, allow warnings downstream [25]. In Ancona, monitoring focuses on landslide risk and an advanced Integrated Landslide Management System provides hourly monitoring of high-risk slopes, using geotechnical testing, rainfall, temperature, soil moisture, and other indicators of landslide risk [47]. Some hazards do not require year-round monitoring because they are seasonal. In Baofeng, a leadership group responsible for meteorological monitoring is activated during the flood season from June to August each year [13]. In Albay Province, monitoring technology has been integrated into a computer model called SimCLIM for climate variability, which assists with climate forecasting, early warning and land use planning. A few cities have integrated a community-based element into their monitoring techniques, for example in Ancona and in Albay Province, where communities undertake rainfall monitoring at district or ward level.



### Early warning and risk communication

Several cities have worked on introducing or upgrading early warning networks, including Cairns; San Francisco, Cebu; North Vancouver; Chacao; Ancona; and Pune, to allow organisations and households sufficient time to get to a place of safety. An integrated early warning system in Chacao uses a wireless system to connect civil protection and environmental institutions to cameras that are monitoring four river channels crossing the city [55].

Some cities undertake pre-emptive evacuations of high-risk areas to ensure the population is not exposed to an imminent hazard – an approach that has contributed to a zero-casualty rate in Albay Province over the past 16 years (excluding 2006). Albay Province's local government uses a decision-tree model to decide on the appropriate moment to take this costly yet life-saving response.

The clarity and speed of risk communication information among scientists that monitor hazard data, government actors responsible for making decisions based on this information, and the public, is critical to the effectiveness of emergency response. Johannesburg identified a lack of closeness among these groups as a barrier to effective emergency response.

Some cities use online resources to communicate hazard warnings. In Chacao, real-time hazard information is available online so people can keep abreast of changes when disasters occur [55]. Other cities use mobile phones to help disseminate hazard warnings quickly. In Albay Province, an organisation called Infoboard distributed SIM cards to village officials [45]. In Cairns, citizens receive emergency alerts through the National Emergency Warning System via landline and mobile phones. But in advance of receiving these warnings, individuals must have a clear idea of how to respond. To this end, Cairns has produced evacuation guides that are available online and Saijo City has produced a map showing the areas that are projected to become submerged, with escape routes and the location and capacities of evacuation sites.

Risk communication is more challenging in contexts with limited resources and telecommunications infrastructure, such as Kampala, where there is currently no communication plan. In Moshi, if a disaster is imminent, the Council sends cars around the city to disseminate warnings via loud speakers and broadcasts warnings on local radio stations. Because there is no official hazard notification process in Pakistan, the mass media plays a critical role in disseminating risk warnings [62].



## 10. Recovery and Rebuilding Communities

**Essential 10:** After any disaster, ensure that the needs of the affected population are placed at the centre of reconstruction, with support for them and their community organisations to design and help implement responses, including rebuilding homes and livelihoods.

Work structured around this Essential and accumulated over the last 30 years has shown how important recovery and rebuilding activities are – both in terms of helping affected individuals and communities to take action and in terms of producing solutions that meet their needs.

Good recovery practices also have a direct link to reconstruction activities that have risk reduction and larger development objectives. Disaster response becomes an opportunity to improve previous conditions. One way that cities are doing this is to link recovery plans and policies with larger city development planning. During reconstruction following the earthquake, Santa Tecla developed a long-term plan for future development, through a series of public debates, which included the concept of disaster risk reduction<sup>15</sup>. In Chincha, Pisco, Canete and Ica, Peru, following the 2007 earthquake, local governments worked to integrate recovery into overall development and risk reduction. This entailed work on a range of issues, including updating and redesigning the municipalities' development plans to make them more



risk sensitive and including development and capacity-building issues—including livelihoods, gender, information management and institutional strengthening—in reconstruction [92].

Cairns is unusual in that it has a District Community Recovery Committee in which civil society and all levels of government are represented, with responsibility for taking a long-term approach to recovery and linking recovery to community needs<sup>16</sup>.

There are examples of city governments providing financial assistance to disaster-affected people to help them recover. This requires a budget that is flexible to support people's recovery in the way they deem to be most necessary (see more on this issue under Essential 2). In Pune, the city has made improvements in social protection for affected families as part of their risk reduction programme [39]. Makati's city offers assistance to disaster victims through its 'Cash-for-Work' programme, encouraging them to participate in relief and rehabilitation activities in the affected areas [31]. In Makassar, the local budget is used to support the repatriation of those displaced by disasters [19]. Cape Town's Trauma Centre assists with psychosocial support for those impacted by disasters, although the city reports that this area needs more institutional and financial support [33]. In Cairns, all three levels of government provide funding under the Natural Disaster Relief and Recovery Arrangements, which are aimed at all aspects of recovery, including assisting the community to recover from a disaster [46]. The Public Assistance Department of the Colombo's Municipal Council provides relief services post-disaster and other departments support with additional resources [17].

Some cities have invested in systems to conduct detailed damage and needs assessment to support the recovery strategy. In Albany Province, the Damage and Disaster Assessment System (DDAS) is well

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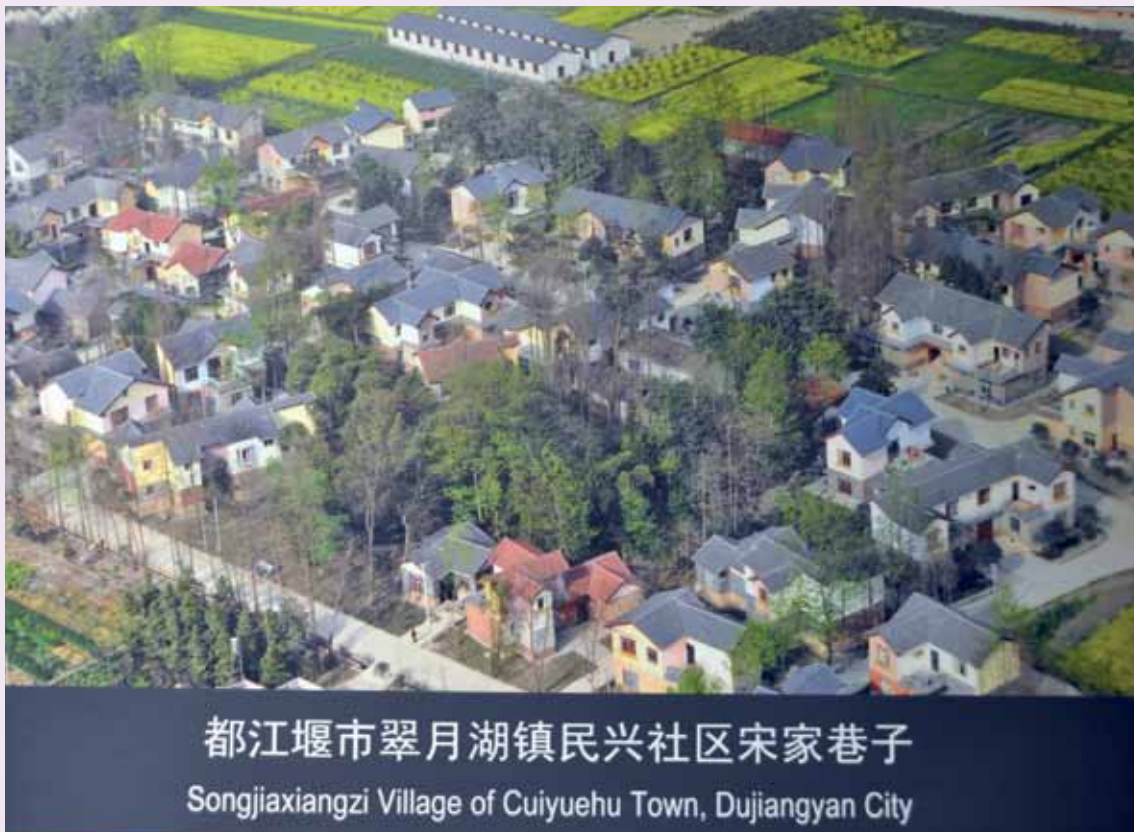
15. This included identifying community leaders and using diagnostic measures to identify each community's problems, causes and priorities, preparing a SWOT analysis of priorities by sector, and a diagnosis of institutional capacities. Sectoral Boards were created, including one for disaster risk reduction, in which the public and private sectors and civil society participate.

16. This has membership across a range of local, state, and federal government and non-government agencies. It plans for, and coordinates the delivery of longer-term community recovery underpinned by principles of understanding the community context, recognising the complex and dynamic nature of emergencies and communities, using community-led approaches, ensuring a planned, coordinated and adapted approach, effective communication with affected communities and stakeholders; acknowledging, supporting and building on community, individual and organisational capacity [46].

established. It is coordinated by APSEMO, which leads an interdepartmental team of national counterparts. Damage assessment uses risk mapping as its starting point. Data gathering is decentralised and covers all sectors; information analysis and dissemination is then centralised.

Recovery requires collaboration among sectors and stakeholders. Cairns; Makassar; and Albay Province, have all instituted a framework whereby different stakeholders work together in the recovery. As an example, Cairns' city council has a community-support subcommittee that includes the Australian Red Cross, State Emergency Services, Cairns Regional Council, Department of Communities and Homelessness and the Salvation Army to support recovery planning [46].

The important point with regard to these activities is that during the recovery period, the needs of those affected or at risk are heard, that their priorities remain central when developing plans and in decisions about budgets and spending, and that they have a seat at the table on cross-sector and multi-stakeholder boards. This is more easily said than done in the chaotic post-disaster situation, although some cities have made positive in-roads in this regard.



都江堰市翠月湖镇民兴社区宋家巷子  
Songjixiangzi Village of Cuiyuehu Town, Dujiangyan City

The region of Sichuan, China was devastated by a major earthquake in 2008. The massive reconstruction efforts involved citizens, with the cooperation of universities and other cities: the result is a vibrant region, with resilient and diversified rural-urban and urban communities.

# CHAPTER 5: LOOKING FORWARD: WHAT ARE SOME POSSIBLE APPROACHES TO MEASURING RESILIENCE IN CITIES?

Photo: UNISDR



Community leaders in the Sichuan region, contributing to future resilience.

## LOOKING FORWARD: WHAT ARE SOME POSSIBLE APPROACHES TO MEASURING RESILIENCE IN CITIES?

Local governments have expressed the need to benchmark their urban resilience efforts with clear quantitative indicators. This type of indicator will help local decision-makers prioritise resilience activities and understand the value of their investments in these areas.

Several local governments noted that the HFA Local Government Self-Assessment Tool, developed under the Making Cities Resilient Campaign, has been important in helping them to understand and recognise priority areas for action; some plan to use it for benchmarking. The self-assessment tool offers many qualitative indicators for measuring resilience. These can serve as a reference and starting point for city managers, planners, engineers, architects and economists as they develop more quantitative indicators and standards for resilience building at city level, set targets and make improvements over time. For example, the indicator under Essential 1 of the self-assessment tool on the extent of partnerships for disaster risk reduction requires that local authorities determine how to quantify the effectiveness of those partnerships in reducing risk. Similarly, under Essential 6, the strength of existing land use regulations requires more exact parameters in order to measure what constitutes strong regulations. Annex 4 contains a summary table of city activities that were presented in Chapter 4, organised by the indicators that form part of the local-level self-assessment tool.

Rather than defining precise indicators, this chapter presents ideas about what should be measured to understand urban resilience. It outlines what city managers and politicians consider appropriate indicators for resilience and is based on interviews conducted for this report. The indicators cited are context-specific and highlight that city-level indicators must be developed locally. This chapter also outlines possible indicators to help understand the resilience that urban centres may have already accumulated through the process of urbanisation, apart from specific resilience activities that directly address natural hazards. The former highlight the built-in resilience that is characteristic of well-governed cities, regardless of the impacts of natural hazards, but which are, nevertheless, important measures of resilience.

This chapter also looks at two specific areas of focus as the campaign moves forward; urban planning and financing disaster risk reduction.

The expanding body of literature on how to measure resilience reflects the growing interest across a variety of fields of inquiry. This includes measuring resilience in urban areas<sup>17</sup>. In collaboration with UNISDR and other partners, UN-Habitat's new Urban Resilience Indexing Programme launched during the Rio+20 Conference 2012 will develop new standards for measuring and scaling any city's resilience to natural, environmental, social and economic crises, and provide tools, training and support to achieving them.

### *What do local governments see as the key indicators for building resilience in their city?*

During the 11 personal interviews conducted with mayors and city managers for this chapter, respondents were asked to outline what they consider important milestones for building resilience, and the key ingredients for successful risk reduction. The results are reported in Box 5.1.

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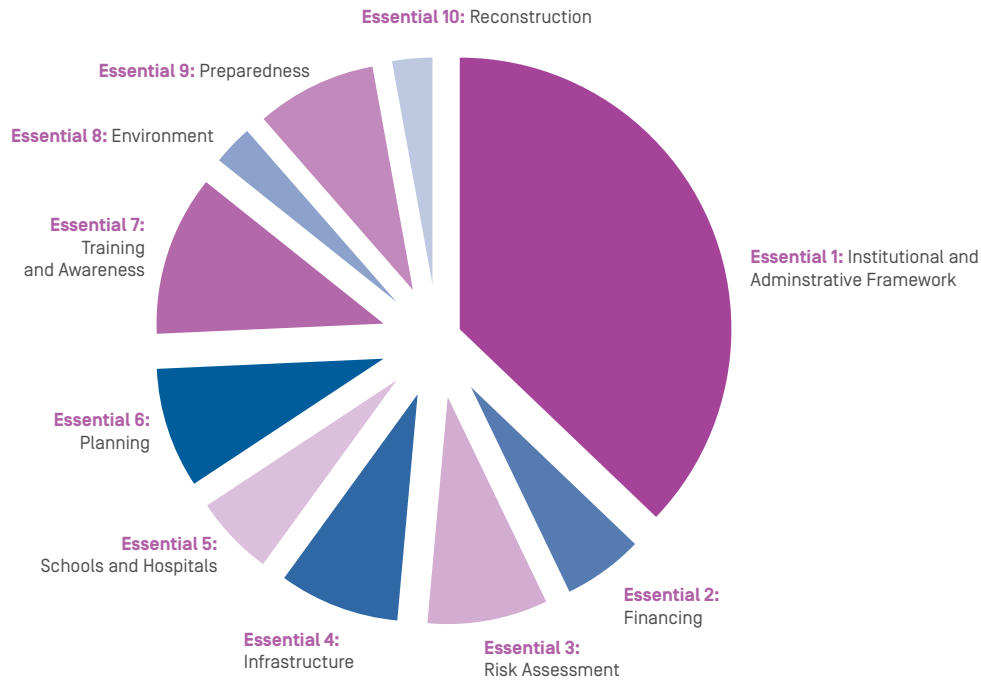
17. Some studies have produced lists of indicators, organised by themes, which provide a framework for understanding resilience and offer guidance for actions. These include frameworks developed by Twigg (2007) and Cutter et al (2008). This is a similar approach to that adopted by the Ten Essentials, and indeed there are many similarities between these three systems. Tierney and Bruneau (2007) and Zobel (2011) have adopted a much more quantitative approach (72, 73, 74).

**Box 5.1: Responses from mayors and city managers about what have been the key components of successful risk reduction in their city or municipality categorised according to the Ten Essentials.**

Essential	Key components of successful risk reduction	City
1	Interest from local authorities, regional government and community leaders	Valle de Itata, Chile
1	A unique disaster management division has the primary responsibility	Mashhad, Iran
1	Full coordination among municipalities and other institutions related to disaster management	Mashhad, Iran
1	Level of stakeholder buy-in, e.g. membership in committees, participation of different sectors in resilience-building activities	Siquirres, Costa Rica
1	Community engagement (e.g. being grateful for projects, receiving comments and suggestions)	Siquirres, Costa Rica
1	Mayor signing on to the Campaign as a commitment to disaster risk reduction	Ancona, Italy
1	Policies put in place by the Governor	Bangkok, Thailand
1	Municipalities working together in disaster risk reduction	Valle de Itata, Chile
1	Creation of dedicated boards for disaster risk reduction	Barcelona, Spain
1	Allowing youth to step up and take ownership of actions to improve disaster risk reduction	Cape Town, South Africa
1	Political will and long-term vision from authorities	Telica, Nicaragua
1	Coordination and cooperation among various stakeholders	Amadora, Portugal
2	Securing national-level budget for local-level disaster risk reduction	Siquirres, Costa Rica
3	Risk assessment studies undertaken	Amadora, Portugal
3	Self-assessment of hazard risks and their own capacity to build resilience	Siquirres, Costa Rica
4	Construction of 100 septic tanks for 100 houses	Telica, Nicaragua
4	Completed infrastructure improvements to cope with the impact of floods	Siquirres, Costa Rica
5	Targeted actions to make schools safer	Telica, Nicaragua
6	Reconstruction and retrofitting of high-risk urban areas	Mashhad, Iran
6	Prioritising high risk communities (informal settlements)	Cape Town, South Africa
7	Publications about good practices	Amadora, Portugal
7	International recognition and awards (e.g. being a role model, Sasakawa Award)	San Francisco, Philippines
7	Becoming part of international networks, which 1) facilitates knowledge-sharing and 2) increases competition between cities which motivates them to do more	San Francisco, Philippines
9	Installation of flood warning systems	Mashhad, Iran
9	Nationwide earthquake drill held in Mashhad at the highest level and most crowded areas.	Mashhad, Iran
All	The high number of initiatives that have been achieved	Amadora, Portugal

Box 5.1 demonstrates three notable results. First, a heavy concentration of responses relate to diverse aspects of Essential 1 - the administrative and institutional framework for resilience [See Figure 5.1], namely which aspect of governance is important in their city. Some respondents cite as critical the development of a dedicated body, or political commitment; others view different sectors and actors working together as most important.

## What cities interviewed indicate as components of successful risk reduction in their city



Second, projects that address specific risks, including improving infrastructure to control floods retrofitting buildings, or construction of safe schools, were cited as the second most important component of resilience building, based on the specific risks facing the respondents' cities.

Third, the risk reduction priorities of local governments are context-specific, pointing to the fact that indicators must be locally developed, based on the city's risks and its current governance systems. A city in an earthquake-prone area with many buildings that are not earthquake-resilient would see retrofitting and replacement of this building stock as a chief indicator of their resilience. Another city that has recently experienced a large-scale disaster would prioritize risk-sensitive urban planning and the initiation of activities to address risk as a good indicator of resilience. For a territory (region) plagued by regular flooding, cooperation among regional stakeholders of a river-basin may be an important indicator. These findings reveal that existing global indicators as part of a planning process are just a starting point and that the process itself of developing local and context-specific indicators is an equally important step toward resilience.

## Box 5.2: Quirihue : PLADECO reflects community engagement

Quirihue is a member of the Association of nine Municipalities of the Valle de Itata region of Chile. The following example offers insight into how local governments collectively define priorities. Quirihue (and the region of Valle de Itata) was close to the epicentre of the major 8.8 magnitude earthquake on 27 February 2010<sup>18</sup>. Subsequently, UN-Habitat, the Association Territoires Solidaires and UNISDR helped to organize training on local-level development and the Ten Essentials for making cities resilient. Through engagement in the Campaign, the municipality began including measures to deal with disasters more effectively and has integrated disaster risk reduction and resilience into their Community Development Plan (PLADECO), developed for the period 2012–2015, guided by principles of the Ten Essentials.

PLADECO is the formal instrument for development planning at the local level in Chile. It guides municipal action on addressing community needs and provides guidance on investments for other government institutions and private actors. The process by which Quirihue developed this plan points to how priorities, and by extension, indicators, could be collectively developed. During preparation of the plan, the city undertook a qualitative diagnosis with organisations and local actors. The municipality used many vehicles to increase community engagement (advertising via blogs and websites; radio ads; flyers handed out on the street, etc.). This led to a roundtable discussion in early 2012 on the community's weaknesses and strengths, including managing risk. Participants (91 people) were grouped according to their profile (i.e., urban social organisations, rural social organisation, youth, traders and entrepreneurs, representatives of institutions and public services, etc.). Facilitators guided discussions around questions including: What are the community's main problems? What are the main problems in the neighbourhood or sector where you live? What are the community's strengths? What opportunities do you see for community development? What are some potential solutions to the problems identified? This consultation helped identify planning priorities, including those for risk reduction.

One of PLADECO's strategic objectives is to reduce disaster risk in Quirihue to achieve sustainable local human development, through comprehensive risk management, led by the municipality. In this regard, the municipality also developed a Disaster Risk Reduction Plan, which designates financial responsibilities [see summary in Box 5.2]. These activities set forth in the plan, could translate into quantitative indicators of resilience and an analysis of the achievement of goals would serve as a barometer of the city's resilience.

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18. The quake impacted six of the country's 13 regions, where 80 per cent of the population lives. The majority of the country's hospital facilities are located in these regions, with 77 per cent (20,950) of hospital beds. Two months after the event, authorities estimate that the earthquake affected 2 million people; 370,000 homes, 73 hospitals, and 4,012 schools (nearly half the schools in the affected area) were damaged or completely destroyed. The cost of losses and damage is estimated to reach US\$ 30 billion, equivalent to 17 per cent of the country's gross domestic product. [Source: PAHO/WHO].



## Disaster Risk Reduction Plan, as part of Community Development Plan of Quirihue, Chile, 2012-2015.

Disaster Risk Reduction Plan							
Specific Objective: Implementing emergency humanitarian aid, rehabilitation, recovery, reconstruction, mitigation, prevention and preparedness measures to reduce disaster risk.							
Corresponding Essential	Programme, project, research or action	Responsible institution	Financed by	Schedule			
				2012	2013	2014	2015
All	Ratify community adherence to global campaign "Making Cities Resilient"	Municipality	Municipality				
1	Establish a Community Office for Disaster Risk Reduction	Municipality	Municipality/ Ministry of Interior				
1	Prepare and approve a Community Decree on Disaster Risk Reduction	Municipal council	Municipality				
6	Update the study on community planning to regulate risk	Municipality	Municipality / SEREMI V y U.				
1	Create a DRR community committee	Municipality / OCPC	Municipality / Ministry of Interior				
9	Acquire emergency vehicles	OCRRD / SECPLAN	Circular 33				
9	Acquire and/or upgrade equipment (GPS, maps, telephone satellite, radio equipment, instrumental, etc.)	OCRRD / SECPLAN	Ministry of Interior / Municipality				
6	Prepare and approve a Community Transport Plan and public ordinance.	Transit Department / Municipality	Municipality / SUBDERE				
4	Institute a seasonal flood prevention and mitigation programme (winter)	OCRRD	Municipality				
4	Conduct research to improve runoff rainwater in urban Quirihue	SECPLAN / DOM	SUBDERE Concurrent action				
4	Construct drainage system for urban Quirihue	SECPLAN / DOM / DGA MOP	SUBDERE Concurrent action				
1	Encourage the creation of DRR neighbourhood committees	OCRRD	Municipality				
7	Train community on DRR	OCRRD	Municipality				
1	Train members of the DRR Committee and municipal officials on integrated management of risk.	OCRRD	Municipality / ONEMI				
9	Evaluate and enable shelters and evacuation routes according to hazards (earthquake of great intensity, floods, forest fires, other).	OCRRD	Municipality/ Ministry of the Interior				
9	Educate the community with regards to evacuation plans.	OCRRD	Municipality / ONEMI				

## How to measure resilience accumulated through the process of urbanisation and city building

The provision of core social infrastructure and services upon which urban dwellers depend on a daily basis is an essential measure of resilience to natural hazards. Cities that offer basic services accessible to all citizens, regardless of income, such as healthcare, education, rule of law, and environmental standards to protect health, are generally more resilient to natural hazards. The extent to which infrastructure such as drainage systems and paved roads exists and is well maintained is also a measure of the city's resilience.

### Box 5.3: Measures that possibly could be developed into indicators<sup>19</sup>.

Resilience accumulated through the process of urbanisation and city-building	
Services that are a public right regardless of income	Standard infrastructure
Health care Education Street cleaning Emergency services for fire/acute illness/injury/crime Policing and the rule of law Recourse to the courts if needed Vote Access to politicians, civil servants, ombudsmen	Storm and surface drainage systems Paved roads and paths Street lightening
Public services that are paid but affordable for most	Standards to provide protection
Public transport Water Sanitation Solid waste collection Electricity	Wage standards Safe working conditions Employer supported benefits Building standards to ensure minimum health/comfort. Management of road traffic Consumer protection and environmental health Urban plans and their implementation
Safety-nets available if income is insufficient	Personal investments in resilience
Social security Pensions	Life insurance Insurance for possessions and homes Savings Pensions Asset ownership

The demands of citizens and civil society on local and national governments to provide affordable access to basic services are a core driver of resilience to disasters. As seen in Campaign cities, often resilience is the product of a long process of political pressure from those who lacked some aspect of resilience and their political allies. It is achieved through legislative changes, funding allocations within political systems, and the effectiveness of their implementation, within bureaucratic structures of local governments. In some cities, where local governments are not able to provide basic services, or there is an infrastructure deficiency, resilience depends on effective organization by those who are vulnerable, to get this addressed.

Another measure of resilience could examine how these basic services ultimately protect the most vulnerable—those with limited incomes, illness, or disabilities—to different hazards. This would provide insights on how regular municipal services 'accumulate resilience' to reduce risks to natural hazards and other risks.

The key issue is whether all levels of government use their structures and capacities to respond to challenges posed by natural hazards. If a city can assess the extent to which it has accumulated resilience,

19. This section, including the table, is drawn from Satterthwaite, David [2012]. An alternative take on what builds resilience. Presentation for Urban Transitions in Comparison: contested pathways of urban climate change responses North and South, Durham University, 22-23 March 2012.

it can use this as a basic building block for improvements that address hazards. For example, building and infrastructure standards can be improved (increasing storm water runoff; revisiting build codes); existing service provision can be adjusted for new risks or risk levels (measures to reach populations affected by heat waves, etc.); land use management can be adjusted to new or heightened risks and all of these can be supported by changes over time in private sector investments, changes in insurance premiums and coverage.

### *Measuring resilience through urban planning and its implementation*

As this report has shown, several Campaign cities are using urban planning as a tool for risk reduction, and many see this as a key component of resilience. Box 5.4 offers a list of some aspects of urban planning that together with their implementation can contribute to resilience.

#### **Box 5.4: How urban planning can contribute to resilience and disaster risk reduction**

- Working with multiple stakeholders throughout the planning process to identify known risks, needs and potential solutions, realising the potential of communities to contribute to risk reduction.
- Incorporating risk assessment – considering exposure, vulnerability and hazards, urban settlements development and services– in all urban development designs, projects and programmes.
- Making safe land available for urban development, avoiding construction in disaster-prone areas, leaving buffers and providing recreational areas.
- Ensuring that public space for streets, infrastructure and parks is identified and protected.
- Upgrading informal settlements, with attention to access roads, flood-risk, other safety measures.
- Installing risk-reducing infrastructure, including drainage and sewerage systems
- Assessing how urban development contributes to improving the lives of the poorest or most vulnerable people in a city.
- Developing good information on risk and communicating risk information widely.
- Protecting ecosystems to allow proper storm water drainage, avoid extensive erosion and protect against storms and tidal waves.
- Developing plans for post-disaster reconstruction that reduce future risk.

According to UN-Habitat, the importance of urban planning in building resilience has many implications. First of all, urban planning allows towns and cities to be analysed and planned as a system comprised of various sectors and institutions. This is crucial in coping with interdependencies among failures in infrastructure in disaster situations. Urban planning also contributes to preventing secondary disasters and delays in the rehabilitation and recovery process. Disaster risk assessment, preparedness and planning for recovery, with multiple stakeholders involved in urban management before a disaster, is one potential solution that can contribute to foreseeing multiple systems failures as well as avoiding sectorisation of recovery planning after disasters.

Secondly, the planning exercise can reinforce stakeholder relationships, institutional frameworks and partnerships among all urban stakeholders, particularly planners architects, engineers, disaster and risk reduction management specialists, sectoral specialists, private sector, and communities to address risk reduction and resilience in a holistic manner.

Thirdly, is important to strengthen the legal planning frameworks and codes in urban areas to support resilience. Cities, towns and settlements are expanding and village settlements are becoming towns and cities. A legal framework can guide future planning and integration of disaster risk reduction. As outlined in Essential 6, it is important to apply and enforce realistic and risk compliant codes that can also meet the needs of low-income citizens and guide up-grading of informal settlements.

Developed with UN-Habitat for this report.

Measures for resilience building through urban planning can simultaneously improve the quality of life of residents. Although some merely compare the cost of implementing resilience activities to the benefit of saving lives and assets and conclude that investment after a disaster is more cost effective, the positive effect of resilience measures is not only limited to saving lives and assets. Measures such as securing access roads in informal settlements and upgrading and providing sufficient public space lead to overall improvement in the quality of life of a city's residents. Measures to build resilience not only help cities to bounce back at the time of crisis, but also go hand in hand with bettering the quality of life of the residents, thus making investment in resilience pay in the long run.

## *Measuring financing of DRR and budgets for DRR*

Local governments cite the lack of adequate, sustainable resources, both human and financial, as a major barrier to implementing disaster risk reduction plans. An analysis of cities involved in pilot testing the self-assessment tool revealed that Essential 2, Financing and Resources, scored lowest across of all the Essentials, meaning that this was the area in which cities felt they were making the least progress<sup>20</sup>.

Getting an accurate account of the total city budget allocated to disaster risk reduction is not a straightforward matter, as much of the budget is mainstreamed into related programme areas, such as major urban projects and critical infrastructure. Identifying dedicated financial resources for risk reduction requires a sophisticated analysis of a city's finances, as well as a deeper understanding of how national governments allocate and tag related spending.

National studies are being conducted to track budgets related to disaster risk reduction in the Philippines, India, Indonesia, as well as in cities in Latin America. The Government of Indonesia is proposing a set of budget codes that would allow for tracking of different types of risk reduction activities and expenditures at national scale.

In the context of city-level indicators, it is worth defining how municipal budgets that are owned by different departments are being used for activities related to the Ten Essentials, in addition to dedicated risk reduction budgets.

As evidenced by the on-going activities presented under Essential 2 in Chapter 4, cities have tapped into different sources of financial support for disaster risk reduction (see a summary in Table 5.4). Municipal budgets are a primary source of financing. In some countries, such as the Philippines and Peru, there are national budgets for disaster risk reduction with dedicated, which can contribute to city-level budgets, that can, in turn, be complemented by third-party funding sources, such as donors, the private sector, humanitarian organisations and aid agencies. One difficulty detected at the municipal level is the lack of knowledge to articulate and initiate requests to access available national funds. In terms of indicators, or measurements of resilience, what is needed is an understanding of how budgets are being spent and how effectively this spending contributes to reducing risk for all sectors of society.

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20. Gawler, Steve and Alice Balbo (2011). Promoting Local Authorities Leadership for Urban Risk Reduction: ICLEI Final Project Report. ICLEI World Secretariat, Bonn, Germany.

### Box 5.5: Types of Financing for Disaster Risk Reduction Used by the Campaign Cities

Type of financing	City Examples
Direct municipal budget for DRR	Beirut, Cairns, Makassar, Colombo, Albay, San Francisco (Philippines), Makati
Mainstreamed municipal budget	Quito, Cape Town, Cairns, Makassar, Colombo, Barcelona
National budget for disaster risk reduction	Philippines
National funding available (subject to city bid)	Chile, South Africa, Sri Lanka
Budget for disaster relief/response/recovery	Cape Town (from national-level), Makati, Thimpu
Partnerships with international organisations (including NGOs)	San Francisco (Philippines), Makassar, Kisumu, Mumbai, Istanbul, Makati, Dubai, Batticaloa, Tyrol
Partnerships with local NGOs	San Francisco (Philippines), Makassar, Cape Town, Makati, Overstrand
Technical Assistance	Makati, Mumbai, Bangkok, Istanbul,
Private Sector	Siquirres, Cape Town, San Francisco (Philippines), Makassar, Makati, Chacao, Tyrol

#### Next steps

This chapter has looked at possible ways to measure resilience and points to future steps for developing tools to aid cities and municipalities to do so. Ultimately, the context of each city and country is different, and therefore, how a city measures its own resilience must be locally driven. The participating partners and local governments in the Making Cities Resilient Campaign can work towards developing clear tools and methods to assist cities to measure the effectiveness of disaster risk reduction practices and link these to other on-going initiatives on resilient cities and urban performance indicators. The application of the Ten Essentials and the HFA Local Government Self-Assessment Tool is a starting point, and cities are actively working on many of these aspects. In addition to planning and measuring specific disaster risk reduction actions, it is also important to measure the accumulated resilience in cities, linked to basic services, which will give an overall picture of how well a city can withstand and bounce back from a hazard event.

It is likely that the Making Cities Resilient Campaign will contribute, in the coming years, to improving the understanding of and local knowledge about disaster risk reduction, better urban planning principles for resilience building and city-level financing and investment for disaster risk reduction.

## Chapter 6.

### Conclusions of the report

This report set out to review trends in urban resilience and identify factors that contribute to or enable progress in reducing risk at the local level. Through analysis of case material provided by cities and Partners participating in the Making Cities Resilient Campaign, several broad conclusions are evident:

1. **Innovation abounds despite variable baseline urban conditions.**
2. **The Making Cities Resilient Campaign has triggered new momentum.**
3. **Commitments to date can be strengthened and extended.**

#### *1. Innovation abounds in very diverse settings*

The city cases reviewed in this report are very diverse with varying levels of socio-economic development, size and economic bases. Cities as apparently different as Pune in India, Kampala in Uganda and San Francisco in California have demonstrated a common ability to further strengthen their capacities, commitment and, ultimately, reduce losses – regardless of their baseline conditions.

Moreover, cities reported here include some that had historically given little attention to issues of disaster risk and resilience and others that have already established a solid foundation for urban resilience. Some cities such as Siquirres, Beirut and Dubai have taken their first steps through small but focused activities that initiated more sustained action. Cities with more mature mechanisms in place, such as North Vancouver, Mumbai, Makati and Albay Province, demonstrated more active leadership through revisiting the impact of their own efforts and sharing insights with others.

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**“Governments at all levels must focus less on what is destroyed by natural hazards and more on what can be improved. The challenge facing governments is not always about a lack of money, but about understanding how you spend the resources you do have. This is where the Campaign is playing a critical role now and will continue to do so in the future. Educating communities and governments at all levels about the vulnerabilities linked to rural-urban migration and the importance of investing in critical infrastructure, especially roads, flood defenses and protecting schools and hospitals, should be a strong focus for the campaign going forward.”**

Hon. Byarugaba Alex Bakuuda,  
Member of Parliament, Uganda.

In small urban centres, activities tend to focus on upgrading and repeated cleaning of drainage systems to cope with floods, or putting in place early warning systems to reduce vulnerability to storms. Here, local governments often rely on community participation, as well as input from NGOs and local universities. In large cities, disaster risk reduction is more complex. It requires an institutional process that encompasses strategic planning, assigned budgets, and a more sophisticated understanding of multi-hazard risk and vulnerability and how they are interconnected.

In describing the broad range of activities that they have undertaken, cities have been able to identify enabling factors contribute to progress:

- Leadership and political will
- Sustainability at local level
- Engagement in high impact activities early on
- City-to-city learning and international support
- Integrating disaster risk reduction as a cross-scale and multi-sector issue
- Addressing existing infrastructure deficits

Yet, beyond these features, cities remain as centres of culture and innovation. The innovative spirit of the local governments participating in the Campaign is evident across the board.

No city begins with all the political, technical or financial resources it wants; and no [or few] local government count on 'perfect institutions,' yet all the cities reviewed in this report were able to leverage the resources they did have. In some cases these resources came in the form of using existing finances more efficiently; in others, they were available thanks to the creativity of their citizens or leaders with vision. Often, it is the willingness to engage communities and partners that has stimulated progress despite limited resources. Where, for instance, citywide storm and surface drainage system are improved to cope with extreme rainfall, or building stock and other infrastructure are designed to withstand high winds, multiple benefits for local development are being achieved. Innovation, whether home-grown or shared from afar, remains an essential instrument in overcoming the very real challenges to building and sustaining resilience in our cities.

## 2. The Making Cities Resilient Campaign has triggered new momentum

The report highlights how the Making Cities Resilient Campaign, which is led by UNISDR but is self-motivating, partnership—and city-driven—has raised the profile of resilience and disaster risk reduction among local governments and urban communities worldwide. In the 1,050 cities that are currently signed up, participation has served to legitimize on-going work and to inspire local governments to better understand the scope risk and to initiative new efforts that reduce disaster risk and build resilience.

### Box 6.1: Key achievements of the Making Cities Resilient Campaign to date [2010-2012]

- **Strengthened local level leadership and political will for disaster risk reduction:** In some instances, the Campaign has served as the inspiration for evaluating and improving existing disaster risk programmes; in other cases, it has served as the conduit for new resilience planning.
- **Increased encouragement for national authorities and parliamentarians to de-centralise mandates and mobilise resources:** The Campaign has functioned as a vehicle through which cities and municipalities are raising their voice and that of their constituents at national and international levels on disaster risk reduction. This is evidenced in several mayoral/local government declarations, committing to city-level actions on resilience. At least nine significant declarations or manifestos have been signed since May 2011, endorsed by Mayors, local government representatives and other partners globally (see Time line, Annex 5).
- **Broadened access to reliable disaster risk information and tools:** The Campaign is meeting strong demand from local governments for access to regular and reliable information on disaster risk reduction, the current debate on these issues and its links to sustainable development and climate change. In addition to the network of partners, who provide direct expert advice and information, the Campaign tools such as the Ten Essentials, Handbook for Local Government Leaders and HFA Local Government Self-Assessment Tool have been increasingly translated by local stakeholders and used as basis for local planning and decision making. The demand is strong for standardised approaches that can be used as basis for locally designed processes and solutions.
- **Document what cities are doing:** Learning by example has been a constant recommendation of local governments participating in the Campaign. Systematic documentation has been difficult but rewarding; this report and similar future editions aim to respond to this need. Supporting collaborative knowledge-sharing, city-to-city learning workshops, events, awards, and improvements to the Making Cities Resilient website ([www.unisdr.org/campaign](http://www.unisdr.org/campaign)) remain essential elements to documenting and learning. Academia and research institutions are building on the networks and the formulated demand through the Campaign.

- **Strengthened partnerships:** The Campaign supports a participatory approach to resilience building that fosters dialogues between local governments, national authorities, legislators, civil society, private sector, professional associations and academia, who previously may have had limited interaction with each other. The Campaign currently counts on more than 40 global or regional organisation partners, which are supporting knowledge products, training or technical assistance to cities to build resilience. Many pilots, trainings and capacity building initiatives are associated with the Campaign and based on its tools. Donor agencies, including some of the European Commission Directorates, are making explicit use of the Campaign tools.

### ***3. Commitments to date can be strengthened and extended***

Despite the significant efforts underway by the cities documented in this report, much remains to be done to make disaster risk reduction a priority for many local governments.

#### ***Increase the number of cities where commitments lead to action***

Approximately one billion urban dwellers today live in informal settlements, most of which lack the services and good quality buildings that are a key part of resilience. Most of the anticipated increase in the world's population between now and 2030 will be in urban centres in Africa and Asia – and a large part of this will be in small and medium urban centres in these regions that lack basic infrastructure in general and services to cope with disasters.

As the examples from Kenya and Tanzania show, many cities have signaled commitment but have yet to take action to address disaster risks. While competing priorities are often cited as constraining factors, increased support to establishing the enabling environment and promotion of innovation can unlock doors to progress. The factors outlined in this report provide guidance for increased support. Among these, showcasing local leadership in national and international forums can play an instrumental role in increasing the flow of political, technical and financial support for local action.

#### ***Integrate disaster risk reduction into development planning processes and daily city operations***

Many aspects of the Ten Essentials are inextricably linked to development processes and decisions.

Multiple benefits for both development and disaster resilience derive from investments in good governance and improvements in urban infrastructure, health and education, for instance.

While the initiatives undertaken by many of cities reported here are significant, very few have systematically leveraged the instruments of development.

Introducing measures such as risk screening into the planning and design of urban infrastructure, for instance, can save lives and extend the longevity of critical infrastructure. Having infrastructure that is fit for purpose and well maintained is part of disaster risk reduction and resilience, but it is also central to the smooth functioning of the city, its economy and people's well being. Factoring risk into land use planning procedures can reduce exposure to natural hazards. Protecting schools and hospitals can hasten achievement of poverty reduction goals.



Many of these tools are well known, yet implementation of integrated approaches remains limited. The potential value of resilient development, in both public and private sector, is unlikely to be realised without the full engagement of development planners and their instruments. Where national policies lag behind, local commitment to improved planning and targeted engagement with the private sector and other development partners can provide powerful stimulus.

Moreover, disaster risk reduction can be integrated into a city's day-to-day operations. The Mayor's Task Force on Urban Poverty and Climate Change Adaptation hosted by the World Bank, for instance, built a strong case for cities to focus on basic municipal operations, such as solid waste collection and clearing of drainage systems as a direct measure for reducing flood risk in cities such as Dar es Salaam and Jakarta.

### *Leverage the Campaign and other global and regional initiatives*

The local governments analysed for this report all aspire to create safer places to live and work. Realising this aspiration requires strong political will and accountability in governance. It also requires urban planning and implementation mechanisms that reflect the needs of people, including the most vulnerable. Cities must be able to count on financial support and be able to sustain disaster risk policies, beyond frequently revolving political administrations.

Looking towards 2015, the Campaign will continue to raise awareness of the principles for making cities more resilient. In addition to targeting a greater number of cities and councils, the Campaign will promote city-to-city learning and capacity building, and will document demonstrable advances in reducing disaster risk. The core objectives over the next two years are to strengthen local leadership and ownership of the resilient cities agenda and to encourage standardised approaches to resilience that reflect cities' shared values and innovations.

A number of associated, ongoing global initiatives provide influential mechanisms for making cities resilient. ICLEI's annual Resilient Cities Conference in Bonn, the UN Framework Convention on Climate Change, UN-Habitat's World Urban Campaign and Urban Resilience Indexing Programme, UCLG's agenda to promote decentralization and their 2030 Manifesto are just a few of the mechanisms where cities can advance this agenda and where the Making Cities Resilient Campaign will remain engaged.

Finally, active participation and leadership of city and local government levels is vital for articulating the post-2015 global development agenda and the post-2015 Hyogo Framework for Action. Engagement in global processes can be instrumental in linking national and local partners in the common pursuit of resilience. These processes will remain a top priority for the Campaign partners and UNISDR.

# Partners in the Global Campaign Making Cities Resilient: My City is Getting Ready!

Many international, regional, national and private sector partners are supporting activities and local governments in the global campaign Making Cities Resilient, whose objectives are to improve capacities to deal with disaster risk at city level in each country. The most active partners include networks of cities such as United Cities and Local Governments (UCLG), ICLEI-Local Governments for Sustainability, CITYNET and the Earthquake Megacities Initiative (EMI); international organisations such as the European Commission (ECHO), the World Bank Global Facility for Disaster Reduction and Recovery; UN agencies and programmes, with UN-Habitat in the lead; NGOs and their networks (notably the Chinese-based World Cities Scientific Development Alliance—WCSDA); the Global Network of Civil Society Organisations for Disaster Reduction; PLAN International; GROOTS International (with the Huairou Commission); academia and private sector companies, through the UNISDR Private Sector Advisory Group; national associations of local governments; and national authorities and National Platforms for Disaster Reduction.

## The principal partners that have supported the development of this Making Cities Resilient Report 2012 include:

### **UN International Office for Disaster Risk Reduction (UNISDR)**

[www.unisdr.org](http://www.unisdr.org)

The United Nations Office for Disaster Risk Reduction (UNISDR) is the UN focal point for the coordination of disaster

risk reduction activities and leads a vibrant network that includes UN Member States, intergovernmental and non-governmental organisations, financial institutions, the private sector, scientific and technical bodies, and civil society. UNISDR is spearheading the current campaign to create global awareness of the benefits of disaster risk reduction and empower people to reduce their vulnerability to hazards. The Campaign on Making Cities Resilient has mobilized—through the end of 2011—more than 1,000 cities and local governments who have committed to making their cities safer and more resilient to disasters, in support of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities. UNISDR is the custodian of this Framework and the International Strategy for Disaster Reduction, which is applied by governments and other stakeholders. Advocating for including crosscutting issues such as climate change, education and gender into risk reduction initiatives, UNISDR prepares a biennial Global Assessment Report on disaster risk reduction and analysis of the natural hazards that affect humanity.

### **The Global Facility for Disaster Reduction and Recovery**

[www.gfdrr.org](http://www.gfdrr.org)

Established in 2006, the Global Facility for Disaster Reduction and Recovery (GFDRR) is a partnership of 41 countries and eight international organisations, hosted at the World Bank, committed to helping developing countries reduce their vulnerability to natural hazards and adapt to climate change through three tracks: Global and Regional Partnerships; Mainstreaming Disaster Risk Reduction into Development; and Standby Recovery Financing Facility for Accelerated Disaster Recovery. The partnership's mission is to mainstream disaster risk reduction and climate change adaptation into country development strategies by supporting a country-led and managed implementation of the Hyogo Framework for Action.

### **ICLEI - Local Governments for Sustainability**

[www.iclei.org](http://www.iclei.org)

ICLEI is an international association of more than 1,200 cities and their associations worldwide as well as local, national and regional government organisations who have made a commitment to sustainable development. ICLEI drives positive change on a global scale through programmes and campaigns on local sustainability. It is also a resource center, offering information, tools, networking, training and consulting services. ICLEI serves as Secretariat of the World Mayors Council on Climate Change, which launched the Mayors Adaptation Forum as an annual platform

for exchange and policy discussion on urban resilience. ICLEI, together with the WMCCC and the City of Bonn, has launched a series of annual world congresses on cities and adaptation to climate change—"Resilient Cities"—and will convene the fourth global forum on urban resilience in 2013. In addition to low carbon and climate neutral cities and green infrastructure, the goals of ICLEI's 2010-15 strategic plan now include "resilient communities."

### **United Cities and Local Governments (UCLG)** [www.cities-localgovernments.org](http://www.cities-localgovernments.org)

UCLG is the world's largest organisation of local and regional governments, working in 140 countries to represent their interests, regardless of the size of the communities they serve, advocating for democratic local self-government, and promoting their values, objectives and interests, through cooperation among local governments and within the wider international community. In the field of resilience and disaster risk reduction, UCLG is an active participant in awareness campaigns and information dissemination, helping its members to put disaster risk reduction on the local and regional political agenda. UCLG ensures that the national structures work with local governments on disaster risk reduction, risk reduction functions and resources and that local authorities have access to UN and international risk prevention funds.

### **CITYNET** [www.citynet-ap.org](http://www.citynet-ap.org)

CITYNET is a regional network of urban stakeholders for the Asia-Pacific region, including local governments, development authorities, non-governmental organisations (NGOs), community-based organisations, research and training institutes and private companies committed to helping local governments improve the sustainability of human settlements. It helps cities and local governments provide better services to citizens, with a commitment to capacity building at the local level.

### **Earthquake and Megacities Initiative (EMI)** [www.emi-megacities.org](http://www.emi-megacities.org)

EMI is an international, not-for-profit scientific organisation dedicated to the reduction of disaster risk in megacities and major metropolises. EMI's mandate is to build capacity in developing countries by enabling acquisition and application of scientific knowledge in both policy and practice to strengthen urban earthquake preparedness and mitigation. EMI draws strength from its network of partner cities, research and

academic institutions, and professional and local government organisations worldwide. By working collaboratively with its partners, EMI has developed competence in analytical approaches, strategic planning and problem-solving for disaster risk reduction, including the model Disaster Risk Management Master Plan, a tool to guide local authorities and partner institutions in mainstreaming disaster risk reduction into governance processes and functions through a participatory planning process.

### **United Nations Human Settlements Programme (UN-Habitat)** [www.unhabitat.org](http://www.unhabitat.org)

The United Nations Human Settlements Programme (UN-Habitat) is the UN agency for sustainable urban development. It is mandated to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all. UN-Habitat's Disaster Management Programme is the agency focal point for provision of assistance to governments and local authorities in countries recovering from war or natural disasters. It also provides technical assistance to help prevent future crises arising from natural hazards. Working with partners, including the UNISDR, Red Cross and Red Crescent movement and others, UN-Habitat counterparts in government, civil society and the private sector, aim to ensure that cities of the future are resilient, well-planned and reduce their impact on the environment.

## Acronyms

<b>CIB</b>	International Council for Research and Innovations in Building and Construction [acronym from French: “Conseil International du Bâtiment”]
<b>CORILA</b>	Consorzio Ricerche Laguna (Venice, Italy)
<b>DRA</b>	Disaster Risk Assessment
<b>DRM</b>	Disaster Risk Management
<b>DRR</b>	Disaster Risk Reduction
<b>ECHO</b>	European Commission’s Humanitarian Aid Office
<b>EMI</b>	Earthquake and Megacities Initiatives
<b>EOC</b>	Emergency Operations Centre
<b>FAO</b>	Food and Agriculture Organisation
<b>GAR</b>	Global Assessment Report on Disaster Risk Reduction (UNISDR)
<b>GIS</b>	Geographic Information System
<b>GNDR</b>	Global Network of Civil Society Organisations for Disaster Reduction
<b>GROOTS</b>	Grassroots Organizations Operating Together in Sisterhood
<b>HFA</b>	Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters
<b>HFA-LGSAT</b>	Hyogo Framework for Action - Local Government Self-Assessment Tool
<b>ICLEI</b>	Local Governments for Sustainability
<b>IIED</b>	International Institute for Environment and Development
<b>JICA</b>	Japan International Cooperation Agency
<b>NGO</b>	Non-Governmental Organisation
<b>PAHO</b>	Pan American Health Organisation, WHO Regional Office
<b>PLADECO</b>	Plan de Desarrollo Comunitario (Chile)
<b>SES</b>	Australia State Emergency Services
<b>UCLG</b>	United Cities and Local Governments
<b>UNDP</b>	United Nations Development Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organisation
<b>UN-Habitat</b>	United Nations Human Settlement Programme
<b>UNISDR</b>	United Nations International Strategy for Disaster Reduction
<b>WCSDA</b>	World Cities Scientific Development Alliance (China)
<b>WHO</b>	World Health Organisation

## Annexes

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## Annex 1a.

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## Annex 1b. Methodology of the study

This report is based on documentation provided by the urban centres involved in the Campaign. These documents include presentations made at Campaign meetings between 2010 and 2012 and reports from local governments reporting on the results of application of the HFA Local Governments Self-Assessment Tool. This report has also drawn information from documents prepared by NGOs and researchers, including documentation prepared by local governments that have applied for the UN-Sasakawa Award for Disaster Reduction. The IIED team preparing this report also conducted eleven personal in-depth interviews with Campaign city representatives and received ten written questionnaires (see interview questions in Annex 1c). In total, more than 90 sources and documents have been analysed from 42 cities. The UNISDR team collected additional feedback and information from cities and partners for the report. UNISDR transferred all reports and documentation received by cities to IIED and the authors during the kick-off workshop to define the scope of this report, held in Geneva, May 2012. Where no definite date of the original issuance of a document is noted in the List of Reference, May 2012 has been used.

The activities documented throughout the report are, by and large, self-reported by the cities. In this regard, the report provides a considerable level of detail as to the breadth of activities, although it cannot assess their impact. In analysing the documents, activities have been categorised and grouped for the most part according to the Ten Essentials checklist.

Chapter 5 of the report considers how cities and smaller urban centres can identify and measure different aspects of resilience, what types of indicators can be used and the process for measurement. It draws on a range of current literature about measuring resilience, as well as literature on urban governance. It also draws on responses from the interviews on what they interviewees considered have been the main milestones for achieving resilience in their cities.

## Annex 1C. Questionnaire for Mayors and City Officials

### Background

- What city do you represent?
- What is your department and position?

### Resilience-building activities

- Why did you join the campaign?
- Please provide details about specific initiatives/activities/programmes that your city has undertaken to reduce the impact of hazards or disasters. For each activity, please provide the following information:
  - a. Details about the name (where relevant), aims, nature and location of the project
  - b. Source(s) of financial support for the project
  - c. Whether the project has been associated with any organisational changes e.g. changes in legislation, disaster risk reduction guidelines or budgets
  - d. Who has taken the lead for this project
  - e. Which other stakeholders have been involved in the project (including different government departments, agencies, NGOs, private sector partners, community groups, etc.)
  - f. Whether any similar projects are planned for the future (and brief details of these)
  - g. Where we can find further sources of information or documentation about this

- What has been the involvement of the private sector in these risk reduction initiatives/ activities/programmes?
- What has been the level of community participation in these activities? Please describe how you have engaged with communities.

### Impacts of the campaign

- Have you found the ten essentials to be a useful framework in reducing risk in your city? In what ways?
- What level of support has your city received from national government?
  - a. What form has this support taken?
  - b. What are the advantages and difficulties in your city's relationship with national government?
- Has your city completed the UN-ISDR's Local Government Self-Assessment Tool? If so, do you know if this has been fed into the national-level reporting for the Hyogo Framework for Action?
- Do you work with other cities [e.g. partnerships, knowledge-sharing]?
  - a. If so, which ones? How have you worked together?
  - b. Would you like to build stronger links with other cities (both national and international) and why?

### Resilience outcomes

- How successful do you think resilience-building has been in your city so far?
  - a. How has this success been proven?
  - b. Have any monitoring or measuring techniques been used [please describe]?
- What have been the three most significant 'moments', activities or events that have represented steps forward in your city's resilience?
- What have been the three key ingredients for successful risk reduction in your city?

### Challenges and the future

- What are the main challenges that you have faced?
  - a. Have these been overcome? How?
  - b. Are there any remaining capacity problems? What is needed to increase capacity?
  - c. What would be your advice to cities that have **not taken action yet**?

## Annex 2 Terminology

### Adaptation

The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities [United Nations Framework Convention on Climate Change - UNFCCC]. This definition addresses the concerns of climate change. Many disaster risk reduction measures can directly contribute to better adaptation.

### Disaster

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences.

### Disaster Risk Management (DRM)

Disaster risk management is the systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities to lessen the adverse impacts of hazards and the possibility of disaster. It aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.

### Disaster Risk Reduction (DRR)

Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events [guided by the global policy set out in the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters].

### Exposure

People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

### Mitigation

The lessening or limitation of the adverse impacts of hazards and related disasters. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness. [Note that in climate change policy, “mitigation” is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change].

### Natural Hazard

Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage. Natural hazard can be classified according to their geological, hydrometeorological or biological origin and characterized by their magnitude or intensity, speed of onset, duration, and area of extent. For example, earthquakes have short durations and usually affect a relatively small region, whereas droughts are slow to develop and fade away and often affect large regions. In some cases hazards may be coupled, as in the flood caused by a hurricane or the tsunami that is created by an earthquake. [Note: Natural hazards are a sub-set of all hazards, although for the purpose of this report the terms ‘hazard’ and ‘natural hazard’ are used to denote the same thing.]

### Preparedness

The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. The related term “readiness” describes the ability to quickly and appropriately respond when required.

### Recovery

The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.



## Resilience

Resilience means the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of the hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR). Resilience focuses investment on increasing a city area's overall ability to support a vibrant, healthy society and economy under a wide range of circumstances (ICLEI).

## Risk

Risk is the combination of the probability of an event and its negative consequences. Risk is the product of both the degree of exposure to a hazard and the sensitivity of the affected population (i.e. their vulnerability) to that particular hazard.

## Sustainable development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (1987 Brundtland Commission). Disaster risk is associated with unsustainable elements of development such as environmental degradation, while conversely disaster risk reduction can contribute to the achievement of sustainable development, through reduced losses and improved social, environmental and economic development practices.

## Sustainable urban development

Sustainable urban development is the spatial physical manifestation of urban development processes that creates a built environment with norms, institutions and governance systems enabling individuals, households and societies to maximize their potential, optimize a vast range of services so that homes and dynamic neighbourhoods, cities and towns are planned, built, renewed and consolidated restraining adverse impacts on the environment while safeguarding the quality of life, needs and livelihood of its present and future populations (UN-Habitat).

## Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. (There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest [community, system or asset] which is independent of its exposure. However, in common use the word is often used more broadly to include the element's exposure.)

**See more terms at:**  
[www.unisdr.org/terminology](http://www.unisdr.org/terminology)

## Annex 3

# Local Government Self-Assessment Tool for Disaster Resilience

### Why use the Local Government Self-Assessment Tool?

Using the Local Government Self-Assessment Tool will help to set baselines, identify gaps, plan actions and have comparable data across local governments, within the country and globally, to measure advancements over time. By using this universal tool, through a multi-stakeholder consultation, cities and local governments can argue for priority setting and budget allocations within the city council and with the national government.

Online Local Government Self-Assessment Tool: The online HFA monitoring system is hosted on the website [www.prevention-web.net/english/hyogo/hfa-monitoring](http://www.prevention-web.net/english/hyogo/hfa-monitoring). It can also be accessed through the Campaign website [www.unisdr.org/campaign](http://www.unisdr.org/campaign). Access to the online system requires a registration process, facilitated by the UNISDR regional offices and the respective national focal point for disaster risk reduction. Each local government user will be provided a unique user ID and password to access the system. Detailed guidelines on the local government self assessment tool are also available online.

### TABLE A.1: Scoring Scale - Level of Progress

The status and level of progress in the self-assessment shall be measured on a scale of 1-5, which will help score progress over time. More guidance is available online.

LEVEL OF PROGRESS	DESCRIPTION OF LEVEL OF PROGRESS FOR OVERALL RANKING FOR EACH QUESTION [add narrative comments on context and challenges]
5	Comprehensive achievement has been attained, with the commitment and capacities to sustain efforts at all levels.
4	Substantial achievement has been attained, but with some recognised deficiencies in commitment, financial resources or operational capacities.
3	There is some institutional commitment and capacities to achieving DRR, but progress is not comprehensive or substantial.
2	Achievements have been made but are incomplete, and while improvements are planned, the commitment and capacities are limited.
1	Achievements are minor and there are few signs of planning or forward action to improve the situation.

**Table A.2:**

**Key Questions for Self-Assessment based on the “Ten Essentials for Making Cities Resilient”**

The column “Ten Essentials” includes the number(s) of the HFA priority(ies) to which each Essential corresponds. The numbers following each “Key Question” in this table [i.e.: 1.1] point to the corresponding HFA Core Indicators in table A.3. The full system—aligning “key questions” and “core indicators”—is available online, with additional guidelines.

TEN ESSENTIALS	KEY QUESTIONS PER ESSENTIAL [Numbers following each question indicate references to HFA Core Indicators]
<p><b>ESSENTIAL 1:</b></p> <p>Put in place organization and coordination to clarify everyone’s roles and responsibilities</p> <p>[HFA PRIORITY 1]</p>	<ol style="list-style-type: none"> <li>1. How well are local organizations (including local government) equipped with capacities [knowledge, experience, official mandate] for disaster risk reduction and climate change adaptation? [1.1]</li> <li>2. To what extent do partnerships exist between communities, private sector and local authorities to reduce risk? [1.1]</li> <li>3. How much does the local government support vulnerable local communities (particularly women, elderly, infirmed, children) to actively participate in risk reduction decision making, policy making, planning and implementation processes? [1.3]</li> <li>4. To what extent does the local government participate in national DRR planning? [1.4]</li> <li>5. To what extent does the local government have access to adequate financial resources to carry out risk reduction activities? [1.2]</li> </ol>
<p><b>ESSENTIAL 2:</b></p> <p>Assign a budget and provide incentives for homeowners, low-income families and the private sector to invest in risk reduction</p> <p>[HFA PRIORITIES 1 AND 4]</p>	<ol style="list-style-type: none"> <li>6. To what degree does the local government allocate sufficient financial resources to carry out DRR activities, including effective disaster response and recovery? [1.2]</li> <li>7. What is the scope of financial services [e.g. saving and credit schemes, macro and micro-insurance] available to vulnerable and marginalised households for pre-disaster times? [4.2]</li> <li>8. To what extent are microfinancing, cash aid, soft loans, loan guarantees, etc. available to affected households after disasters to restart livelihoods? [4.2]</li> <li>9. How well established are economic incentives for investing in disaster risk reduction for households and businesses [e.g. reduced insurance premiums for households, tax holidays for businesses]? [4.3]</li> <li>10. To what extent do local business associations, such as chambers of commerce and similar, support efforts of small enterprises for business continuity during and after disasters? [4.3]</li> </ol>
<p><b>ESSENTIAL 3:</b></p> <p>Update data on hazards and vulnerabilities, prepare and share risk assessments</p> <p>[HFA PRIORITIES 2 and 3 AND 4]</p>	<ol style="list-style-type: none"> <li>11. To what degree does the local government conduct thorough disaster risk assessments for key vulnerable development sectors in your local authority? [2.1]</li> <li>12. To what extent are these risk assessments regularly updated, e.g. annually or on a bi-annual basis? [2.1]</li> <li>13. How regularly does the local government communicate to the community information on local hazard trends and risk reduction measures [e.g. using a Risk Communications Plan], including early warnings of likely hazard impact? [3.1]</li> <li>14. How well are local government risk assessments linked to, and supportive of, risk assessments from neighbouring local authorities and state or provincial government risk management plans? [2.4]</li> <li>15. How well are disaster risk assessments incorporated into all relevant local development planning on a consistent basis? [2.1]</li> </ol>
<p><b>ESSENTIAL 4:</b></p> <p>Invest in and maintain risk reducing infrastructure, such as storm drainage</p> <p>[HFA PRIORITIES 4]</p>	<ol style="list-style-type: none"> <li>16. How far do land use policies and planning regulations for housing and development infrastructure take current and projected disaster risk (including climate related risks) into account? [4.1] <ul style="list-style-type: none"> <li>• housing</li> <li>• communication</li> <li>• transportation</li> <li>• energy</li> </ul> </li> <li>17. How adequately are critical public facilities and infrastructure located in high-risk areas assessed for all hazard risks and safety? [4.4]</li> <li>18. How adequate are the measures being taken to protect critical public facilities and infrastructure from damage during disasters? [4.4]</li> </ol>



<p><b>ESSENTIAL 5:</b></p> <p>Assess the safety of all schools and health facilities and upgrade these as necessary</p> <p>[HFA PRIORITIES 2, 4 AND 5]</p>	<p>19. To what extent have local schools, hospitals and health facilities received special attention for “all hazard” risk assessments in your local authority? [2.1]</p> <p><b>Tick boxes:</b> Schools Hospitals/ health facilities</p>
	<p>20. How safe are all main schools, hospitals and health facilities from disasters so that they have the ability to remain operational during emergencies [2.1]</p> <p><b>Tick boxes:</b> Schools Hospitals/ health facilities</p>
	<p>21. To what degree do local government or other levels of government have special programmes in place to regularly assess schools, hospitals and health facilities for maintenance, compliance with building codes, general safety, weather-related risks etc.? [4.6]</p> <p><b>Tick boxes:</b> Schools Hospitals/ health facilities</p>
	<p>22. How far are regular disaster preparedness drills undertaken in schools, hospitals and health facilities?[5.2]</p> <p><b>Tick boxes:</b> Schools Hospitals/ health facilities</p>
<p><b>ESSENTIAL 6:</b></p> <p>Enforce risk compliant building regulations and land use planning, identify safe land for low-income citizens</p> <p>[HFA PRIORITY 4]</p>	<p>23. How well enforced are risk-sensitive land use regulations, building codes, and health and safety codes across all development zones and building types? [4.1]</p>
	<p>24. How strong are existing regulations (e.g. land use plans, building codes, etc.) to support disaster risk reduction in your local authority? [4.1]</p>
<p><b>ESSENTIAL 7:</b></p> <p>Ensure education programmes and training on disaster risk reduction are in place in schools and communities</p> <p>[HFA PRIORITIES 1, 3 AND 5]</p>	<p>25. How regularly does the local government conduct awareness-building or education programmes on DRR and disaster preparedness for local communities? [1.3]</p> <p>Tick boxes: programmes include cultural diversity issues programmes are sensitive to gender perspectives</p>
	<p>26. To what extent does the local government provide training in risk reduction for local officials and community leaders? [1.3]</p>
	<p>27. To what degree do local schools and colleges include courses, education or training in disaster risk reduction [including climate-related risks] as part of the educational curriculum? [3.2]</p>
	<p>28. How aware are citizens of evacuation plans or drills for evacuations when necessary? [5.2]</p>
<p><b>ESSENTIAL 8:</b></p> <p>Protect ecosystems and natural buffers to mitigate hazards, adapt to climate change</p> <p>[HFA PRIORITY 4]</p>	<p>29. How well integrated are the DRR policies, strategies and implementation plans of local government into existing environmental development and natural resource management plans? [4.1]</p>
	<p>30. To what degree does the local government support the restoration, protection and sustainable management of ecosystems services? [4.1]</p> <p><b>Tick appropriate boxes:</b></p> <ul style="list-style-type: none"> <li>• forests</li> <li>• coastal zones</li> <li>• wetlands</li> <li>• water resources</li> <li>• river basins</li> <li>• fisheries</li> </ul>
	<p>31. To what degree do civil society organizations and citizens participate in the restoration, protection and sustainable management of ecosystems services? [4.1]</p>
	<p>32. To what degree does the private sector participate in the implementation of environmental and ecosystems management plans in your local authority? [4.1]</p>

<p><b>ESSENTIAL 9:</b></p> <p>Install early warning systems and emergency management capacities</p> <p>[HFA PRIORITIES 2 AND 5]</p>	33. To what degree do local institutions have access to financial reserves to support effective disaster response and early recovery? [5.3]
	34. To what extent are early warning centres established, adequately staffed (or on-call personnel) and well resourced (power back ups, equipment redundancy etc) at all times? [2.3]
	35. How much do warning systems allow for adequate community participation? [2.3]
	36. To what extent does the local government have an emergency operations centre (EOC) and/or an emergency communication system? [5.2]
	37. How regularly are training drills and rehearsals carried out with the participation of relevant government, non-governmental, local leaders and volunteers? [5.2]
<p><b>ESSENTIAL 10:</b></p> <p>Ensure that the needs and participation of the affected population are at the centre of reconstruction</p> <p>[HFA PRIORITIES 4 AND 5]</p>	38. How available are key resources for effective response, such as emergency supplies, emergency shelters, identified evacuation routes and contingency plans at all times? [5.2]
	<p><b>Tick boxes:</b></p> <ul style="list-style-type: none"> <li>• Stockpiles of relief supplies</li> <li>• Emergency shelters</li> <li>• Safe evacuation routes identified</li> <li>• Contingency plan or community disaster preparedness plan for all major hazards</li> </ul>
	39. How much access does the local government have to resources and expertise to assist victims of psycho-social (psychological, emotional) impacts of disasters? [5.3]
	40. How well are disaster risk reduction measures integrated into post-disaster recovery and rehabilitation activities (i.e. build back better, livelihoods rehabilitation)? [4.5]
	41. To what degree does the Contingency Plan (or similar plan) include an outline strategy for post-disaster recovery and reconstruction, including needs assessments and livelihoods rehabilitation? [5.2]

### TABLE A.3: HFA National Core Indicators

Table A.3 presents the Core Indicators of the five action priorities of the Hyogo Framework for Action that national governments use to monitor progress (see more at: [www.preventionweb.net/english/hyogo/hfa-monitoring](http://www.preventionweb.net/english/hyogo/hfa-monitoring)). The right-hand column shows which Key Question from Table A.1 contributes to which of these HFA Core Indicators (these are linked online).

NATIONAL HFA CORE INDICATORS (CI) BY PRIORITY OF ACTION	Local Key Questions [see Table A.1]	
HFA Priority for Action 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation	1, 2, 3, 4	
CI 1.1. National policy and legal framework for disaster risk reduction exists with decentralised responsibilities and capacities at all levels.		
CI 1.2. Dedicated and adequate resources are available to implement disaster risk reduction plans and activities at all administrative levels.		5, 6
CI 1.3. Community participation and decentralisation are ensured through the delegation of authority and resources to local levels.		3, 25, 26
CI 1.4. A national multi-sectoral platform for disaster risk reduction is functioning.	4	
HFA Priority for Action 2: Identify, assess and monitor disaster risks and enhance early warning	11, 12, 15, 19, 20	
CI 2.1. National and local risk assessments based on hazard data and vulnerability information are available and include risk.		
CI 2.2. Systems are in place to monitor, archive and disseminate data on key hazards and vulnerabilities.		

CI 2.3. Early warning systems are in place for all major hazards, with outreach to communities.	34 35
CI 2.4. National and local risk assessments take account of regional and trans-boundary risks, with a view to regional cooperation on risk reduction.	14
HFA Priority for Action 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels	13
CI 3.1. Relevant information on disasters is available and accessible at all levels, to all stakeholders (through networks, development of information sharing systems, etc.).	
CI 3.2. School curricula, education material and relevant trainings include disaster risk reduction and recovery concepts and practices.	27
CI 3.3. Research methods and tools for multi-risk assessments and cost benefit analysis are developed and strengthened.	
CI 3.4. Countrywide public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to urban and rural communities.	
HFA Priority for Action 4: Reduce the underlying risk factors	16, 23, 24, 29, 30, 31
CI 4.1. Disaster risk reduction is an integral objective of environment-related policies and plans, including for land use, natural resource management and adaptation to climate change.	32
CI 4.2. Social development policies and plans are being implemented to reduce the vulnerability of populations most at risk.	7, 8
CI 4.3. Economic and productive sectoral policies and plans have been implemented to reduce the vulnerability of economic activities.	9 10
CI 4.4. Planning and management of human settlements incorporate disaster risk reduction elements, including enforcement of building codes.	17, 18
HFA Priority for Action 5: Strengthen disaster preparedness for effective response at all levels	
CI 5.1. Strong policy, technical and institutional capacities and mechanisms for disaster risk management, with a disaster risk reduction perspective, are in place.	1
CI 5.2. Disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programmes.	22, 28, 36, 37, 38, 41
CI 5.3. Financial reserves and contingency mechanisms are in place to support effective response and recovery when required.	33, 39
CI 5.4. Procedures are in place to exchange relevant information during hazard events and disasters, and to undertake post-event reviews.	

## Annex 4

### Summary of activities from cities featured

ESSENTIAL	HFA LOCAL INDICATORS	CITY ACTIVITIES
<p><b>1</b> Put in place organization and coordination to clarify everyone's roles and responsibilities</p>	<p>How well are local organizations (including local government) equipped with capacities (knowledge, experience, official mandate) for disaster risk reduction and climate change adaptation?</p>	<p>Makassar, Indonesia: has a Disaster Management Agency (BNPB) to command all DRR efforts and coordinate between government department</p> <p>Bhubaneswar, India: set up DRR institutions at city and ward level</p> <p>Albay, Philippines: has central coordinating office for disaster preparedness, response and recovery</p> <p>Makati, Philippines: City-level DRM council has Barangay-level operating arms</p> <p>Quezon, Philippines: City-level DRM council has Barangay-level operating arms</p> <p>Dubai, UAE: creation of Crisis and Disaster Management team; developed measurements of departmental readiness</p>
	<p>To what extent do partnerships exist between communities, private sector and local authorities to reduce risk?</p>	<p>Dubai, UAE: Crisis and Disaster Management team has representation from all major utilities and agencies</p> <p>San Francisco, Philippines: Purok structure for DRM (below Barangays) allows for participatory risk governance</p> <p>Colombo, Sri Lanka: task force for all actors involved in flood mitigation</p> <p>Pune, India: flood risk reduction managed jointly by municipal government departments and citizen groups</p> <p>Cape Town, South Africa: multi-stakeholder input to DRM plans (dialogue facilitated by LG-SAT); school awareness programmes in partnership with arts NGO</p> <p>Johannesburg, South Africa: multi-stakeholder dialogue facilitated by LG-SAT</p> <p>Overstrand, South Africa: partnership between government, NGOs and communities in 'Working for Water' programme</p> <p>Albay, Philippines: consultation of scientific experts in risk planning</p> <p>Kisumu, Kenya; Mumbai, India; Istanbul, Turkey; Makati City, Philippines; Dubai, UAE: multi-lateral and bi-lateral support for DRM activities</p> <p>Makassar, Indonesia: NGOs involved in community development projects; school preparedness programme delivered in partnership with Indonesian Red Cross</p> <p>Makati, Philippines: NGO partnership for squatter relocation programme; partnership with Philippine Institute of volcanology and Seismology, and Kyoto University, Japan; first response training delivered in partnership with Philippine Red Cross</p> <p>Kisumu, Kenya: NGO partnership provided direct funding for DRR</p> <p>Batticaloa, Sri Lanka: NGO partnership supporting development activities; partnership with University of Salford</p> <p>Cape Town, South Africa; Makassar, Indonesia; Makati, Philippines: CSR used for DRR and disaster recovery</p> <p>Chacao, Venezuela: network of 33 companies in risk management network</p> <p>Tyrol, Austria: partnership with alpS Centre for Climate Change Adaptation Technologies to facilitate DRM planning</p>
	<p>How much does the local government support vulnerable local communities (particularly women, elderly, infirmed, children) to actively participate in risk reduction decision making, policy making, planning and implementation processes?</p>	<p>Santa Tecla, El Salvador: citizen round tables fed into 10-year development plan</p> <p>Makati, Philippines: citizen participation in city planning</p> <p>Thimphu, Bhutan: public consultations held for 25 year Structure Plan</p> <p>Albay, Philippines: community contributes to local risk mapping; community-based early warning system</p> <p>Tyrol, Austria: risk assessment combined expert and community knowledge</p> <p>North Vancouver, Canada: local volunteer task forces identify 'risk tolerance criteria', used in city DRR activity prioritisation</p> <p>Bhubaneswar, India: volunteer residents trained in emergency response</p> <p>San Francisco, USA: Neighbourhood Empowerment Network conducts community consultations</p> <p>Quezon, Philippines: 'walk the fault' participatory risk mapping</p>

	<p>To what extent does the local government participate in national DRR planning?</p>	<p>Albay, Philippines: climate change practices at province-level fed into national policy design</p>
<p><b>2</b> Assign a budget and provide incentives for homeowners, low-income families and the private sector to invest in risk reduction</p>	<p>To what extent does the local government have access to adequate financial resources to carry out risk reduction activities?</p>	<p>Cape Town, South Africa: local governments bid for national allocation for DRR projects; relief funds available from national government when disaster is declared</p> <p>Colombo, Sri Lanka: national government provides funds for flood control in Colombo</p> <p>Philippines: national legislation mandates provincial budget for DRR</p> <p>San Francisco, Philippines: funding from Plan International (Philippines branch)</p> <p>Makassar, Indonesia: assistance from NGOs such as SWASH Care, Global Hope, Ford Foundation and Peduli Negeri Foundation</p> <p>Kisumu, Kenya: all DRR funding comes from ActionAid (NGO)</p> <p>Pakistan: all DRR projects implemented directly by donors and NGOs</p> <p>Makati, Philippines: funding from German government's Federal Foreign Office</p> <p>Makati, Philippines; Bangkok, Thailand; Istanbul, Turkey: funding and technical assistance from JICA</p> <p>Mumbai, India: support for construction of evacuation shelters by World Bank</p>
	<p>To what degree does the local government allocate sufficient financial resources to carry out DRR activities, including effective disaster response and recovery?</p>	<p>Beirut, Lebanon: special budget for DRR allocated by municipal government</p> <p>Cairns, Australia: city allocates annual operating budget for DRM agencies</p> <p>Quito, Ecuador: all municipal departments allocate some budget for DRR</p> <p>Makassar, Indonesia; Colombo, Sri Lanka: specific budget allocation for DRR</p>
	<p>What is the scope of financial services [e.g. saving and credit schemes, macro and micro-insurance] available to vulnerable and marginalised households for pre-disaster times?</p>	<p>San Francisco, Philippines: Purok 'capital build up' programme acts as community resource/capital pool for DRR and emergency capital</p> <p>Makati, Philippines: Universal Health Insurance Coverage for Makati constituents</p>
	<p>To what extent are microfinancing, cash aid, soft loans, loan guarantees, etc. available to affected households after disasters to restart livelihoods?</p>	<p>Thimphu, Bhutan: King awards grants to worst affected families to relieve personal loss following a disaster</p> <p>Makati, Philippines: emergency loans available to households post-disaster</p>
	<p>How well established are economic incentives for investing in disaster risk reduction for households and businesses [e.g. reduced insurance premiums for households, tax holidays for businesses]?</p>	<p>San Francisco, Philippines: financial incentives for effective community (Purok) resilience-building activities</p>
	<p>To what extent do local business associations, such as chambers of commerce and similar, support efforts of small enterprises for business continuity during and after disasters?</p>	<p>Siquirres, Costa Rica; Cape Town, South Africa and San Francisco, Philippines: donated resources or expertise for DRR</p>

<p><b>3</b> Update data on hazards and vulnerabilities, prepare and share risk assessments</p>	<p>To what degree does the local government conduct thorough disaster risk assessments for key vulnerable development sectors in your local authority?</p>	<p>Cape Town, South Africa; Johannesburg, South Africa; Quito, Ecuador; Albay, Philippines: detailed risk assessment undertaken</p> <p>Quezon, Philippines: 'walk the fault' participatory risk mapping</p>
	<p>To what extent are these risk assessments regularly updated, e.g. annually or on a bi-annual basis?</p>	<p>Bhubaneswar, India: regular community risk assessment institutionalised at ward level</p>
	<p>How regularly does the local government communicate to the community information on local hazard trends and risk reduction measures (e.g. using a Risk Communications Plan), including early warnings of likely hazard impact?</p>	<p>Makati, Philippines: monthly publication of printed materials, weekly radio programme featuring discussion about DRM</p> <p>Cape Town, South Africa: dissemination of printed materials</p> <p>Saijo City, Japan: distribution of hazard booklets in public spaces</p> <p>Makati, Philippines: dedicated DRR radio programme</p> <p>Makassar, Indonesia: DRM website</p> <p>See also essential 7</p>
	<p>How well are local government risk assessments linked to, and supportive of, risk assessments from neighbouring local authorities and state or provincial government risk management plans?</p>	<p>Quezon, Philippines: part of Alliance of Seven cities/municipalities to manage regional flood risk</p> <p>Jakarta, Indonesia: has regional coordinating board for watershed management</p>
	<p>How well are disaster risk assessments incorporated into all relevant local development planning on a consistent basis?</p>	<p>Johannesburg, South Africa: vulnerability and risk assessment fed into Comprehensive Disaster Management Plan</p> <p>Cape Town, South Africa: Comprehensive Disaster Risk Assessment feeds into strategic planning</p> <p>San Francisco, Philippines: 2008 risk assessment became basis for priority planning</p> <p>Pune, India: flood risk maps used to prioritise structural and planning measures</p>
<p><b>4</b> Invest in and maintain risk reducing infrastructure, such as storm drainage</p>	<p>How far do land use policies and planning regulations for housing and development infrastructure take current and projected disaster risk (including climate related risks) into account?</p>	<p>Albay, Philippines; Makati, Philippines ; Colombo, Sri Lanka; Mumbai, India; Bangkok, Thailand; Cairns, Australia; Thimpu, Bhutan; Kisumu, Kenya: undertaking activities to improve the capacity of drains and control of flood waters</p> <p>Siquirres, Costa Rica: small-scale, high-impact structural interventions – concrete embankments and drain enlargement</p> <p>Colombo, Sri Lanka: removal of unauthorised structures on drains and canal embankments; tree pruning</p> <p>Moshi, Tanzania: installation of fire hydrants around the city</p> <p>Mumbai, India: construction of cyclone shelters</p> <p>Kampala, Uganda: resettlement of wetland encroachers</p> <p>Makassar, Indonesia; Cape Town, South Africa; Mumbai, India; Kisumu, Kenya; Moshi, Tanzania: slum upgrading programmes</p>
	<p>How adequately are critical public facilities and infrastructure located in high-risk areas assessed for all hazard risks and safety?</p>	<p>See essentials 5 and 6</p>

	How adequate are the measures being taken to protect critical public facilities and infrastructure from damage during disasters?	See essentials 5 and 6
5	Assess the safety of all schools and health facilities and upgrade these as necessary	<p>To what extent have local schools, hospitals and health facilities received special attention for "all hazard" risk assessments in your local authority?</p> <p>Makassar, Indonesia: safe schools prioritised in DRR strategy Kampala, Uganda: windbreaker trees planted outside schools</p>
	How safe are all main schools, hospitals and health facilities from disasters so that they have the ability to remain operational during emergencies	Makati, Philippines; Cape Town, South Africa; Quito, Ecuador; Makassar, Indonesia; Cairns, Australia: all have undertaken school and hospital safety assessments
	To what degree do local government or other levels of government have special programmes in place to regularly assess schools, hospitals and health facilities for maintenance, compliance with building codes, general safety, weather-related risks etc.?	<p>Makati, Philippines: Hospital Safety Index designed to assess all hospitals</p> <p>Cape Town, South Africa: Safer Schools Programme has trained 'high risk' school clusters to formulate emergency plans; mandatory safety inspections of schools by Health and Safety Committee.</p> <p>Quito, Ecuador: LG conducting structural studies of schools and essential city buildings against seismic hazards</p>
	How far are regular disaster preparedness drills undertaken in schools, hospitals and health facilities?	See essential 9
6	Enforce risk compliant building regulations and land use planning, identify safe land for low-income citizens	<p>Makati, Philippines: annual inspections to ensure National Building Code compliance</p> <p>Bhubaneswar, India: enforcement enabled by training building professionals</p>
	How strong are existing regulations (e.g. land use plans, building codes, etc.) to support disaster risk reduction in your local authority?	<p>Bhubaneswar, India: updated planning by-laws in line with risk assessment</p> <p>Quito, Ecuador: developing risk sensitive land use planning</p> <p>Makati, Philippines; Makassar, Indonesia: any development in high-risk area requires environmental compliance certificate</p> <p>Makati, Philippines: risk sensitive land use plan in place</p> <p>Albay, Philippines: supported 18 municipalities in preparing Comprehensive Land Use Plans</p> <p>Cairns, Australia: linking of urban plans and DRM through planning guidance codes</p> <p>Cape Town, South Africa: by-law in place to enforce Coastal Protection zone</p> <p>Istanbul, Turkey: Earthquake Master Plan</p> <p>Albay, Philippines; Makati, Philippines; San Francisco, Philippines; Quito, Ecuador: relocation programmes</p>

**7** Ensure education programmes and training on DRR are in place in schools and communities

How regularly does the local government conduct awareness-building or education programmes on DRR and disaster preparedness for local communities?	<p>Quezon, Philippines; Albay, Philippines; Makati, Philippines: regular community trainings held in first response, community preparedness</p> <p>Kisumu, Kenya: community awareness events supported by JICA and local NGOs/ agencies</p> <p>Cairns, Australia: annual cyclone awareness campaign</p> <p>Kisumu, Kenya: local competition in first aid to raise awareness</p> <p>South Africa; Philippines: celebration of world DR day</p> <p>Nepal; Japan: national celebration of significant disaster events</p> <p>Cape Town, South Africa; San Francisco, Philippines: community theatre programmes to raise awareness</p> <p>Albay, Philippines: DRR mural painting competitions</p>
To what extent does the local government provide training in risk reduction for local officials and community leaders?	<p>Bhubaneswar, India; Batticaloa, Sri Lanka: training of building professionals</p> <p>Makati, Philippines: local officials targeted by risk education</p>
To what degree do local schools and colleges include courses, education or training in disaster risk reduction (including climate-related risks) as part of the educational curriculum?	<p>Cairns, Australia; Saijo City, Japan; Cape Town, South Africa: risk reduction incorporated into school curriculum</p> <p>Colombo, Sri Lanka; Quito, Ecuador; Chacao, Venezuela: risk education incorporated into environmental education</p> <p>Albay, Philippines: climate change education included in school curriculum</p>
How aware are citizens of evacuation plans or drills for evacuations when necessary?	Unknown

**8** Protect ecosystems and natural buffers to mitigate hazards, adapt to climate change

How well integrated are the DRR policies, strategies and implementation plans of local government into existing environmental development and natural resource management plans?	<p>Albay, Philippines; San Francisco, Philippines; Makassar, Indonesia: mangrove planting and rehabilitation for coastal protection</p> <p>Cape Town, South Africa: sand dune reinforcement</p> <p>Pune, India: afforestation to reduce flood risk; ecologically sensitive construction of mitigating infrastructures</p> <p>Saijo, Japan: construction of dams using sustainably forested timber</p> <p>Quito, Ecuador: slope protection to reduce landslide risk</p> <p>Overstrand, South Africa: 'working for water' programme reduces risk and promotes biodiversity</p> <p>San Francisco, Philippines; Albay, Philippines: sustainable livelihoods programmes</p> <p>Quito, Ecuador; Cape Town, South Africa; Johannesburg, South Africa, Durban, South Africa; Bangkok, Thailand; Albay, Philippines; Bhubaneswar, India: climate change mitigation and adaptation strategies</p>
To what degree does the local government support the restoration, protection and sustainable management of ecosystems services?	See above
To what degree do civil society organizations and citizens participate in the restoration, protection and sustainable management of ecosystems services?	<p>Makati City, Philippines; Makassar, Indonesia; Bangkok, Thailand: participatory solid waste management programmes</p> <p>Overstrand, South Africa: public participation in 'working for water' programme (clearing alien plant species)</p>



	To what degree does the private sector participate in the implementation of environmental and ecosystems management plans in your local authority?	None found	
9	Install early warning systems and emergency management capacities	To what degree do local institutions have access to financial reserves to support effective disaster response and early recovery?	Cape Town, South Africa: resources for disaster response from central government Cairns, Australia: all three levels of government provide funding for recovery; recovery aided by multi-stakeholder community support sub-committee Colombo, Sri Lanka: Public Assistance Department of municipal council funds relief services Makassar, Indonesia; Albay, Philippines: multi-stakeholder framework for recovery
		To what extent are early warning centres established, adequately staffed (or on-call personnel) and well resourced (power back-ups, equipment redundancy etc) at all times?	Chacao, Venezuela; North Vancouver, Canada; Pune, India; San Francisco, Philippines: recently upgraded early warning networks Mumbai, India: 35 automatic weather gauging stations Ancona, Italy: sophisticated slope monitoring technology (landslides) Baofeng, China: leadership group for meteorological monitoring established during flood season Albay, Philippines: computer modelling technologies for hazard monitoring
		How much do warning systems allow for adequate community participation?	Ancona, Italy; Albay, Philippines: community participation in hazard monitoring
		To what extent does the local government have an emergency operations centre (EOC) and/or an emergency communication system?	Makati, Philippines: Central coordination of early warning and emergency response is undertaken by the Makati Command, Control and Communications Centre (C3) Colombo, Sri Lanka: public assistance department provides relief services Makassar, Indonesia: Emergency Response Unit; fast response team undertakes rapid assessment on behalf of Disaster Management Agency Cairns, Australia: State Emergency Services volunteers participate in emergency response; public warnings via landline telephones through National Emergency Warning System Chacao, Venezuela: hazard warning information available live online to public Siquirres, Costa Rica: national government policy requires all local governments to have an Emergency Committee for disaster response Albay, Philippines: dissemination of early warnings via distributed SIM cards to village officials San Francisco, USA: Emergency Operations Center (EOC) activated in emergencies Moshi, Tanzania: dissemination of warnings via cars with loudspeakers and local radio stations
		How regularly are training drills and rehearsals carried out with the participation of relevant government, non-governmental, local leaders and volunteers?	Quito, Ecuador; Bhubaneswar, India: regular drills held at all levels of the city Saijo City, Japan: drills held bi-annually since 2007 Cape Town, South Africa: school evacuation drills held regularly Mumbai, India; Dubai, UAE: first full-city drills recently held
		How available are key resources for effective response, such as emergency supplies, emergency shelters, identified evacuation routes and contingency plans at all times?	Albay, Philippines; Kisumu, Kenya: evacuation centres operate as community centres/schools in normal times Baofeng, China; Makassar, Indonesia: stockpiling of food and resources Telica, Nicaragua: maintains an Economic Fund to respond adequately and quickly to an emergency situation

# 10

Ensure that the needs and participation of the affected population are at the centre of reconstruction

<p>How much access does the local government have to resources and expertise to assist victims of psycho-social (psychological, emotional) impacts of disasters?</p>	<p>Pune, India: improvements to social protection            Makati, Philippines: rehabilitative 'cash-for-work' programme for disaster victims            Makassar, Indonesia: repatriation of displaced persons is supported in the local budget            Cape Town, South Africa: trauma centre</p>
<p>How well are disaster risk reduction measures integrated into post-disaster recovery and rehabilitation activities (i.e. build back better, livelihoods rehabilitation)?</p>	<p>Santa Tecla, El Salvador; Chincha, Pisco, Canete and Ica, Peru: long-term development plan was formulated in aftermath of disaster event            Cairns, Australia: District Community Recovery Committee</p>
<p>To what degree does the Contingency Plan (or similar plan) include an outline strategy for post-disaster recovery and reconstruction, including needs assessments and livelihoods rehabilitation?</p>	<p>Albay, Philippines: recovery plans are linked into the provincial Development Plan</p>



Severe monsoon floods, which began in late July 2011, continue to inundate Bangkok and several provinces in Thailand, affecting over 2 million people. An aerial view of floods in Bangkok during a helicopter ride taken by Secretary-General Ban Ki-moon.

## Annex 4

# Making Cities Resilient Campaign Timeline

Below is a list of the most significant events that shaped the results of the campaign. Many other local, national and sub-regional workshops, launch events and trainings took place, led by partners, UNISDR or the cities.

### YEAR 2009

#### 2009 Foundation of the Campaign

**Event:** ISDR Conference Building a Local Government Alliance for DRR  
**Incheon, Republic of Korea 11-12 August 2009**

**Significance:** Opened by UN Secretary-General, Mayor of Incheon and UCLG-ASPAC. Making Cities Resilient Campaign foundation and first Partnership meeting, the Incheon Declaration.

**Event:** Second Campaign Partnership Meeting, hosted by UCLG  
**Barcelona, Spain 23-24 November 2009**

**Significance:** Partnership agreements and Campaign strategy (UCLG, EMI, UN-Habitat, IFRC, UNICEF, CityNet, etc).

**Event:** 5th AFRICITIES Summit, UCLG – Africa  
**Marrakech, Morocco 16 – 20 December 2009**

**Significance:** Session on “Resilient Cities” raised political commitment from Mayors

### YEAR 2010

#### 2010 Campaign launch

**Event:** 5th World Urban Forum – The Urban Divide  
**Rio de Janeiro, Brazil 22-26 March**

**Significance:** Networking session for pre-launch of Campaign, with cities, Norway, EMI, GROOTS (grass-root women) and UN-Habitat

**Event:** ICLEI 1st World Congress on Cities and Adaptation to Climate Change  
**Bonn, Germany 28 - 30 May 2010**

**Significance:** Global Campaign launch. Bonn Declaration of Mayors Adaptation. Local leadership, climate change and disaster resilience. 1st meeting Campaign Advisory Panel.

**Event:** South Asia launch of Making Cities Resilient Campaign (Govt of India, South Asia Association for Regional Cooperation-SAARC, UNISDR)  
**New Delhi, India 8-9 June**

**Significance:** Sub-regional launch of Campaign, 50 cities from Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Draft SAARC policy document for urban risk reduction, planning for follow-up activities in countries.

**Event:** Campaign launch in South America  
**Lima, Peru 10 June**

**Significance:** First launch event among many in the Americas- Spanish

**Event:** Workshop for local elected officials on DRR (UCLG, UNISDR)  
**Dakar, Senegal, 14-15 May 2010**

**Significance:** Awareness on DRR among local governments: Senegal, Congo, Côte d'Ivoire, Mali, Tchad

**Event:** Shanghai World Expo 2010: Better Cities, Better World  
**Shanghai, China July: City Forum on DRR** (DevNet, UNISDR, UN-Habitat, ICLEI)

13 October: Public televised dialogue International Day- at the World Expo UN-Pavilion

**Significance:** 150 participants from cities, academia, private sector shared good practice, discussed city resilience indicators (assessment tool); and recovery.

**2011**  
**750 cities**  
have joined  
the campaign.

**Event:** 46th ISOCARP Congress (International Society of City and Regional Planners)  
**Nairobi, Kenya September 2010**

**Significance:** Introduction to resilience and risk reduction among the planners

**Event:** ICLEI Congress on Future of Cities  
**Incheon, Korea 5-7 October 2010**

**Significance:** Resilient Cities defined for ICLEI 2018 Strategy

**Event:** Southern Africa workshop for local elected leaders on DRR (UCLG, CADRI, UNISDR)  
**Mbabane, Swaziland, 5-6 October 2010**

**Significance:** Awareness increased on DRR for local governments of Swaziland, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zimbabwe

**Event:** UCLG 3rd Congress on World Summit of Local and Regional Leaders  
**Mexico City 16-20 November 2010**

**Significance:** High political leverage among cities, adopted The City of 2030 our Manifesto and future recommendations – including resilient cities.

**Event:** Kick-off for Local HFA, local government self-assessment design (UNISDR with DG-ECHO and Global Network of Civil Societies for DRR)  
Global, started December 2010

**Significance:** Multi stakeholder dialogues in Armenia, Indonesia, Mozambique, Nepal and Peru

## YEAR 2011

**Event:** 3rd Campaign Advisory Panel meeting  
**Kobe, Japan 18 January 2011**

**Significance:** Defined the outline for the Handbook; cities plan for Global Platform 2011

**Event:** 3rd Session of the Global Platform for Disaster Risk Reduction  
**Geneva, Switzerland 8 – 13 May 2011**

**Significance:** A strong Mayor's Statement part of outcome, reinforcing continuation of the Campaign to 2015 and need for decentralized capacities. The UN-Sasakawa Award rewarded innovative DRR in cities; laureates were San Francisco, Cebu (Philippines); Santa Fe (Argentina); North Vancouver (Canada).

**2011**  
**HFA-LGSAT**  
pilot phase  
started.

**Event:** ICLEI 2nd World Congress on Cities and Adaptation to Climate Change  
**Bonn, Germany 3 – 5 June 2011**

**Significance:** Workshop to revise Local Government Self-Assessment Tool and plan 25 cities pilot with ICLEI and GFDRR funds.

**Event:** 2nd World Cities Scientific Development Forum and 1st Mayors' Summit on DRR  
(WCSDA, UNISDR, Chengdu City)

**Chengdu, Sichuan, China 11- 13 August 2011**

**Significance:** Chengdu Declaration of Action: reinforce city-to-city cooperation and learning.

**Event:** European Forum for DRR  
**Skopje, Macedonia, 10 – 12 October 2011**

**Significance:** A regional working group with 10 countries for local DRR and the Campaign was established – has accelerated sign-up and city-to-city cooperation in Europe, chaired by Italy.

**Event:** Local Government Self Assessment Tool Workshop (UNISDR and ICLEI)  
**Incheon, Republic of Korea 20 - 21 October 2011**

**Significance:** 25 representatives of cities and national governments who tested the Local Government Self Assessment Tool evaluated use, modified content and prepared roll-out plan with UNISDR linked to HFA monitoring.

**2011**  
**Partnership Meeting Revised Strategy**

**Event:** Making Cities Resilient Campaign Partnership Meeting  
Geneva, Switzerland, 1 – 2 November 2011

**Significance:** Partners and Role Model Cities took stock of progress and prepared the 2012-2015 strategy for the Making Cities Resilient Campaign

**Event:** Caribbean Forum on Disaster Risk Reduction, Making Caribbean Cities Resilient Workshop (CDEMA, UNISDR)

Trinidad and Tobago 5 Dec 2011

**Significance:** Caribbean Campaign launch, Port of Spain Declaration (with action plan),

**YEAR 2012**

**Event:** European Resilient Forum, Building Cities' Resilience to Disasters: Protecting Cultural Heritage and adapting to climate change

Venice, Italy 19 – 20 March 2012

**Significance:** European mayors, local and national govts with UNISDR, Council of Europe, EC, private sector, UN-Habitat, UNESCO: lessons learnt from Venice; workshop with MARSH on protection of culture heritage. LAUNCH roll-out for HFA-Local Government Self-Assessment Tool

**Event:** FLACMA (regional UCLG) Congress in Latin America

Santiago de Chile, Chile, 20 – 23 March

**Significance:** Mayors' forum, followed by UN-Habitat sponsored training with UNISDR for 14 municipalities in the Bio-Bio region. Pre-launch of the Handbook for Local Government Leaders in Spanish.

**Event:** 22nd Session Congress of Local and Regional Authorities of the Council of Europe  
Strasbourg 20 - 22 March 2012

**Significance:** The substantive Resolution 339 for Making Cities Resilient signed

**Event:** ASEAN Training Course on Urban DRR and Climate Change Adaptation  
Manila, Philippines, 21 – 23 March 2012

**Significance:** Pre-launch of the Handbook for Local Government Leaders in English and presentation of HFA – Local Government Self-Assessment Tool for ASEAN cities

**Event:** ICLEI 3rd Global Forum on Urban Resilience and Adaptation

Bonn, Germany 12 – 15 May 2012

**Significance:** Urban risk forum, lessons learnt; interviews for this Report; Post HFA consultation with local governments; LAUNCH of Handbook for Local Government Leaders: How to Make Cities More Resilient

**Event:** Resilient Cities Webinars (UNISDR, Council for Research and Innovation Building-CIB).

29 May - 2 June 2010

**Significance:** Learning, input for this report, identify issues for further research. Topics: risk reduction and urban planning; multi-stakeholders engagement; procesos de reconstrucción; Local Government Self Assessment Tool. Seven Campaign cities participated with academia and NGOs.

**Event:** Rio+20 World Conference on Sustainable Development

Rio de Janeiro, Brazil 20 – 22 June 2012-08-16

**Significance:** High-level side event on Making Cities Resilient, launch of voluntary commitment. The Future We Want outcome document includes section of Disaster Risk Reduction (with focus on cities and communities).

**Event:** CityNet 25th Anniversary Asia-Pacific Congress

Jakarta, Indonesia 2 – 5 July 2012

**2012**  
**Council of Europe Resolution 339**

**2012**  
**Handbook for Local Government Leaders**

## 2012 Capacity Development Programme

**Significance:** Regional lessons and training on Campaign tools with Asian cities. Post HFA consultation with local governments.

**Event:** 26th Annual Congress of the Association of European Schools of Planning  
Ankara, Turkey 11 – 15 July 2012-08-16

**Significance:** Key note speech on Resilient Cities; networking for resilience planning guidance.

**Event:** 4th International Disaster and Risk Conference (IDRC)  
Davos, Switzerland 26 - 30 August 2012

**Significance:** The Handbook for Local Government Leaders presented in Chinese, Farsi and Spanish.

**Event:** UN-Habitat - World Urban Forum - The urban future  
Naples, Italy 1 – 6 September 2012

**Significance:** Launch of the 1st Resilient Cities Report. Workshop and networking event with experts and cities representatives on "Planning for resilient cities - urban design"

**Event:** Resilient Cities Capacities Development Forum (UNISDR, GETI)  
Incheon, Republic of Korea 19 – 21 September 2012

**Significance:** campaign partners and training providers to review available resources and plan for a Resilient Cities Capacity Development Programme

**Event:** World Cities Scientific Development Alliance (WCSDA), 2nd Forum and Summit  
Beijing, China 29-31 October 2012

**Significance:** Resilient Cities Award by WCSDA; urban planning and resilience, cooperation.



## 2013 Global Platform for DRR

### YEAR 2013

**Event:** Global Platform for DRR  
Geneva, Switzerland 19 – 23 May 2013

**Significance:** The main Global Forum on disaster risk reduction – will focus on investment in risk reduction, panels on local actions, urban risk and Campaign progress; post-2015 HFA.

**Event:** ICLEI 4th Resilient Cities Global Forum  
Bonn, Germany 31 May – 2 June 2013

**Significance:** Urban risk forum and adaptation in cities (focus on solutions and financing)





## The Ten Essentials for Making Cities Resilient Checklist

1. Put in place **organisation and coordination** to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.
2. **Assign a budget** for disaster risk reduction and provide incentives for homeowners, low income families, communities, businesses and the public sector to invest in reducing the risks they face.
3. Maintain up to date data on hazards and vulnerabilities. **Prepare risk assessments** and use these as the basis for urban development plans and decisions, ensure that this information and the plans for your city's resilience are readily available to the public and fully discussed with them.
4. Invest in and maintain **critical infrastructure that reduces risk**, such as flood drainage, adjusted where needed to cope with climate change.
5. Assess the safety of all schools and health facilities and upgrade these as necessary.
6. Apply and enforce **realistic, risk compliant building regulations and land use planning** principles. Identify safe land for low income citizens and upgrade informal settlements, wherever feasible.
7. Ensure that **education programmes and training** on disaster risk reduction are in place in schools and local communities.
8. **Protect ecosystems and natural buffers** to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
9. Install **early warning systems and emergency management capacities** in your city and hold regular public preparedness drills.
10. After any disaster, ensure that the **needs of the affected population are placed at the centre of reconstruction**, with support for them and their community organisations to design and help implement responses, including rebuilding homes and livelihoods.

Sign-up to the Making Cities Resilient Campaign, visit the Campaign website for more information. [www.unisdr.org/campaign/resilientcities](http://www.unisdr.org/campaign/resilientcities)

## **Making Cities Resilient Report 2012**

### **My City is Getting ready! A global snapshot of how local governments reduce disaster risk**

This report is a product of cities' and local governments' efforts to protect their cities and make them safer and productive places to live and work. Today, with more than half of the world's population living in urban areas, building resilience to natural hazards has become a pressing challenge that cannot be ignored.

Although at first glance building resilience may appear to be a daunting challenge for cities and nations worldwide, this report shows that many are already taking important steps to reduce disaster risk by investing in measures that protect infrastructure and strengthening political will, government structures and the capacity of local authorities to drive this process forward, in an effort to safeguard the quality of life and livelihoods of their citizens within a framework of sustainable development.

Their stories—and those of many others—show what can be achieved with strong political leadership [particularly at the local level], where citizens have a voice in shaping a safe future for their cities, and where committed international partnerships and platforms make it possible to share knowledge.

Recognition of the inextricable links among disaster risk reduction, climate change adaptation and sustainable development reveals the critical challenges that still remain. UNISDR and global partners in the Making Cities Resilient Campaign: My City is Getting Ready! will continue to accompany local authorities as they tackle these issues and take action to minimize the impact of natural hazards on those most at risk.