



TRENDS in URBAN RESILIENCE 2017



TRENDS
in **URBAN**
RESILIENCE
2017

Trends in Urban Resilience 2017

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If you wish to contribute to the future editions of this series, or for more information, please contact us at: info@cityresilience.org.

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FOREWORD



Dr Joan Clos

Secretary-General of Habitat III
Under-Secretary-General of the United Nations
Executive Director of UN-Habitat

“Trends in Urban Resilience 2017” is an insightful review of methodologies, approaches, and progress illustrated in case studies, an overview of communities of practice delivering support to cities around the world to achieve their goals of inclusive, safe, resilient and sustainable human settlements.

It gives me great pleasure to present the “Trends in Urban Resilience 2017”, the latest analysis from UN-Habitat on urban resilience. As the leading UN programme on sustainable urbanization with more than forty years of normative and field activities in this area, UN-Habitat has engaged with hundreds of cities and other human settlements struggling with the impact of crisis: from conflict to natural disaster, failures in governance to economic stress, and challenges from unplanned or inadequately planned urbanization, among others. Throughout its engagement, the inherent focus has always been on the consequences of crisis on people, particularly the most vulnerable groups.

The pledge of national governments to consolidate disaster risk reduction by declaring an International Decade for Natural Disaster Reduction beginning January 1990, was echoed in the 2015 Sendai Framework for Disaster Risk Reduction. The experience of previous decades has led to the understanding that disaster risk reduction, at least within cities, is a key element of creating inclusive, safe, resilient and sustainable human settlements. Increasingly, large-scale communities of practice such as the Medellin Collaboration on Urban Resilience – convened and launched by UN-Habitat in 2014 – are integrating risk reduction measures into more strategic and longer-term urban development efforts.

“Trends in Urban Resilience 2017” is an insightful review of methodologies, approaches, and progress illustrated in case studies, an overview of communities of practice delivering support to cities around the world to achieve their goals of inclusive, safe, resilient and sustainable human settlements. The report highlights actions which help cities develop their capacity to absorb the impact of hazards, protect and preserve human life, and limit damage to and destruction of public and private assets, all the while continuing to provide the essential infrastructure and services in the aftermath of a crisis.

UN-Habitat's Urban Resilience Programme recognizes that achieving and maintaining development gains in urban areas is inherently dependent on the city's ability to withstand critical challenges and deficits. The interconnectivity of an urban system encompasses all sectors and must be integrated, and not sectorial. When investments are made sector by sector, asymmetric development patterns emerge, to the detriment of the urban system as a whole. Urbanization is a political, social and environmental process that is not reached by chance but by choice and design.

UN-Habitat is one of many prominent organisations actively supporting local authorities to adopt a holistic approach to making their cities safer and more resilient. To promote awareness among stakeholders and further inspire action, this biennial publication shows how resilient urban development is trending globally.

Urbanization is a political, social and environmental process that is not reached by chance but by choice and design.



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LIST OF ACRONYMS AND ABBREVIATIONS

100RC	100 Resilient Cities
C40	C40 Cities Climate Leadership Group
COP21	21st Conference of the Parties / Paris Climate Change Conference
CRPP	UN-Habitat City Resilience Profiling Programme
CRPT	City Resilience Profiling Tool
DFC	Detroit Future City
DFID	United Kingdom Department for International Development
DG-DEVCO	European Commission Directorate General for International Cooperation and Development
EU	European Union
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
Habitat I and II	First and Second United Nations Conference on Human Settlements
Habitat III	Third United Nations Conference on Housing and Sustainable Urban Development
HFA	Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters
ICLEI	ICLEI - Local Governments for Sustainability (formerly International Council for Local Environmental Initiatives)
IDP	Internally Displaced Person
ISO	International Organization for Standardization
LAC	Latin America and the Caribbean
LGSAT	Local Government Self-Assessment Tool
MENA	Middle East and North Africa
MCRC	Making Cities Resilient Campaign
MCUR	Medellin Collaboration on Urban Resilience
MDG	Millennium Development Goal
NGO	Non-Governmental Organisation
NORCAP	Norwegian Capacity to International Operations
NUA	New Urban Agenda

OECD	Organisation for Economic Co-operation and Development
RAP	Resilience Action Plan
RESCCUE	RESilience to cope with Climate Change in Urban arEas: a multi-sectoral approach focusing on water
SDG	Sustainable Development Goal
Sendai Framework	§Sendai Framework for Disaster Risk Reduction 2015-2030
Sida	Swedish International Development Cooperation Agency
SPRAR	System Protection for Asylum Seekers and Refugees
UfM	Union for the Mediterranean
UN	United Nations
UN-Habitat	United Nations Human Settlements Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNISDR	United Nations International Strategy for Disaster Reduction / United Nations Office for Disaster Risk Reduction
URP	UN-Habitat Urban Resilience Programme
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Over the past decade, resilience has been gaining ever greater prominence in the international development discourse, emerging as one of the core principles of sustainable urban development in the post-MDGs framework. Between 2015 and 2016, resilience featured as an important theme across six major global agendas: notably the Sendai Framework for Disaster Risk Reduction 2015-2030, the Addis Ababa Action Agenda, the Sustainable Development Goals, the Paris Agreement on Climate Change, the World Humanitarian Summit Commitments to Action and the New Urban Agenda. The latter, which was formulated in Quito on occasion of the United Nations Conference on Housing and Sustainable Urban Development (Habitat III – October 2016), and signed by 167 countries, sets the global standard for achievement in sustainable urban development for the next two decades.

The publication's purpose is to account for this unprecedented global momentum for resilience-building from an urban standpoint: inquiring the trends that drive the theory, investigating how these were gradually incorporated in development agendas, mapping the diverse landscape of actors involved, and analysing how this perspective shift can be translated into forward-looking urban policies and practices. As follows, the document is framed across five main chapters.

- Retracing the theoretical evolution of the concept from the late 1960s onwards, **Chapter one** provides a literature review on resilience thinking, according to its engineering, ecological and social-ecological approaches. Throughout this section, urban resilience is presented as a dynamic and inherently contextual concept, the capacity of which depends on the urban system in its entirety; as well as on the interconnections featuring both across city elements and beyond the urban boundaries. Finally, in order to capture this rapidly growing interest in the concept – from a wide array of disciplines – the section concludes with a snapshot of the main standard being set in the urban resilience spectrum.
- With particular attention to the Post-2015 Development Framework, **Chapter two** goes through the major summits and agendas driving the transition from theory to implementation. Firstly, it draws upon the experiences of the Second UN World Conference on Disaster Risk Reduction (Hyogo, 2005), the United Nations Conference on Sustainable Development (or Rio+20, Rio de Janeiro, 2012) and the Millennium Summit (New York, 2000), in order to account for the relevance acquired by resilience in terms of climate change, disaster risk reduction, community cohesion and socio-economic development. Secondly, the six critical steps of the 2030 Agenda for Sustainable Development – the Third UN World Conference on Disaster Risk Reduction (Sendai, 2015), the Third International Conference on Financing for Development (Addis Ababa, 2015), the UN Sustainable Development Summit (New York, 2015), the COP21 Paris Climate Change Conference (Paris, 2015), the World Humanitarian Summit (Istanbul, 2016) and the Third UN Conference on Housing and Sustainable Urban Development (Quito, 2016) – as well as their commitments to action are analysed in more detail.
- **Chapter three** provides a more detailed account on UN-Habitat's commitment to resilience-building, throughout the work of its Urban Resilience Programme (URP). This illustrates the URP's alignment with the aforementioned agendas, its activities – with a particular focus on the City Resilience Profiling Programme (CRPP) – and the projects in which it is directly involved. Also, an array of resilience-oriented case studies from other offices under UN-Habitat's umbrella will be presented.
- As the importance of engaging with a plurality of actors becomes a common thread through various international development agendas, **Chapter four** endeavours to map the diversity of stakeholders participating in this momentum for urban resilience. Public institutions, private companies, non-profit organisations and academic institutes are gathered in a global map of actors, that represents each actor's approach to urban resilience as well as the existing global partnerships on the subject.
- Contrary to previous sections, **Chapter five** envisions a more action-oriented scope and offers a review of eight geographically and thematically balanced case studies, which serve as examples for positive urban practice. Consequently, the scope of this section is to propose a well-assorted array of urban solutions that, drawing upon an interconnected, integrated understanding of human settlements, exhibit a proactive stance towards challenges and a positive determination to turn these into transversal opportunities. The analysed cases of Bossaso (Somalia), Detroit (United States of America), Guayaquil (Ecuador), Johannesburg (South Africa), Kiribati islands, Riace (Italy), Toyama (Japan) and Yakutsk (Russian Federation) will offer a review of context-based strategies that are well aligned with the multi-sectoral, multi-hazard and multi-stakeholder understanding of resilience put forward throughout the text.

INTRODUCTION

“Humanitarian response alone is utterly insufficient. We must establish a solid link between the humanitarian, resilience and development dimensions.”

– Antonio Guterres

Secretary-General of the United Nations
Conference on Syrian Refugee Situation, October 2014



An overview of informal settlement in Port-Au-Prince, Haiti.
© UN-Habitat / Julius Mwelu

As our world becomes predominantly urban, cities are increasingly emerging as the field where the main challenges for sustainable development will and must be tackled.

Collectively, cities are simultaneously responsible for 70% of global GDP, greenhouse gas emissions, and global waste, as well as over 60% of global energy consumption¹. The United Nations estimates that four out of five people will be living in urban areas by the middle of the century. Unprecedented urbanisation trends bring the potential to transform our cities into unique hubs for services, and to fulfil the promise of inclusion and better social and economic opportunities for all. However, if not properly managed and planned, these same trends can put a severe strain on urban systems: unleashing long-term stresses on their basic components and exposing their weaknesses to the disruptive impacts of multiple shocks.

The unabated pace of climate change is increasing both the frequency and intensity of natural hazards and exponentially augmenting the vulnerability of urban areas by producing economic, physical and social disturbances or provoking major waves of population displacement. The latter, whether triggered by rapid urbanisation, natural disasters or armed conflicts, is putting increased pressure not only on housing and infrastructure, but also on the labour market, urban environment and community cohesion amongst others. Such transformations can contribute to the appearance of large areas of urban informality, exacerbated by protracted economic hurdles and consequent social polarisations, and potentially increase vulnerability to urban crises.

Consistent with this context, and amid a growing need to bridge the gap between urbanisation and sustainable growth, in order to turn the former into a driving force for development and inclusivity, ‘resilience building’ has gained greater currency over the last few decades. From its origins in ecological systems thinking, resilience as a concept is rapidly informing and shaping a wide variety of disciplines and actions, including the urban field.

¹ <http://habitat3.org/the-new-urban-agenda>

In 2012, UN-Habitat began its work on urban resilience through the launch of the City Resilience Profiling Programme (CRPP) – now integrated as one ‘pillar’ of the agency-wide Urban Resilience Programme (URP). CRPP provides national and local governments with appropriate tools to profile, assess and monitor the resilience of cities in the face of a wide range of challenges. Over the last five years the CRPP, and henceforth the URP, have been committed to meeting the growing global demand for fostering resilience by actively promoting a comprehensive and integrated urban planning and management approach based on a multi-sectoral, multi-stakeholder and multi-hazard understanding of urban environments.

As our world becomes predominantly urban, cities are increasingly emerging as the field where the main challenges for sustainable development will and must be tackled.

The importance accorded to issues such as risk reduction, disaster prevention and the sustainable development of urban areas by UN-Habitat, other United Nations bodies and partners, has been broadly accompanied by a growing global interest in cities, especially from a resilience perspective.

Such unprecedented momentum for building resilience is coterminous with a perspective shift towards a less sectorial and more holistic understanding of urban environments, an approach that is strongly reflected in the Post-2015 Development Framework. A wider variety of actors, knowledge, expertise and financial resources than ever before are now pooled together in this field.

In the wake of the Third United Nations Conference on Housing and Sustainable Urban Development (or Habitat III, in Quito in October 2016) that charted the global course for the following two decades and placed resilience at the very core of its vision, this publication aims to begin documenting the global momentum for resilience, from an urban standpoint. In doing so, it will deliver a regular review of emerging approaches, best practices, technologies and progress; ensuring proper coverage and recognition of the growing multitude of stakeholders committed to urban resilience from various disciplines.

The Urban Resilience Programme (URP) envisions *Trends in Urban Resilience* as a key publication to record the interdisciplinary debates unfolding around the theme of resilience, analysing adequate resonance with the main development frameworks and translating theory into actionable strategies. Its production will involve a cyclical mapping exercise of projects, actors, partners and multi-sectoral practices that contribute to this community of practice. Conceived as a periodical publication, to be updated on a biennial basis, *Trends in Urban Resilience* is specifically geared to meet this purpose.

The importance accorded to issues such as risk reduction, disaster prevention and the sustainable development of urban areas by UN-Habitat, other United Nations bodies and partners, has been broadly accompanied by a growing global interest in cities, especially from a resilience perspective.



Kiribati Islands threatened by sea level rise.
© Dan Lewis




CHAPTER 1

Urban Resilience: Theoretical Debate



CHAPTER 1

Urban Resilience: Theoretical Debate



As we delve into an urban era where human activities continue to impact the world we live in, cities are emerging as the primary nexus where people and nature meet. They are hubs for service provision and sources of environmental, social and physical impacts. With an increasing majority of the world's population living in urban centres, cities will need to thrive in the face of numerous pressures that challenge the wellbeing of urban residents. Increasing evidence highlights that cities will be threatened by issues relating to housing, energy production, food or water security, climate change, economic uncertainty, urbanisation, social conflict and terrorism among others. Designing and planning for more liveable and sustainable cities provides an opportunity to foster resilience to such environmental, socio-economic and political uncertainty.

1.1 RESILIENCE THINKING OVER TIME

Since its origins in ecological systems thinking in the 1960s and early 1970s, resilience thinking has progressively gained prominence. Owing to the concept's contested definition and malleability, it has developed within and been adapted to a diverse range of disciplines including: engineering, ecology, physics, geography, business management and psychology¹.

With regards to the urban setting, resilience thinking has advanced and been considered along three distinct readings: firstly, a traditional ecological perspective based on the engineering thinking – later labelled the engineering perspective; secondly, a more recent ecological perspective, and thirdly, a social-ecological perspective.

From the engineering perspective, resilience is measured in terms of recovery – the sooner the functionality of a system is restored after being threatened by disturbances, the more resilient that system. This interpretation is linked to the assumption that a system has a single steady-state or equilibrium to which it must return, and thus, the *engineering resilience* approach emphasises the ability and speed a system adopts to bounce back to its original condition after a disturbance². Contrary to this static understanding of systems, from the early 1970s onwards within the ecological discipline, the *ecological resilience* of a system was described as the ability to “absorb changes [...] and still persist”³. Following this approach, the larger the magnitude of a stress or shock a system can absorb without failing completely or crossing a critical threshold and changing its structure into a new equilibrium or steady-state, the greater its resilience.

The qualitative difference between these two interpretations is that, whilst *engineering resilience* considers only one equilibrium and thus merely emphasises the persistence of its state – meaning the ability to remain stable within this single equilibrium – *ecological resilience* recognises that a system can have multiple stable states, which may evolve and change, providing the system remains functional, and therefore values both persistence and adaptability.

This ecological conceptualisation of resilience recognises that a city incorporates varied forms of steadiness and may, thus, transform over time.

Furthermore, from the end of 1970s onwards, social scientists and urban sociologists started recognising that social systems – human settlements – are not isolated systems, but are inextricably linked to each other and to the ecosystems they use and depend on. This thinking led to the development of social-ecological systems (SEs) reasoning⁴. Grounding resilience thinking in this approach led to the development of *social-ecological resilience* which “incorporates the idea of adaptation, learning and self-organization in addition to the general ability to persist disturbance” and thus captures the significance of the human potential to transform its surroundings⁵. Drawing from Carpenter et al.⁶, *social-ecological resilience* can be measured by three primary characteristics:

1. the amount of disturbance a system can absorb and still remain within the same state;
2. the degree to which the system is capable of self-organisation, and;
3. the ability to build and increase the capacity for learning and adaptation.

This approach to resilience further challenges the ‘equilibrium-based’ notion of the engineering and ecological concepts – alternately viewing resilience as a process of evolution or transformation, attempting to turn challenges into opportunities, as it fully recognises that systems are in a state of constant change, even when they are not threatened by disturbances⁷. Scholars have also defined it as a system’s ability to “adjust in the face of changing conditions”, and therefore sometimes refer to social-ecological resilience as *evolutionary resilience*⁸.

1.2 URBAN RESILIENCE

The theory of resilience can also be applied to cities, leading to what is known as urban resilience. Since its origins, the application of resilience within the urban environment has undergone various changes, although this evolution may be more connected to shifting notions of the urban environment itself, rather than from shifts in the definition of resilience. The disturbances that cities face manifest in different ways and, as a result, resilience is an evolving concept. Moreover, being resilient is perceived as desirable and is widely used and applied to different contexts despite there being no consensus on a single definition or universal measure⁹. Framing mechanisms for resilience vary across publications and disciplines and interpretations from governments and organisations are diverse across global, national, municipal and community scales. Resilience is viewed as a process, a state and a quality.

The traditional approach to urban resilience is closely related to the engineering resilience theory according to which, the resilience of a city is directly dependent on “the capability of all the physical components of the system, including buildings and transportation infrastructures, to absorb the damages due to an external shock and to quickly restore their state before the shock”¹⁰. This understanding focuses on tackling any possible tangible challenges whilst attempting to maintain the urban system operational, without major changes disrupting its fabric. The city is seen as a stable entity, and specific (and predictable) disturbances are addressed one at a time as risks are not usually considered directly connected to each other or to social and economic factors inherent to the city’s functioning. The main characteristics of a system are efficiency, constancy, and predictability¹¹.

TABLE 1.1: Analysis of Resilience in Systems Thinking.

	NUMBER OF EQUILIBRIUMS	MEASURE FOR RESILIENCE	NATURE OF DISTURBANCES	EMPHASIS
Engineering resilience	one	speed of return to the single equilibrium	<ul style="list-style-type: none"> - predictable - external - shocks 	<ul style="list-style-type: none"> - resistance and recovery - efficiency, predictability
Ecological resilience	multiple	magnitude of shocks that can be absorbed, before the threshold to enter a new equilibrium is crossed, as well as degree of self-organisation and capacity for learning	<ul style="list-style-type: none"> - predictable and unpredictable - external - shocks 	<ul style="list-style-type: none"> - persistence - adaptability, flexibility - resourcefulness, efficiency, diversity
Social-ecological resilience	none, continuously changing	magnitude of shocks and stresses that are continuously absorbed, as well as advanced degree of self-organisation and capacity for learning by social-ecological systems	<ul style="list-style-type: none"> - predictable and unpredictable - internal and external - shocks and stresses 	<ul style="list-style-type: none"> - persistence - adaptability, flexibility - human potential to transform its surroundings (human agency)

Within this interpretation there is an explicit focus on physical, infrastructural elements of the urban fabric, whilst ignoring non-physical factors such as social capital. Following this vision, governments have employed a techno-scientific and predominantly top-down, managerial approach, determined by the maintenance of a status quo and use of engineered response to threats or shocks within a very defined system¹². Applying the engineering resilience concept to cities can be fundamentally problematic as the static nature of the equilibrium paradigm does not capture the dynamism of cities well.

Although the ecological approach better incorporates flexibility as it recognises the potential for adaptability, it does not yet integrate the interdependency of systems and the consequent continuous change experienced within a system – or a city as a system of systems. Urban sociologists and planners have come to realise that a city not only transitions in the face of sudden shocks, but also incrementally or rapidly adapts to slow-burning stresses¹³. Undoubtedly, priority areas, sectors and hazards will differ from city to city, the temporal and spatial scales at which urban resilience can be applied will therefore vary significantly according to contextual factors¹⁴.

Understanding that cities function as complex, interdependent and integrated social-ecological systems is crucial to understanding how resilience-based planning, development and management can protect life, assets and maintain continuity of functions through any plausible shock or stress. Programmes that deliver resilient healthcare, resilient water supply, resilient companies or resilience to climate change do not enhance a city's overall resilience when addressed separately. Only when viewing the system in its entirety, connected both within and beyond its boundaries, will cities be able to successfully respond to the impacts of economic, social, political or natural events and avoid displacement, inequity, overburdened urban services, or undermined capacity to properly manage cities.

Understanding that cities function as complex, interdependent and integrated social-ecological systems is crucial to understanding how resilience-based planning, development and management can protect life, assets and maintain continuity of functions through any plausible shock or stress.

1.3 EMERGING TRENDS

The discourse and expertise on resilience is evolving. Over the last decade, several books, scholarly journals and academic research across a wide range of disciplines have debated the subject and how it should be embedded within the urban sphere. The vast and growing literature available on urban resilience demonstrates the complexity of the concept as a target, as well as the challenges of mainstreaming recommendations into the urban development practice.

Papers highlight the integrated, multi-level, and multi-stakeholder approach needed to build resilience to a range of shocks and stresses at different levels and scales in complex systems

The prominent trend within academic literature is a focus on governance and policy frameworks that can enhance urban resilience. Papers highlight the integrated, multi-level, and multi-stakeholder approach needed to build resilience to a range of shocks and stresses at different levels and scales in complex systems¹⁵. Recognition is also given to the range of different perspectives, objectives and contexts within a system, and the trade-offs that may be required in planning and policymaking. Furthermore, the academic debate to define resilience and investigate its relationship to core terms and concepts such as vulnerability and sustainability is on-going¹⁶. Within this context, much of the literature focusses on a plethora of shocks and stresses, from natural disasters to civil conflicts. The result is a diverse spectrum of studies questioning the disruptive impacts to food and water security, energy supply, agricultural production, transportation, social inclusion and migration, amongst others.

Research literature produced by governments, international agencies and non-governmental organisations places focus on operational approaches to resilience thinking. Reflecting the different mandates of each institution, these manuscripts are different in scope and diverse in interpretation – reports use varying working definitions and cover varying operational entry and exit points including climate change adaptation and disaster risk reduction as well as more comprehensive development approaches¹⁷. Some of the approaches are further elaborated in chapter three. Overall, the increased inclusion of resilience in the make-up of both academic and practical literature further highlights the general prominence that the concept is acquiring in the domains of international development and cooperation, governance, policy and practice.

Within the development realm there is an emerging trend to produce quantitative tools, indicators and international standards to measure resilience at the urban scale. Many of these initiatives are quite recent – with several currently being developed – and not yet widely available. Nonetheless, with the rising interest and work being conducted within the urban resilience field by a vast array of global actors, it is expected that existing gaps on standardisation will be filled in the coming years.

There is an emerging trend to produce quantitative tools, indicators and international standards to measure resilience at the urban scale



Discussions before the Plenary Session at COP21, Paris, France.
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In 2014, the International Organization for Standardization (ISO, see profile in chapter three) published the ISO 37120 “Sustainable development of communities – Indicators for city services and quality of life” standard. This is the agency’s first attempt to create a common international standard with cities as the central nexus, applicable to any city, municipality or local government regardless of size or location. Furthermore, the 21st Conference of the Parties, also known as the 2015 Paris Climate Change Conference, saw the publication of the Global Infrastructure Basel Foundation’s SuRe standard for Sustainable and Resilient Infrastructure, while the ISO is currently developing the ISO 37121 standard looking at existing guidelines and approaches on both sustainable development and resilient cities. The trend of producing resilience measuring tools is, however, not only being led by international organisations, the private sector is similarly engaging in the development of indicators. As an example, in 2015, the company Lloyd’s developed the City Risk Index.

This overview of the conceptualisation of resilience from a theoretical standpoint, has revealed that resilience is viewed firstly as a framework for thinking, and secondly as an increasingly relevant issue in international development and urban studies. Its gradual assimilation into governmental discourses and publications confirms a general shift towards a more holistic and multi-sectoral understanding of urban challenges, one that acknowledges a plurality of stakeholders, hazards and scales, as well as questions interconnections and interdependencies within and beyond cities. The shift in urban resilience thinking has now taken on a new dimension within the context of the Post-2015 Development Framework, which places new focus on these questions.

Resilience is viewed firstly as a framework for thinking, and secondly as an increasingly relevant issue in international development and urban studies.

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Habitat III in Quito, Ecuador.
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GENERAL

MINISTER OF HOUSING AND URBAN DEVELOPMENT

CHAPTER 2

The Path Towards Resilience: United Nations Global Agendas



CHAPTER 2

The Path Towards Resilience: United Nations Global Agendas

Between 2015 and 2016, resilience featured as a prominent theme across six major global agendas, namely the Sendai Framework, the Addis Ababa Action Agenda, the Sustainable Development Goals, the Paris Agreement, the World Humanitarian Summit Commitments to Action and the New Urban Agenda. The latter was formulated in Quito during the Third United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in October 2016 and was signed by 167 countries, and sets the global standard for sustainable urban development.

2.1 POST-2015 DEVELOPMENT FRAMEWORK

The Post-2015 Development Framework – also referred to as the 2030 Agenda for Sustainable Development – embraces all the international meetings, conferences and frameworks charting the United Nations’ priorities for development over the next fifteen years. The term also mirrors the transition from the Millennium Development Goals (MDGs) – formulated during the UN Millennium Summit of 2000 – to the Sustainable Development Goals (SDGs) – defined in New York in September 2015 – as well as an overall focus on resilience, risk prevention, sustainability and climate change. The Third United

Nations World Conference on Disaster Risk Reduction (Sendai, March 2015), the Third International Conference on Financing for Development (Addis Ababa, July 2015), the United Nations Sustainable Development Summit (New York, September 2015), the 21st Conference of the Parties (COP21, Paris, December 2015), the World Humanitarian Summit (Istanbul, May 2016) and the Third Conference on Housing and Sustainable Urban Development (or Habitat III, Quito, October 2016) have all contributed to define critical milestones of the Post-2015 Development Framework¹.

MAP 2.1: 6 Conferences and Summits of the Post-2015 Development Framework.

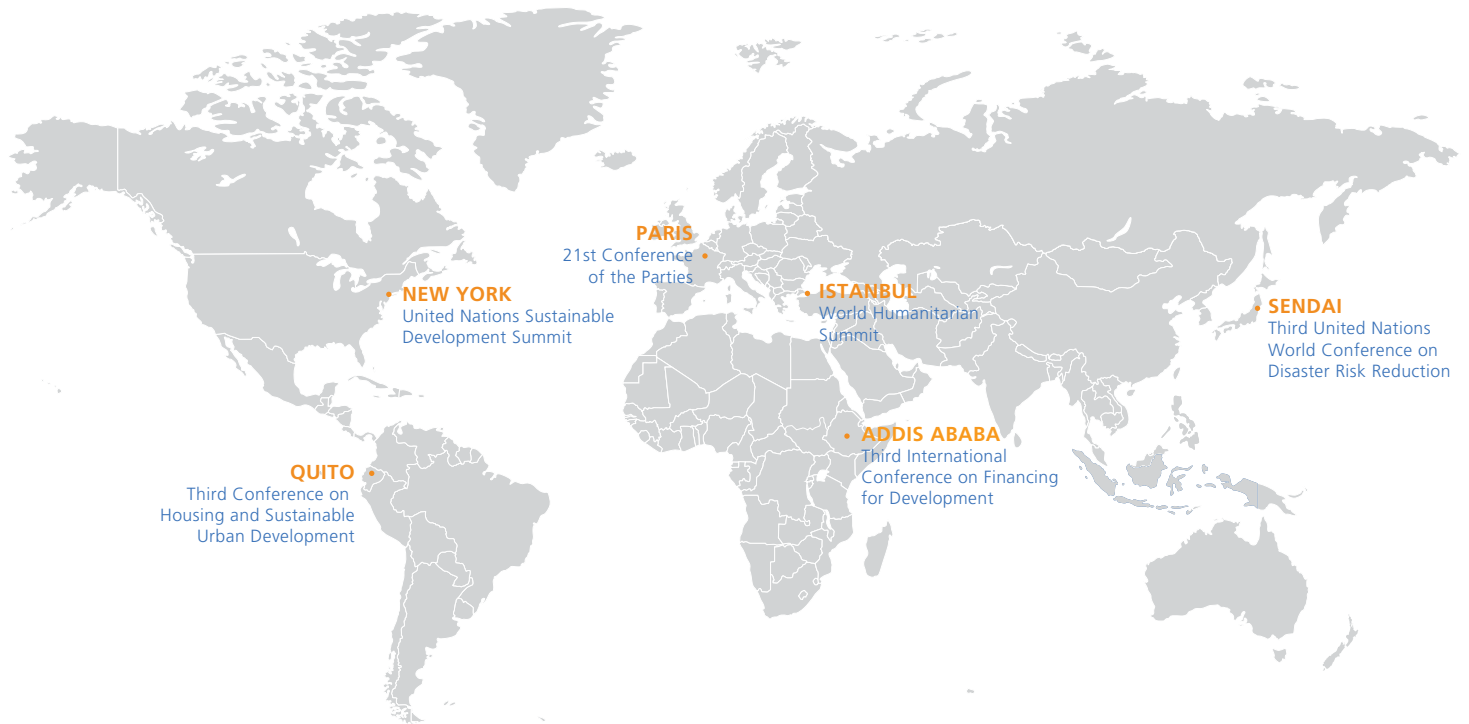
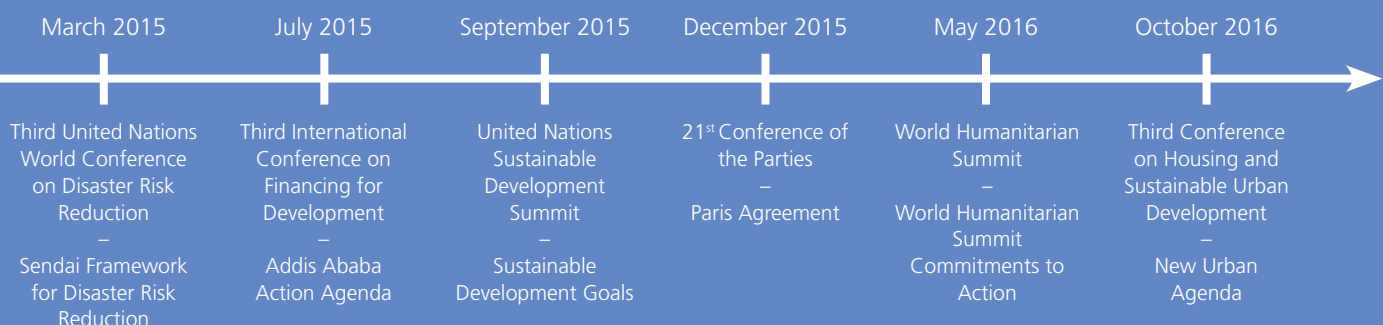


FIGURE 2.1: Timeline of 6 Agendas of the Post-2015 Development Framework.



Resilience – both as a framework for thinking and a development aim – entered the UN agenda in the early 2000s, when the official report of the Second United Nations World Conference on Disaster Reduction (Hyogo, 2005) referred to the resilience of communities and nations as a key issue to address in order to reduce risk vulnerability². Among the five priorities for action profiled during the summit, representatives from the participatory countries recognised the importance of raising “a culture of safety and resilience at all levels”, and put particular emphasis on the need to both foster collaboration across different sectors and encourage resilience-oriented education, training and knowledge. Since then, resilience thinking regularly informed the Hyogo Framework for Action’s (HFA) three reporting cycles (2007-08, 2010-11, 2013-14) at the regional, national and local level³, while gaining ever greater prominence in the mission of the United Nations Office for Disaster Risk Reduction (UNISDR) and the UN charter in general.

As the transformative potential and interconnected challenges of urbanisation become more apparent, the urban scale constitutes a field of major activity for the UN commitment to resilience building. UNISDR and the United Nations Human Settlements Programme (UN-Habitat) have been at the cutting edge of integrating sustainable urban development and urban risk reduction with resilience thinking. While a wide array of UN bodies have tailored their missions accordingly – following a multi-sectoral and multi-hazard understanding of the concept – the United Nations Plan of Action on Disaster Risk Reduction for Resilience – joined by 23 UN agencies in May 2013 – represents the most significant step in this direction⁴.

As emphasised many times by former Secretary-General, Ban Ki-moon, “Our struggle for sustainability will be won or lost in cities”⁵. Accordingly, the *Making Cities Resilient Campaign* (launched in 2010 under the UNISDR’s umbrella) and the *City Resilience Profiling Programme* (launched by UN-Habitat in 2012) constitute a more tangible effort to assist local governments to enhance urban resilience with an integrated approach.

“Our struggle for sustainability will be won or lost in cities”.

– Ban Ki-moon, former Secretary-General of the United Nations

Consistent with a multi-disciplinary understanding of the term (see Chapter one), the long-range outcomes of resilience-informed policies have been reasserted at each step of the Post-2015 Development Framework: from disaster risk reduction to sustainable development, and from climate change to the global humanitarian goals. Resilience thinking did, therefore, not only trigger a shift from post-crisis management to risk reduction and prevention, but also encouraged a more cross-mandate approach to development challenges within the wider UN architecture.

Sendai Framework for Disaster Risk Reduction

BOX 2.1: Hyogo Framework for Action.

Defined during the Second UN World Conference on Disaster Risk Reduction, the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (HFA) is the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. It was developed and validated with the many partners needed to reduce disaster risk – governments, international agencies, disaster experts and many others – bringing them into a common system of coordination.

Accordingly, the UNISDR's Making Cities Resilient Campaign (MCRC) – launched in 2010 – is meant to support the implementation of the HFA at the local level, and now carries on through 2020 to equally support the implementation of the Sendai Framework for Disaster Risk Reduction (2015-2030) at all scales, from national to local level.

The Sendai Framework for Disaster Risk Reduction, also known as the Sendai Framework, is a 15-year, voluntary, non-binding agreement signed during the Third UN World Conference on Disaster Risk Reduction in Sendai (March 2015). The Framework pursues the substantial reduction of disaster risk and losses in lives, livelihoods and health, as well as in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. Under the supervision of UNISDR, which is tasked to support its implementation, follow-up and review, the Sendai Framework draws upon the achievements of the Hyogo Framework for Action (HFA) and outlines the global course for the following fifteen years. It mutually reinforces other post-2015 international agendas, notably the Sustainable Development Goals (SDGs) and the Paris Agreement, and confirms a general trend towards a more holistic and multi-hazard understanding of resilience. The Sendai Framework recognises states as the responsible actors for reducing vulnerability and enhancing resilience, whilst cross-sectoral and multi-scale coordination is also encouraged between local, regional, national and international stakeholders.

As explained by Margareta Wahlström, former Special Representative of the Secretary General for Disaster Risk Reduction, “the most significant shifts are in the strong emphasis on disaster risk management as opposed to disaster management, in the reduction of disaster risk as an expected outcome, a goal focused on preventing new risks, reducing existing ones and strengthening resilience, as well as including primary responsibility of states to prevent and reduce disaster risk, all-of-society and all-of-State institutions engagement”⁶.

The framework's approach to disaster risk reduction sets out seven targets to be pursued globally by prioritising four areas of action. Global progress on the implementation of the Sendai Framework is measured through a set of indicators relating to disaster risk reduction. These targets were endorsed by the United Nations General Assembly and cohere with the Sustainable Development Goal indicators⁷.

7 Global Targets

- ↓ Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared with 2005-2015.
- ↓ Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared with 2005-2015.
- ↓ Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.
- ↓ Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.
- ↑ Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.
- ↑ Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.
- ↑ Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information assessments to people by 2030.

4 Priorities for Action

Understanding disaster risk	Strengthening disaster risk governance to manage disaster risk
Investing in disaster risk reduction for resilience	Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction



Monsoon floods continue to inundate Bangkok, Thailand.
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Addis Ababa Action Agenda

The Addis Ababa Action Agenda was agreed by the 193 United Nations Member States attending the Third United Nations International Conference on Financing for Development (Addis Ababa, Ethiopia, 13-16 July 2015) and subsequently endorsed by the United Nations General Assembly in resolution 69/313 of 27 July 2015. It builds upon the outcomes of the previous Financing for Development conferences, namely the Monterrey Consensus (Mexico, 2002) and the Doha Declaration (Qatar, 2008). Reinvigorating the financing for development follow-up process, the Agenda 1) addresses the evolving development cooperation landscape, 2) tracks the interrelationship between all sources of development finance, and 3) maps the synergies between financing objectives for sustainable development and the United Nations development agenda beyond 2015.

Member States delivered a comprehensive array of policy actions – including a package of 100 concrete measures spanning technology, innovation, trade and data – to support catalysing the means for a global transformation to sustainable development and the achievement of the Sustainable Development Goals. The policy actions emphasise the need for mobilising domestic resources, as well as for aligning private investment with sustainable development, along with public policies and regulatory frameworks to set appropriate incentives⁸.

Participating countries agreed on:

Technology – Establishing a Technology Facilitation Mechanism to boost collaboration among governments, civil society, private sector, the scientific community, United Nations entities and other stakeholders in order to support the Sustainable Development Goals;

Infrastructure – Establishing a Global Infrastructure Forum to identify and address infrastructure gaps, highlight opportunities for investment and cooperation, and ensure that projects are environmentally, socially and economically sustainable;

Micro-, small- and medium-sized enterprises – Promoting affordable and stable access to credit for smaller enterprises, developing a strategy for youth employment and implementing the International Labour Organization Global Jobs Pact by 2020;

Social protection – Adopting a new social compact for vulnerable groups, through the provision of social protection systems and measures for all;

Health – Taxing harmful substances to deter consumption and to increase domestic resources;

Foreign aid – Recommitting to achieve the target of 0.7 per cent of gross national income for official development assistance – 0.15 to 0.20 per cent for least developed countries;

A package of measures for the poorest countries – Reversing the decline in aid to the poorest countries, with the European Union committing to increase its aid to least developed countries to 0.2 per cent of gross national income by 2030;

Taxation – Strengthening support for the work of the UN Committee of Experts on International Cooperation in Tax Matters, to improve its effectiveness and operational capacity, as well as the engagement with the Economic and Social Council;

Climate change – Implementing their commitment to the goal of jointly mobilised USD 100 billion per year by 2020 from a wide variety of sources to address the needs of developing countries.

The Addis Ababa Action Agenda was an essential step towards the adoption of the 17 Sustainable Development Goals and the development of the Paris Agreement.

Ban Ki-moon, Secretary-General of the United Nations at the time, defined the agreement as “a critical step forward in building a sustainable future for all” as it delivered “a global framework for financing sustainable development.”⁹ The Addis Ababa Action Agenda was as an essential step towards the adoption of the 17 Sustainable Development Goals and the development of the Paris Agreement.

Sustainable Development Goals

BOX 2.2: Millennium Development Goals.

Defined during the Millennium Summit in 2000 in New York – where the Millennium Declaration was adopted by Member States – the eight Millennium Development Goals (MDGs) represented an unprecedented effort to meet the needs of the world's poorest, with priorities addressing extreme poverty, gender equality, education, environmental sustainability, basic human rights, shelter and security:



Goal 1: Eradicate Extreme Hunger and Poverty



Goal 2: Achieve Universal Primary Education



Goal 3: Promote Gender Equality and Empower Women



Goal 4: Reduce Child Mortality



Goal 5: Improve Maternal Health



Goal 6: Combat HIV/AIDS, Malaria and other diseases



Goal 7: Ensure Environmental Sustainability



Goal 8: Develop a Global Partnership for Development

The eight MDGs paved the way for the Sustainable Development Goals fifteen years later.

Building upon the achievements of the Millennium Development Goals (MDGs) and seeking to assess their unfinished businesses, the Sustainable Development Goals (SDGs) – also referred to as the Global Goals – chart the 2030 Agenda for Sustainable Development. Through the 17 goals and 169 targets formulated during the UN Sustainable Development Summit in New York in 2015, global leaders reasserted their commitment to work in collaborative partnership

towards a peaceful, sustainable, inclusive and poverty-free world, wherein prosperity and dignity would be guaranteed to both the natural environment and all human peoples. Encompassing the social, the economic and the environmental dimensions of sustainable development, the summit's outcome features as a pivotal step against the Post-2015 Development Framework. Here following is the full list of the 17 goals profiled during the meeting.



1. End poverty in all its forms everywhere



2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture



3. Ensure healthy lives and promote well-being for all and at all levels



4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



5. Achieve gender equality and empower all women and girls



6. Ensure availability and sustainable management of water and sanitation for all



7. Ensure access to affordable, reliable, sustainable and modern energy for all



8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all



9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation



10. Reduce inequality within and among countries



11. Make cities and human settlements inclusive, safe, resilient and sustainable



12. Ensure sustainable consumption and production patterns



13. Take urgent action to combat climate change and its impacts



14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development



15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels



17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Paris Agreement

The 21st Conference of the Parties, also known as the 2015 Paris Climate Change Conference, was attended in Paris by close to 190 countries responsible for around 95% of global greenhouse gas emissions. The final agreement – labelled the Paris Agreement – was reached in December 2015, signed by 195 countries in New York in April 2016, and will be fully in force by 2020.

“There are 188 national climate change plans produced by 188 countries that are looking at what they can do to address climate change, from the perspective of their national interests and what is actually going to move them forward. This is very strong ground”.

– Christiana Figueres, UNFCCC former Executive Secretary

The signatory nations commit themselves to limiting average global warming to 2 degree Celsius – possibly 1.5 – above the pre-industrial temperatures, as well as producing national reports on gas emissions, to be registered by the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat every five years from 2020. Moreover, developing countries will be entitled to access USD 100 billion per year – within the Green Climate Fund framework – in order to both ease the reduction of greenhouse gas emissions and cushion the unavoidable social impacts of climate change¹⁰.

Although the agreement’s bottom-up structure, according to which each country commits itself to reaching self-defined goals, is not legally binding for the signatories, its unprecedented universality and monitoring system create well-funded expectations about an effective trend reversal over the upcoming decades. In the words of the former Executive Secretary of the United Nations Framework Convention on Climate Change, Christiana Figueres, “there are 188 national climate change plans produced by 188 countries that are looking at what they can do to address climate change, from the perspective of their national interests and what is actually going to move them forward. This is very strong ground”¹¹.

Nations Unies Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris, France

COP21 in Paris, France.

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World Humanitarian Summit Commitments to Action

Announced for the first time in 2012 and concluding a one-year consultation process, the World Humanitarian Summit, *One Humanity: Shared Responsibilities*, defines a new Agenda for Humanity composed of 32 core Commitments to Action. The Agenda for Humanity is integrated in the Post-2015 Development Framework and as then Secretary General Ban Ki-moon made clear in his accompanying report, “We have agreed on an ambitious sustainable development agenda to end global poverty. We have adopted a universal climate change agreement and a new framework to reduce disaster risk and enhance resilience. We are initiating reforms together in our peace and security sector. However, more progress for more people is urgently needed”¹².

As humanitarian action faces unprecedented challenges at unmatched proportions, the World Humanitarian Summit featured as a key step in reinforcing collective responsibility, preventing suffering and ensuring human dignity in crisis scenarios.

Eight consultations, conducted between May 2014 and July 2015, pinpointed Dignity, Safety, Resilience, Partnerships and Finance as the five main areas for action, each presenting an ambition for the future of humanitarian action. The meeting brought together over 5,000 participants, from 185 organisations including Heads of State and Government, leaders from crisis-affected communities, Chief Executives from the private sector, Heads of multilateral organisations, international and national NGOs, youth and civil society representatives, members of diaspora, civil military, and academia (38% non-governmental, 29% member state, 18% other, 8% United Nations, 7% private sector).

The World Humanitarian Summit discussions were organised through 7 roundtables – including 32 core commitments to action. The resulting Agenda for Humanity was framed across 3 main goals and 5 core responsibilities¹³.

7 Round Tables

Political leadership to prevent and end conflicts

Uphold the norms that safeguard humanity

Leave no one behind: a commitment to address forced displacement

Women and girls: catalysing action to achieve gender equality

Changing people's lives: from delivering aid to ending need

Natural disasters and climate change: managing risks & crises differently

Financing: investing in humanity

3 Main Goals

Reaffirm our commitment to humanity and humanitarian principles

Initiate actions and commitments which enable countries and communities to prepare for and respond to crises and be more resilient to shocks

Share best practices which help save lives around the world, placing affected people at the centre of humanitarian action and alleviating suffering

5 Core Responsibilities

Prevent and end conflict

Respect rules of war

Leave no one behind

Working differently to end need

Invest in humanity

2.2 HABITAT III

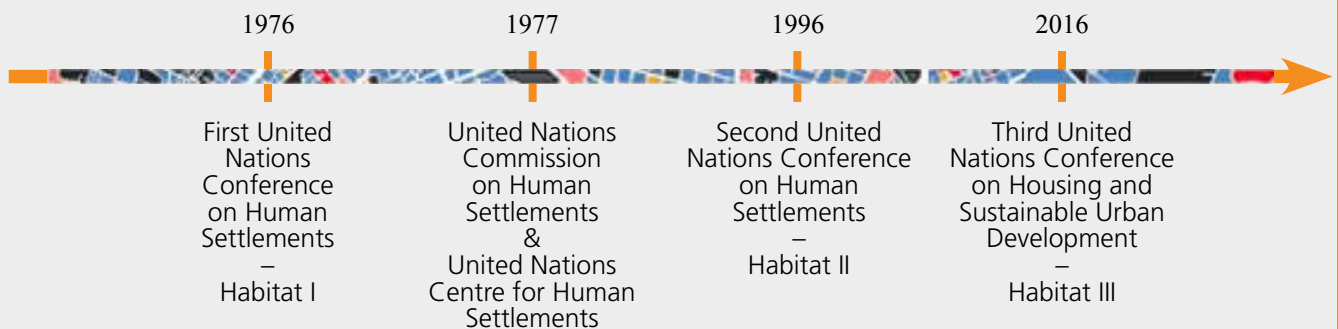
BOX 2.3: The History of the Habitat Process.

Habitat I and Habitat II constituted the First and Second United Nations Conferences on Human Settlements, held in Vancouver (1976) and Istanbul (1996) respectively. The need for a global UN conference on urban development was firstly acknowledged by the General Secretariat in the early 1970s, when uncontrolled urbanisation and its interconnected impacts were emerging as a common trend in both developing and developed countries.

At that time, although the challenges posed by urban immigration were less prominent in the UN agenda – mainly because two thirds of humanity were still rural – the issue was brought to the fore in the first UN Conference on Human Settlements, namely Habitat I.

That summit resulted also in the creation, on 19 December 1977, of the precursors of UN-Habitat: the United Nations Commission on Human Settlements (UNCHS) – an intergovernmental body – and the United Nations Centre for Human Settlements (commonly referred to as “Habitat”), which served as the executive secretariat of the Commission. Two decades later, in 1996, the United Nations held a second conference on cities – Habitat II – in Istanbul, Turkey, to assess two decades of progress since Habitat I as well as to set fresh goals for the new millennium. Adopted by 171 countries, the political document – dubbed the Habitat Agenda – that came out of this “city summit” contained over 100 commitments and 600 recommendations¹⁴.

FIGURE 2.2. Timeline of the Habitat Process.



Announced by the UN Resolution 66/207 of 2012, the Third United Nations Conference on Housing and Sustainable Urban Development, or Habitat III, took place in Quito, Ecuador, from 17 to 20 October 2016. As the third bi-decennial summit on urban development, it built upon the achievements of the Second United Nations Conference on Human Settlements (Habitat II, Istanbul 1996), addressing its ongoing activities, and laid out the New Urban Agenda (NUA) for the next two decades.

Habitat III was an opportunity to understand sustainable development and climate change from an urban standpoint, investigating how these two trends critically interconnect with urbanisation.

Benefitting from an unprecedented global momentum for change, Habitat III added a key element to the 2030 Agenda for Sustainable Development, drawing upon and strengthening the outcomes of major international dialogues, notably the Third UN World Conference on Disaster Risk Reduction (Sendai, March 2015), the Third International Conference on Financing for Development (Addis Ababa, July 2015), the UN Sustainable Development Summit (New York, September 2015), the 21st Conference of the Parties (Paris, December 2015), and the World Humanitarian Summit (Istanbul, May 2016). As elucidated by the Conference's Secretary General, Joan Clos (also Executive Director of UN-Habitat) – on the occasion of the first Preparatory Committee in New York (September 2014) – Habitat III was an opportunity to understand sustainable development and climate change from an urban standpoint, investigating how these two trends critically interconnect with urbanisation.

For the first time in history, more than half of the global population lives in urban areas and that proportion is believed to grow up to 70% by 2050. This makes urbanisation one of our century's most transformative trends – a trend posing great opportunities, but also major economic, social, environmental and spatial challenges. As the former Secretary General Ban Ki-moon made clear in *One Humanity: Shared Responsibility*, the way in which we think, plan and manage our cities is becoming increasingly responsible for the resilience of the world we live in¹⁵. Urban areas hold the promise of a better quality of life and greater economic chances, however, in poorer and unstable countries especially, they can become amplifiers of social conflict, inequalities and natural hazards. Therefore, in order to cushion the impacts of this negative potential, and turn them into opportunities for all purposes, a new urban paradigm is needed.

Beginning with the Quito Declaration on Sustainable Cities and Human Settlements for All¹, the New Urban Agenda – the outcome of Habitat III – contributes to the implementation and localisation of the 2030 Agenda for Sustainable Development in an integrated manner, as well as to the achievement of the Sustainable Development Goals and targets – particularly Goal 11 of making cities and human settlements inclusive, safe, resilient and sustainable.

Urban areas hold the promise of a better quality of life and greater economic chances, however, in poorer and unstable countries especially, they can become amplifiers of social conflict, inequalities and natural hazards.

It, therefore, embodies a substantial paradigm shift with regards to a wide array of aspects, directly affecting the way in which cities are planned, designed and developed. Urban Planning and Urban Design – coupled with Innovation, Data and Technology – are hence recognised as fundamental tools for both taking advantage of the opportunities provided by urbanisation and to confront the challenges – for instance socio-economic exclusion or spatial segregation – that unregulated or poorly planned urban growth has generated. Moreover, consistently with the comprehensive and multi-sectoral bias of the parallel development frameworks – including the World Humanitarian Summit achievements – the NUA shows also proactive determination to address a broader set of urban challenges, from post-conflict reconstruction to post-disaster recovery and from humanitarian priorities to people displacement¹⁶.

¹ The Quito Declaration on Sustainable Cities and Human Settlements for All – which anticipated the delivery of the New Urban Agenda by a month – reaffirmed the shared vision, the principles and commitments informing the discussion that took place in Quito between 17 and 20 October 2017.

As the emerging trend in sustainable development and urban development resilience, in particular, represents a transversal concept across the entire document, whilst also being directly addressed as one of the three priorities to be pursued on the social, economic and environmental realm. These are: *a) Sustainable urban development for social inclusion and ending poverty, b) Sustainable and inclusive urban prosperity and opportunities for all, and c) Environmentally sustainable and resilient urban development.*

UN-Habitat – whose mandate is strengthened and fully recognised by the Habitat III Secretariat – affirms its commitment to increase resilience of cities and reduce their exposure to both natural and human-made disasters.

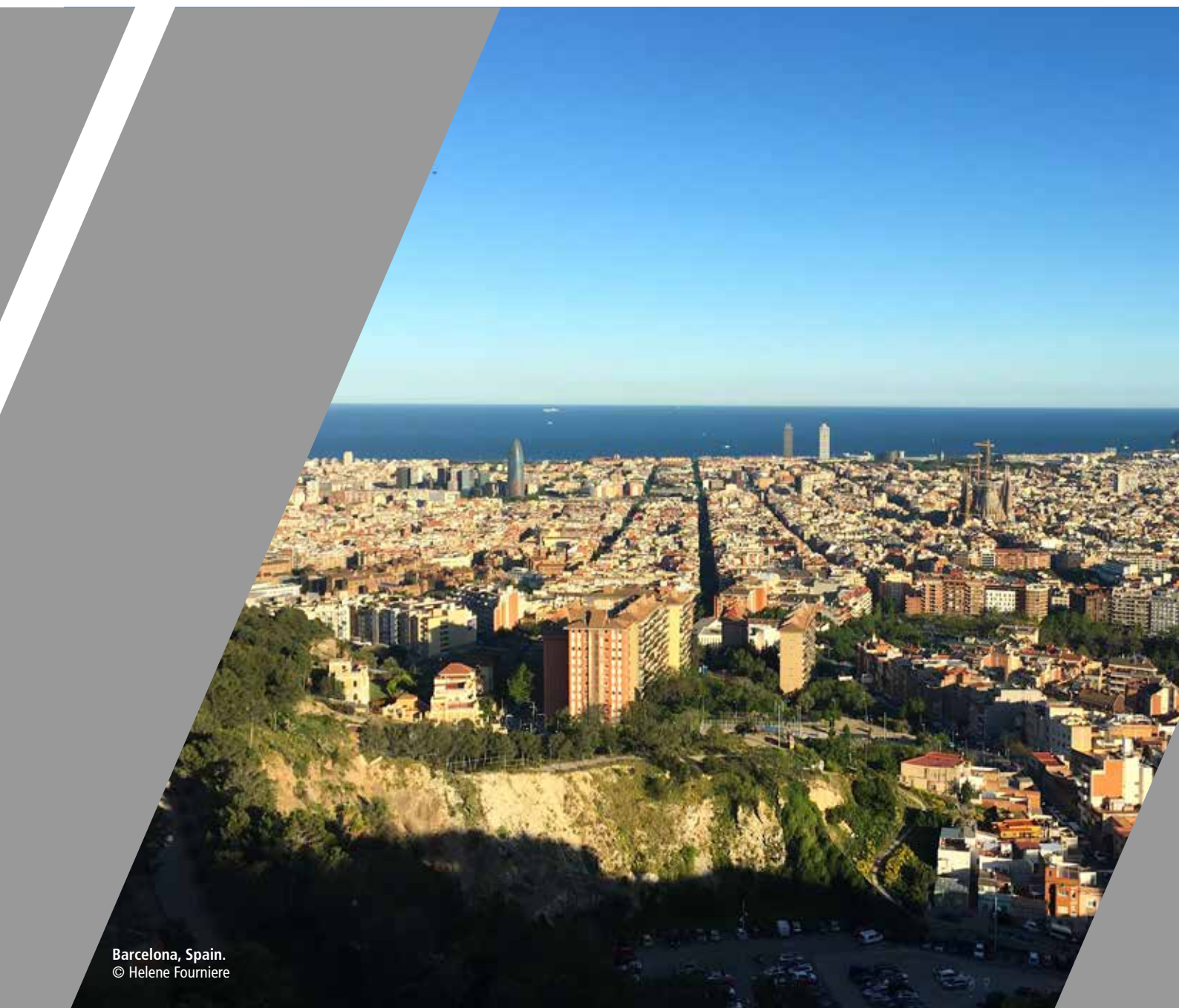
Accordingly, the City Resilience Profiling Programme (CRPP) was launched in 2012 to support local governments in the formulation of a comprehensive and integrated urban planning and management approach, in addition to develop tools for measuring city resilience to all types of hazards.

Furthermore, UN-Habitat will oversee the monitoring and ensuring of a coordinated follow-up of the NUA, as well as of the urban and human settlements components of the 2030 Agenda for Sustainable Development. Consistent with the follow-up systems formulated by the 2030 Agenda for Sustainable Development, these periodic progress reports should engage with different stakeholders at the local, regional, national and international level.



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CHAPTER 3

UN-Habitat: Urban Resilience Programme



CHAPTER 3

UN-Habitat: Urban Resilience Programme

“The Urban Resilience Programme supports local governments to plan out risk and build in resilience by transforming the way in which ‘normal’ urban planning, development, and management functions of local governments are undertaken.”

– *Dan Lewis*

Chief, Urban Risk Reduction
Head, Urban Resilience Programme
UN-Habitat

3.1 URBAN RESILIENCE PROGRAMME

UN-Habitat’s urban resilience work started in 2012, under the City Resilience Profiling Programme (CRPP), in order to provide national and local governments with adequate tools for assessing and improving the resilience of cities to multi-hazard impacts, including those related to climate change. In the following years, CRPP expanded scope to reach a broader audience and developed a new spectrum of activities. In 2016, it became a pillar of the agency-wide Urban Resilience Programme (URP).

Benefitting from an alignment with the Post-2015 Development Framework and recognising resilience and sustainability as two complementary paradigms of urban development, the Programme goes beyond conventional approaches to ‘risk reduction’ and advocates for a forward-looking approach to cities, encompassing the spatial, physical, functional and organisational dimensions of any human settlement. It recognises the complexities and unique value of cities and the inherent interdependencies of each part of the urban system, the potential impacts of hazards and levels of stakeholder engagement. Urban resilience is qualified and quantified through the characteristics of persistency, adaptability, inclusivity, integration, reflexivity and transformation; and defined as the ability of any urban system to withstand and recover quickly from the impact of all plausible hazards – both shocks and stresses – and maintain continuity of functions.

To be effective in its endeavours, the URP projects and activities are organised across three main ‘pillars’, namely 1) **technical cooperation**, 2) **advocacy** and 3) **knowledge**.

The Programme goes beyond conventional approaches to ‘risk reduction’ and advocates for a forward-looking approach to cities, encompassing the spatial, physical, functional and organisational dimensions of any human settlement.

Through these channels, the Programme:

- *Provides* urban leaders, planners and developers with the necessary tools and information to calibrate and measure their city’s resilience in order to make informed governance and investment decisions;
- *Mobilises* transformational, sustainable improvements to the physical, spatial and functional elements of cities to safeguard against multiple hazards and ensure continuity of urban processes and services;
- *Empowers* cities to ‘do more with what they have’ and catalyse new finance opportunities by promoting resilience as criterion for investments;
- *Improves* accountability in local level policy and budgetary decisions;
- *Provides* a common, global understanding of urban resilience through the development of indices and standards.

Technical Coordination

The technical assistance delivered by the URP to local and national governments in different regions, through its City Resilience Profiling Programme (CRPP), includes a spectrum of activities: from the development and implementation of diagnostic and strategic planning tools to the validation and oversight of results and projects, as well as the identification of resilience financing opportunities, amongst others¹. The cornerstone of the CRPP is the City Resilience Profiling Tool (CRPT): a forward-looking multi-sectoral, multi-hazard and multi-stakeholder diagnostic instrument, designed to assess and measure the resilience of urban systems and to inform the preparation of a Resilience Action Plan (RAP). The Tool is intended to be used by municipal leaders, urban planners, and other personnel with responsibilities for urban development.

The city profiles produced by the CRPT identify UN-Habitat entry points through 4 key dimensions of the urban system:

- *Spatial vulnerabilities*: addressed through planning and design; policy and regulation; land readjustment; urban extensions; and capital investment/finance incentives;
- *Physical vulnerabilities*: addressed through improving regulation, codes and standards; retrofitting/upgrading bulk and distributive infrastructure; densification; transport; public space;
- *Functional vulnerabilities*: addressed through urban design; service, economic, commercial continuity; regulatory reform; municipal revenue/finance; transport/energy/utility/communications upgrading;
- *Organisational vulnerabilities*: addressed through urban regulation and legal frameworks; strengthening stakeholder engagements (public, private and civil society); social and economic programming; and jurisdictional mapping².

The cornerstone of the CRPP is the City Resilience Profiling Tool: a forward-looking multi-sectoral, multi-hazard and multi-stakeholder diagnostic instrument, designed to assess and measure the resilience of urban systems and to inform the preparation of a Resilience Action Plan.

BOX 3.1: 'Making Cities Sustainable and Resilient'

As a joint initiative between DG-DEVCO, UNISDR and UN-Habitat – through the URP – and funded by the European Commission, this project aims to locally implement the City Resilience Profiling Tool and design a context-specific Resilience Action Plan. The project will be conducted in four cities: Asuncion, Dakar, Maputo, Port Vila.

DG-DEVCO is the European Commission's Directorate General for International Cooperation and Development (See DG-DEVCO profile in chapter four)³.

The Resilience Action Plan is an action-oriented output of the CRPP, based on adaptive learning, informed by the CRPT and vice-versa. It delivers an array of recommendations – tailored to the local context – addressing national urban policies, rules and regulations, planning and design, local implementation mechanisms and urbanisation financing, amongst others. The RAP provides city authorities with a unique opportunity to objectively take informed and actionable decisions, in order to measure, increase and monitor the resilience status of their urban systems and to adopt sustainable urban development strategies.

Partnerships make the CRPP a unique platform for cities to share best practices and transversal solutions to common challenges.

MAP 3.1: Cities Engaged with the Urban Resilience Programme.



BOX 3.2: RESCCUE Project.

The RESCCUE project – RESilience to cope with Climate Change in Urban arEas: a multi-sectoral approach focusing on water – was launched in May 2016, as part of the Horizon 2020 research initiative (see RESCCUE profile in chapter four). The project endeavours to help cities around the world that are facing stresses and shocks, envision a multi-sectoral and holistic approach to urban resilience.

The project will be validated in 3 pilot cities – Barcelona, Lisbon and Bristol – while engaging with a variety of actors from both the public and the private sector. UN-Habitat through the URP will provide technical assistance, validation and oversight during both the diagnostic phase and the development of a tailored Resilience Action Plan⁴.

The CRPT is under implementation in Asuncion (Paraguay), Dakar (Senegal), Maputo (Mozambique) and Port Vila (Vanuatu) – within the framework of a joint project between the European Commission, UN-Habitat and the UNISDR (see informative box) – as well as in Yakutsk (Russian Federation) and Barcelona (Spain), thanks to bi-lateral agreements between the local administrative bodies of these cities and the URP. These partnerships also make the CRPP a unique platform for cities to share best practices and transversal solutions to common challenges.

Simultaneously, the City Resilience Profiling Programme actively assists in the development and implementation of more sectoral projects in Haiti, Indonesia, Pakistan and the Philippines under the overarching URP umbrella. It also provides support and validation based on the results produced either by cities themselves or by other partners.

Consequently, the Programme offers technical assistance to the Union for the Mediterranean (UfM) – both concerning its Urban Projects Finance Initiative (UPFI) and for the implementation of the New Urban Agenda in the Mediterranean region – and validation and oversight of the RESCCUE Project, through the European Commission’s H2020 framework (see below).

Overall, the CRPP is or has been active in Chile, Haiti, Indonesia, Iran, Jamaica, Lebanon, Mozambique, New Zealand, Nigeria, Pakistan, Paraguay, Philippines, Portugal, Russian Federation, Senegal, Spain, Sri Lanka, Tanzania, United Kingdom and Vanuatu. Each of these projects provides substantial opportunities for the implementation of the New Urban Agenda across all UN-Habitat’s branches and units.



Crossing in Maputo, Mozambique.
© Flickr/John Lynch

Advocacy

In parallel to the broad spectrum of technical activities, the Urban Resilience Programme engages in several actions of advocacy, aiming to connect local and national governments to large-scale communities of practice. The four main platforms are chaired or co-hosted by UN-Habitat through the Urban Resilience Programme:

- ***Global Alliance for Urban Crises (GAUC)***

GAUC is a multi-stakeholder initiative emerging from the World Humanitarian Summit (Istanbul, Turkey in 2016) and aimed to provide knowledge, build capacities and formulate approaches, in order to better prevent, prepare for and respond to urban crises. The Alliance, which gathers a diverse array of humanitarian and development actors, urban professionals and local authorities, frames an inclusive vision of safe, resilient and sustainable cities, well aligned with the 2030 Agenda for Sustainable Development. The GAUC Secretariat is co-hosted by UN-Habitat and United Cities and Local Governments (see Partnerships and Alliances in chapter four)⁵.

- ***Medellin Collaboration on Urban Resilience (MCUR)***

The Collaboration gathers ten of the most prominent actors committed to resilience-building globally and works across over 3,500 cities around the world, leveraging more than USD 2 billion in annual funds. It is chaired by UN-Habitat and includes UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance. These actors are at the cutting edge of sustainable urban growth and development, and stimulate an unprecedented effort towards resilience across multiple sectors and scales (see Partnerships and Alliances in chapter four).

- ***Making Cities Resilient Campaign (MCRC)***

Launched in 2010 by the United Nations Office for Disaster Risk Reduction (UNISDR), the Campaign aims to support sustainable urban development by promoting resilience activities and by increasing local level understanding of disaster risk. The MCRC will run from 2010 to 2020 and beyond, building upon ten essentials for making cities resilient. The URP is responsible for chairing its Steering Committee since 2016.

Connecting local and national governments to large-scale communities of practice.

- ***IASC Reference Group on Meeting Humanitarian Challenges in Urban Areas (MHCUA)***

In 2010, the Meeting Humanitarian Challenges in Urban Areas Task Force developed the Strategy for Meeting Humanitarian Challenges in Urban Areas with the aim of increasing the effectiveness of the international community's responses to natural and man-made humanitarian crises in urban areas. In November 2010 and February 2011, both the Inter-Agency Standing Committee (IASC) Working Group and the IASC Principals respectively endorsed the Strategy. It builds upon six objectives to improve humanitarian response in urban areas:

1. strengthening partnerships among urban stakeholders for more effective humanitarian response,
2. strengthening technical surge capacity with urban skills,
3. developing or adapting humanitarian tools and approaches for urban areas,
4. protecting vulnerable urban population against gender-based exploitation and violence,
5. restoring livelihoods and economic opportunities during initial phase for expedited early recovery in urban areas, and
6. improving preparedness in urban areas to reduce vulnerability and save lives.

The MHCUA Task Force which prepared the Strategy was later transformed, by the IASC Working Group, into the IASC Reference Group for MHCUA to coordinate the implementation of the Strategy by participating agencies, NGOs and governments. The IASC Reference Group for MHCUA is co-chaired by IMPACT Initiatives and UN-Habitat⁶.

Knowledge

Finally, from a research perspective, the Urban Resilience Programme is member and founder of the recently established Urban Resilience Institute (URI) – headquartered in Barcelona – bringing together actors from the academic and development realm, in order to facilitate a constant exchange and production of knowledge on resilience in urban settlements. The Institute will serve as a global hub for innovation, learning, policy guidance, and dissemination of best practices on resilience to cities around the world.

The Urban Resilience Programme is member and founder of the recently established Urban Resilience Institute – bringing together actors from the academic and development realm.



BOX 3.3: URP's Linkages to the 2030 Agenda for Sustainable Development.

UN-Habitat's Urban Resilience Programme addresses elements of sustainable urban development throughout the objectives of the 2030 Agenda for Sustainable Development notably in the Sustainable Development Goals 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15 and 16 where there are direct references to

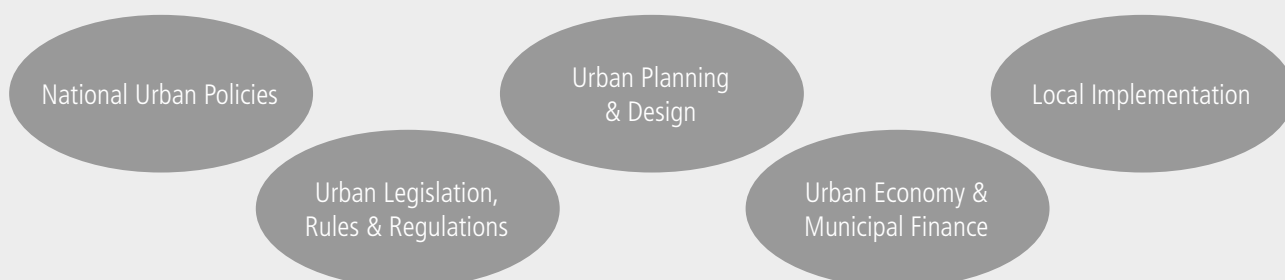
resilient sectors relevant to cities⁷; as well as in other goals where the references are implicit. The URP also addresses many of the aims stated in the Preamble and the Declaration's paragraphs 7, 9, 14, 23, 29 and 33 of the Agenda⁸.



BOX 3.4: URP's Linkages to the New Urban Agenda.

UN Habitat's Urban Resilience Programme proactively contributes to deliver the New Urban Agenda's goals, including:

- Integrating new planning paradigms that aim to increase the capacity of the urban system, to absorb and recover quickly from the impact of all plausible hazards – shocks and stresses – and to maintain the continuity of urban functions.
- Developing or enhancing national and local legal/regulatory frameworks that enable and govern the urban development process.
- Analysing the vulnerability and risk inherent at all spatial scales, and rationalising better, safer and more efficient approaches to land use.
- Promoting good practice in local economic development strategies through marketing safer, more resilient cities; with stronger, more diverse economies, and innovations in financing sustainable and resilient urban development⁹.



3.2 EXAMPLES OF UN-HABITAT PROGRAMMES

Emergency Flood Response in Khartoum for Vulnerable Countries

Partners:

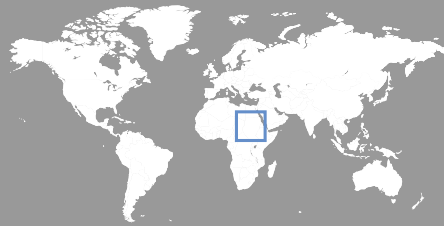
UN-Habitat Country Office - Sudan
Government of Sudan

Donors:

Government of Japan

Hazard addressed:

Heavy rainfall
Flash flooding



MAP 3.2: UN-Habitat Programme in Khartoum, Sudan.

Methodology

Regarding the Emergency Flood Response in Khartoum for Vulnerable Communities project, a community-based participatory approach was adopted, in order to minimise the impact of floods, and enhance the capacity to recover from it. Three main objectives were defined – paying particular attention to communities in vulnerable situations – with the aim of enhancing the resilience of the urban system through the improvement of governance aspects:

1. Development of the required institutional and managerial capacity of both national/local government and local communities, regarding urban planning, land management and public services delivery through a ‘learning by doing’ process;
2. Demonstrate that more resilient building codes for services and infrastructure, as well as self-help housing, can be delivered at an affordable cost using environmental-friendly technologies, mainstreaming community participation, ensuring government’s ownership and promoting social integration and economic recovery mechanisms;
3. Development of the required institutional and managerial capacity of the Government of Sudan in the Emergency Construction of Drainage Systems and Access Roads to the main roads.

The project in detail

The Emergency Flood Response in Khartoum for Vulnerable Communities was implemented in 2013 as a response to an emergency situation induced by heavy rainfalls and cascading flash floods, leading to high amount of losses and social disruption.

One of the main causes of floods in Khartoum is due to insufficient drainage system. In particular, newly developed urban areas are now blocking the natural water stream from the high land, while roads network and irrigation canals were conceived with unsatisfactory drainage systems, mostly due to inadequate planning, not taking into account the geographical characteristics of the site. Furthermore, road embankment built without hydrological analysis and good drainage, are also disturbing the flow regime of streams and runoff, which increases the risk of flooding in residential areas. Similarly, building houses in the floodplain with inadequate and low quality construction materials, and without consideration of the nearby river, led to damages to houses and properties from inundations.

Taking a community-based approach to those hazards, the project – which was implemented between April 2014 and March 2015 – conducted a Flood Rapid Assessment Study (FRAS) to both map risk and vulnerable areas and deliver recommendations for permanent solutions. This was instrumental in

developing a community action/contingency plan for responding to flood events properly, defining roles and responsibilities of different stakeholders as well as coordination and communication mechanisms within the context of the action plan. Moreover, training was delivered on flood management and city resilience, targeting vulnerable communities and local authorities to respond effectively and collectively to flood risk.

As a part of these permanent solutions, and to tackle the vulnerable drainage system, two major box culverts were constructed by the government and four pipe culverts were built through the project. Moreover, environmental-friendly and cost-effective construction technology – so called Stabilised Soil Block (SSB) – were disseminated and applied as flood resistant construction material, through three pilot models buildings, namely a health centre, a youth centre and a secondary school. The construction of the pilot models demonstrated to the communities the technology used, and gave vulnerable groups a secured access to reliable services. The SSB, as woodless construction technology, was successfully tested and proved to be 30% cheaper than fired bricks, consuming half of the water and only 5 - 6% of cement.

The scale-up dissemination and implementation of SSB technology is undertaken by national NGOs in collaboration with popular committees, youth organisation and local authorities. It is accompanied by clear policy lending of SSB machinery for public facilities construction and self-help housing, and go even further by lending SSB on credit to vulnerable beneficiaries. As a result, the affected community is expected to become more resilient to flood disaster and better prepared to cope with flood management in an effective way, based on community flood action plan.

Project outputs

The experiences and lessons learned offer a transition from piloting projects to consolidation of achievements and ultimately to the scale-up phase and replication within the context of the Sendai Framework for Disaster Risk Reduction 2015-2030. In this respect, the project is geared to reduce disaster risk and build resilience to hazards – including unplanned and rapid urbanisation, demographic changes, weak institutional arrangements – and to integrate, as appropriate, both disaster risk reduction and resilience strategies into policies, plans, programmes at all levels.



Youth Training for SSB production as flood resistant construction material.
© UN-Habitat Sudan

Partners:

UN-Habitat Country Office - Lebanon
Union of Municipalities

Donors:

UN-Habitat

Hazard addressed:

Weak governance
Shelter and basic services needs



MAP 3.3: UN-Habitat Programme in Lebanon.

City Profiles

Methodology

UN-Habitat City Profiles are a multi-sectoral spatial tool applied in Lebanon – and other countries in the MENA – in order to enhance the understanding of urban vulnerabilities in specific cities, inform potential responses and increase the capacity to respond to stresses. Developed in close collaboration with local municipalities, humanitarian partners, Unions – such as the Unions of Municipalities – and other stakeholders, the Profiles are based on currently available data and will be updated to take account of new information. Data collection – mainly desk-based, with some additional primary data collection and surveying where necessary – include material from UN-Habitat Neighbourhood Profiles – gathered at a lower scale through field-based research – as well as reported activities of humanitarian and crisis-response partners from 2016 and beyond. Falling in the category of ‘area-based’ approaches, characterisable not only as geographical and multi-sectoral but also participative, UN-Habitat City Profiles are developed through a collaborative and consultative process that engages the local authorities (unions of municipalities and municipalities), NGOs and other UN agencies. ‘Round tables’ facilitated by the UN-Habitat Country Office are convened by the local authorities at key profile development stages, for consultation and validation purposes. Information and validation is gained from services providers as well as from the humanitarian actors working in the analysed territory.

The project in detail

UN-Habitat City profiles are mainly concerned with the status of urban infrastructure and services, as well as how these interplay with the distribution and socio-economic characteristics of host and refugee population across the city. The analysis is structured around four main themes, namely space, governance, population and services (the latter divided into economy, basic urban services and social services). Building upon an outline of the city’s historic and developmental context, the four themes are enquired more in detail with supplementary considerations at both the national and metropolitan scale. Finally, conclusions are drawn based on both research findings and policy implications, incorporating a set of suggested projects of potential strategic impact which may tackle some of the challenges identified.

Project outputs

UN-Habitat City Profiles are formulated to offer a cross-sectoral perspective on urban vulnerabilities that will inform interventions by local authorities, humanitarian agencies and others bodies, in order to improve the resilience of the analysed cities and foster sustainable urban development trajectories. The findings of these in-depth analyses are also meant to foster an analytical knowledge base that will facilitate nuanced, medium to long term, public sector planning and investment agendas.

Regional Technical Offices: Improving Municipal Planning & Enhancing Local Governance

Methodology

The Regional Training Officers (RTOs) is a Lebanese unit comprising local experts and technical persons, and performing under the mandate of the Union of Municipalities. With activities spanning across planning, mapping, capacity building and technical assistance, the RTOs aim at mobilising public and civil local actors to collectively address local needs based on available resources, as well as to enhance coordination across Lebanese municipalities to face common challenges.

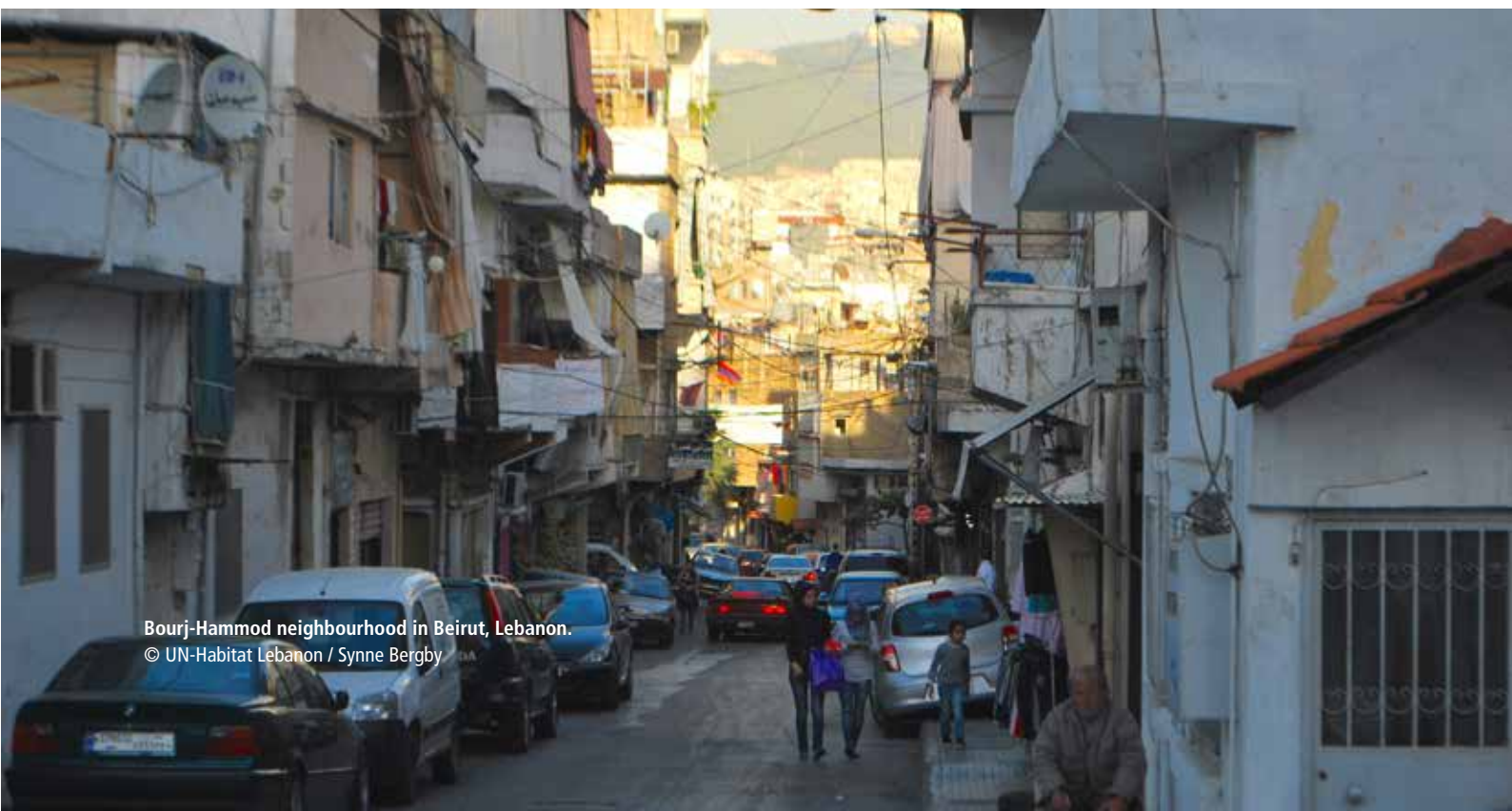
The project in detail

UN-Habitat Country Office for Lebanon established the RTOs in order to respond to the Israeli war on Lebanon in 2006 and to the Syrian crisis in 2011. The RTOs perform under the mandate of the Unions of Municipalities and aims to strengthen local governance, enhance service delivery and mainstream planned interventions. In a country marked by weak governance, and suffering from an increased demand on shelter and basic services, crisis response can often be a challenge. In this context, RTOs were established as local official structures, to assess municipal priorities and develop adequate responses in strong connection with community representatives,

local authorities, public service providers and international organisations. As such, the RTOs play a critical role in facilitating multi-scale coordination, promoting regional planning at the level of Union for Municipalities, proposing joint municipal projects as multi-sectoral solutions, and enhancing a perspective shift from emergency response to recovery and planning. The RTOs are often considered to be an exemplary pilot model to foster institutional resilience in the face of on-going crisis.

Project outputs

The RTOs enhance data management and cost efficiency – within and for the Unions – support Municipalities technically, facilitate international donor interventions, strengthen community integration and municipal engagement, empower Unions through offering qualified experts and enhance decision making.



Bourj-Hammod neighbourhood in Beirut, Lebanon.
© UN-Habitat Lebanon / Synne Bergby

City Resilience Action Planning (CityRAP) Tool

Partners:

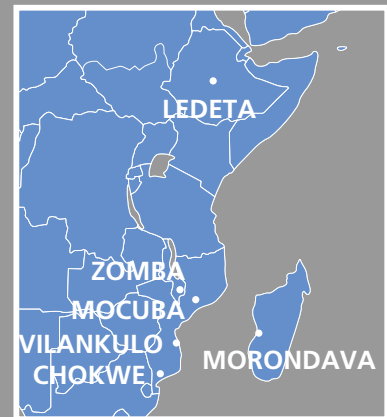
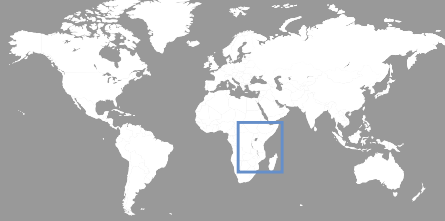
DiMSUR
Urban ARK

Donors:

GFDRR
ECHO
Development Account – United Nations Secretariat

Hazard addressed:

Natural and anthropogenic shocks and stresses



MAP 3.3: UN-Habitat Programme in Sub-Saharan Africa.

Methodology

The CityRAP tool methodology seeks to put local governments and urban stakeholders in the driver's seat of urban resilience planning in order to ensure capacity retention and further use. The standard process lasts around 2 months and is composed of 4 phases. In each phase a different task is carried out by the municipality:

Firstly, an intensive training on urban resilience takes place in the municipality; secondly, the municipality collects data through participatory and practical methods to leverage local knowledge; thirdly, information is analysed and discussed collectively with local stakeholders for selecting key issues to be tackled in the process of building resilience; and finally, the municipality elaborates a city Resilience Framework for Action, based on the issues prioritised, through a step-by-step methodology.

The project in detail

The CityRAP Tool is a set of activities and exercises that provide local governments with a clear path for mainstreaming resilience and adaptation into urban development and for defining and implementing key interventions for building resilience. The Tool specifically targets small and intermediate cities and is designed so that local governments can adapt and implement it with minimal intervention from outside technical experts, leveraging local knowledge to resilience strengthening activities. These include local government self-assessments, participatory risk mapping and planning exercises, and cross-sectorial

action planning – all which can be done by the local government, engaging relevant stakeholders and communities in particular. In this way, the CityRAP Tool aims to support, facilitate and complement the development processes underway and reinforce existing capacities in order to ensure retention and use of resilience planning methods and practices.

Project outputs

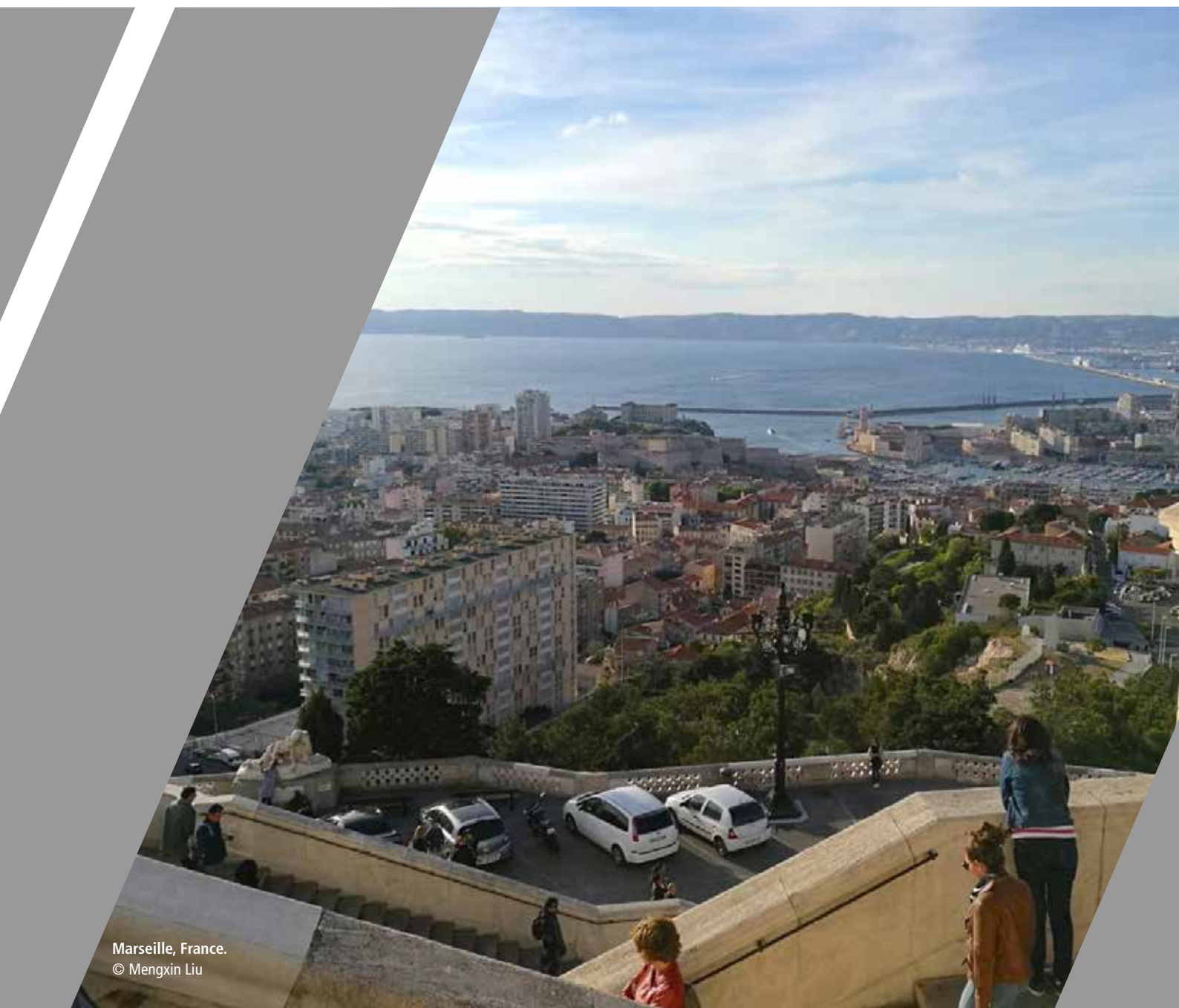
The CityRAP has been carried out in 6 cities so far: Chokwe, Vilankulo, Mocuba (Mozambique), Zomba (Malawi), Morondava (Madagascar) and the suburb of Ledeta in Addis Ababa (Ethiopia). It is estimated that 900 to 1000 people took part directly at the various activities conducted in these cities.

The Resilience Framework for Action is the standard final product of the CityRAP tool process. As a reference document it allows local governments and other institutions to mainstream resilience into their existing and future policies, plans, budgets, institutional set-ups and actions. The Resilience Framework for Action is based on an assessment of the status quo regarding the priority issues selected by municipal authorities, community representatives and other stakeholders.

Importantly, the final output of the CityRAP can be adapted to respond to the demand of the target municipality and may take various forms (e.g. strategies, urban plans, pilot projects, amongst other).

NOTES

1. UN-Habitat (2017a).
2. UN-Habitat (2017b).
3. UNISDR (2017).
4. RESCCUE (2017).
5. Global Alliance for Urban Crises (2016).
6. IASC (2017).
7. Sustainable Development Knowledge Platform (2017a).
8. Sustainable Development Knowledge Platform (2017b).
9. United Nations General Assembly (2017).



Marseille, France.
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CHAPTER 4

Global Resilience Actors



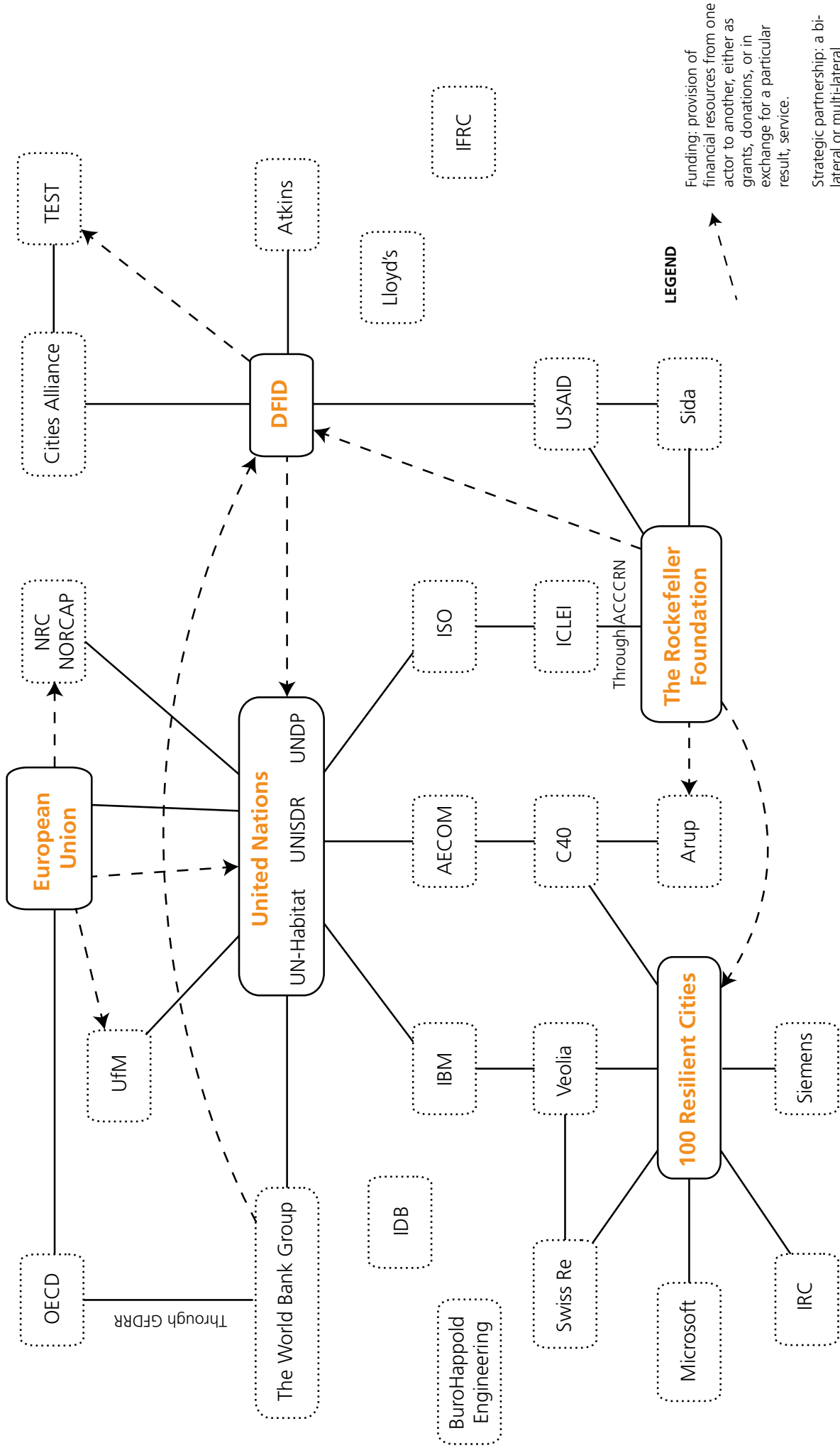
CHAPTER 4

Global Resilience Actors

As the importance of engaging with a plurality of actors becomes a common thread in various agendas for urban development, resilience thinking, in its encounter with urban sustainability, has the unprecedented capacity to attract a wide variety of global, regional and local stakeholders onto common ground. However, in order to fully leverage this cross-sectoral and multi-scale network of actors, considerable efforts for coordination and interaction are needed.

The chapter is framed across two sections. Firstly, mapping a Global Network of Actors, it graphically portrays the main stakeholders involved in activities related to urban resilience. These include some United Nations' bodies, governmental, inter-governmental and non-governmental organisations, a diverse range of private actors, philanthropic foundations, academic institutions and research institutes. Moreover, it explores the degree of engagement, interconnectivity and interdependency among them, seeking to provide a brief yet comprehensive snapshot of this diverse spectrum. Actors are categorised across four major clusters – 1) United Nations System and the European Union Network, 2) The Rockefeller Foundation and 100 Resilient Cities Network, 3) The United Kingdom Department for International Development Network, and 4) De-linked Actors – according to funding sources, tool implementation and shared purposes. Each of the aforementioned clusters is unpacked through detailed profiles, investigating each actor's understanding of resilience, as well as their formal and practical commitment to the subject. Secondly, the chapter analyses existing global and regional alliances and partnerships related to the resilience field.

FIGURE 4.1: Global Network of Actors.



LEGEND

Funding: provision of financial resources from one actor to another, either as grants, donations, or in exchange for a particular result, service.

Strategic partnership: a bilateral or multi-lateral agreement among two or more actors to share expertise, knowledge or resources in order to pursue a common goal.

This network of relationships between actors is not exhaustive and solely shows relationships mentioned in the third and fourth chapters of the publication. The network only includes relationships established through projects, initiatives, programmes et cetera with a link to urban resilience.

4.1 NETWORKS OF RESILIENCE ACTORS

4.1.1 United Nations System and the European Union Network

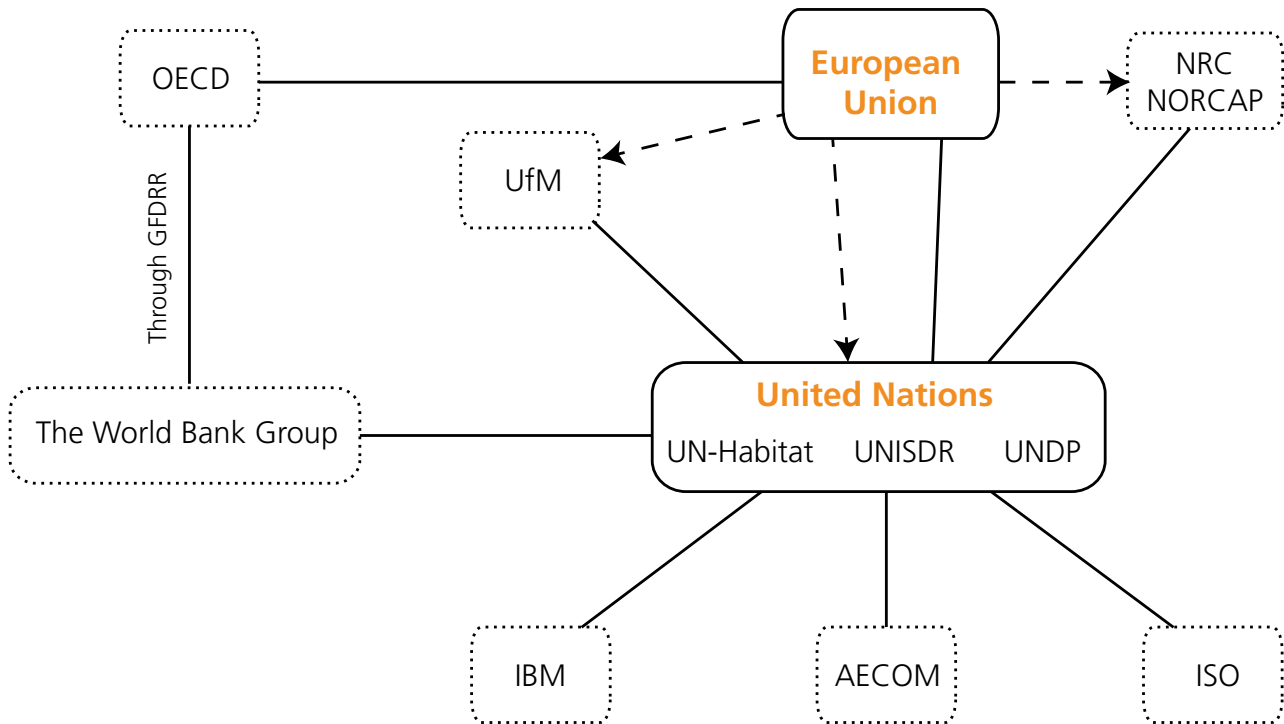


FIGURE 4.2: United Nations System and the European Union Network.

United Nations Development Programme



ID: The United Nations Development Programme (UNDP) was established in 1966, merging the United Nations Expanded Programme of Technical Assistance and the United Nations

Special Fund. Currently active in nearly 170 countries, the agency aims to eradicate poverty and reduce inequality and exclusion. It therefore supports national governments in developing policies, leadership skills, partnering abilities and institutional capacity, as well as in building resilience in order to sustain development results.



Commitment to Resilience: Whilst the UNDP’s diversified approach to the subject has not been designed as part of a single framework of action, the agency’s commitment to resilience appears to

primarily unfold through the following four lines of work: 1) disaster risk reduction, 2) climate change, 3) recovery, and 4) community and social cohesion.

Since 2005, over USD 1.7 billion has been invested in disaster risk reduction and recovery, and UNDP currently holds a portfolio of USD 1.7 billion to foster risk-informed, sustainable and resilient development policies. The agency has been committed to working closely with local and national governments, in order to increase multi-layered capacity building and resilient solutions across 60 countries, with regards to hydro-meteorological and geophysical hazards. Similarly, as the largest provider of climate change adaptation and mitigation measures within the UN system, the agency has proven to be determined to build climate resilience, supporting countries in their transition toward low-emissions and environmentally resilient and sustainable development¹.

Moreover, in its endeavour to shift from short-term relief to forward-looking recovery, UNDP has been active in post-disaster recovery efforts worldwide – not just restoring pre-existing conditions but taking the reconstruction phase as an opportunity to address drawbacks and build back better. Since 2008, the

agency has also joined forces with the European Union and the World Bank, collaborating on Post-Disaster Needs Assessment and Disaster Recovery Framework tools, both of which aim to streamline the post-disaster process with the concepts of resilience and sustainability.

Finally, over the past few years, the agency has been showing increasing interest in and commitment to a more qualitative and community-based approach to resilience. In 2012, UNDP published the Community-Based Resilience Analysis tool, with the aim of measuring and identifying the key building blocks of community resilience, as well as assessing various humanitarian interventions in attaining these characteristics. The qualitative participatory assessment

methodology proposed by the Community-Based Resilience Analysis tool is one of the first practical analytical tools developed to identify indicators for community resilience, and it is therewith designed as a support to stakeholders in policy, strategy and programme or project planning.



Understanding of Resilience: Moving from a comprehensive understanding of shocks and stresses, UNDP defines resilience as *a transformative process of strengthening the capacity of men, women, communities, institutions, and countries to anticipate, prevent, recover from, and transform in the aftermath of shocks, stresses, and change.*

United Nations International Strategy for Disaster Reduction



ID: The United Nations International Strategy for Disaster Reduction (UNISDR) was established in 1999 as a dedicated secretariat to facilitate the implementation of the International

Strategy for Disaster Reduction. As the United Nations Office for Disaster Risk Reduction, UNISDR is responsible for supporting the implementation, follow-up and review of the Sendai Framework for Disaster Risk Reduction (Sendai Framework)².



Commitment to Resilience: In 2010, UNISDR launched the Making Cities Resilient campaign to support the building of resilience and increasing local level understanding of disaster risk within

cities³. As part of the campaign, UNISDR pioneered the Local Government Self-Assessment Tool (LGSAT) – a system which provides key measurements against the Ten Essentials for Making Cities Resilient which were developed in line with the Hyogo Framework for Action 2005-2015 (HFA).

The Ten Essentials form the basis of a city's commitment toward improving their resilience to disasters, and is the organising structure around which good practices, tools, resources and frameworks for reporting and monitoring progress are shared. The Ten Essentials are:

1. Organise for disaster resilience
2. Identify, understand and use current and future risk scenarios
3. Strengthen financial capacity for resilience
4. Pursue resilient urban development and design
5. Safeguard natural buffers to enhance the protective functions offered by natural ecosystems
6. Strengthen institutional capacity for resilience
7. Understand and strengthen societal capacity for resilience
8. Increase infrastructure resilience
9. Ensure effective disaster response
10. Expedite recovery and build back better.

The LGSAT was developed to help cities set baselines, identify gaps and have comparable data across local governments, within the country and globally, and to measure advancements over time. Building on this foundation, the UNISDR later developed the Disaster Resilience Scorecard – a collaborative effort with engineering firm AECOM and technology firm IBM – to measure the resilience of cities to disasters⁴. Modelled after the Ten Essentials, the Scorecard identifies existing gaps and challenges in disaster risk reduction for cities with the aim to develop action plans that improve resilience over time. The Scorecard includes over 80 individual assessment questions – each scored on a scale of 0 (worst practice) to 5 (best practice) – on topics including policy and planning,

engineering, informational, organisational, financial, social and environmental aspects of disaster resilience. In this regard, the Scorecard provides greater level of detail than the LGSAT, providing a more quantitative baseline and designed to build on any work previously done by cities with the LGSAT⁵.

Similarly, UNISDR continues to promote the collaboration between the public and private sector in leading disaster risk reduction. Consequently, in 2015 after the international community adopted the Sendai Framework for Disaster Risk Reduction 2015-2030, several private sector initiatives within the UNISDR were merged to create the Private Sector Alliance for Disaster Resilient Societies (ARISE). With an initial membership of over 140 private sector entities and affiliates, the Alliance aims at increasing the number of private sector organisations and other actors involved in supporting the implementation of the Sendai Framework, as well as allowing the private sector to implement tangible projects and initiatives that deliver results critical to achieving Sendai Framework's goals. Moreover, the Alliance facilitates the exchange of experience and knowledge on how to implement tangible disaster risk reduction projects through seven

work streams: a) disaster risk management strategies, b) investment metrics, c) benchmarking and standards, d) education and training, e) legal and regulatory, f) urban risk reduction and resilience, and g) insurance.

Finally, UNISDR is also part of the Medellin Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellin, Colombia in 2014. The MCUR includes UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance.



Understanding of Resilience: UNISDR works on resilience via the entry point of disaster risk reduction, defining the concept as *the ability of a system, community or society to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.*

World Bank



ID: The World Bank – which is part of the World Bank Group – provides financial and technical assistance to developing countries for capital programmes aimed at ending world poverty and boosting shared prosperity. The Bank provides low interest loans, zero to low interest credits and grants across a wide range of sectors. Through coordination with governments, other multilateral organisations and private actors, the Bank helps to foster investments in education, health, public administration, infrastructure, financial and private sector development, agriculture, and environmental and natural resources management⁶.



Commitment to Resilience: As part of the United Nations Family, the World Bank subscribes to the Post-2015 Development Framework and is determined to build resilience at a multi-scalar level. Its commitment has been unfolding in multiple directions, spanning a wide array of fields and institutional bodies within its structure.

In 2006, to support the implementation of the Hyogo Framework for Action 2005-2015, the World Bank Group launched the Global Facility for Disaster Reduction and Recovery (GFDRR)⁷. The organisation is a partnership between 36 countries and 11 international organisations, established to assist developing countries in reducing their exposure to natural hazards and climate change. It is managed by the World Bank Group on behalf of GFDRR's donors and partners, and works as a grant-making facility tasked to understand risk, improve disaster governance, emergency preparedness and recovery in developing countries, and invest in disaster risk reduction for resilience.

Furthermore, from 2011 onwards, the World Bank has provided staff and consultants to GFDRR's Open Data for Resilience Initiative. The initiative aims to promote a global open data movement in order to facilitate reducing vulnerability to natural hazards and the impacts of climate change. The Initiative supports the World Bank's Regional Disaster Risk Management Teams to build capacity and foster long-term ownership of open data projects through the sharing, collecting and using of data.

BOX 4.1: The World Bank Group.

The World Bank Group includes five institutions, namely the International Finance Corporation, the Multilateral Investment Guarantee Agency, the International Centre for Settlement of Investment Disputes, the International Bank for Reconstruction and Development, and the International Development Association. The latter two make up the World Bank.

The World Bank Group is also part of the Medellín Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellín, Colombia in 2014. The MCUR includes UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance.



In 2013, the Bank launched the *Resilient Cities Program* – a multi-year initiative to help cities increase their ability to prepare for and adapt to changing conditions, as well as to withstand and recover rapidly from disruptions related to climate change, natural disasters and other systemic shocks. The Program provides the framework for the Bank to analyse and support the need for local governments to streamline resilience into broader urban management agendas⁸. The Bank collaborated with the Global Facility for Disaster Reduction and Recovery (GFDRR) to develop the *CityStrength Diagnostic*, a tool aimed at engaging cities to assess their resilience to hazards, and to assist with long-term investment and policy options. The tool is designed to be used by expert consultants, and thus evaluates resilience on a sectoral basis. Designed to be used in any size city, the *CityStrength Diagnostic* is structured around a wide array of modules, including: Community and Social Protection, Disaster Risk Management, Education, Energy, Environment, Health, Information and Communications Technology, Local Economy, Logistics, Municipal Finance, Solid Waste, Transport, Urban Development, and Water and Sanitation. To this end, the Diagnostic consists of five stages to identify critical gaps or areas of weakness, and to unlock opportunities for enhancing resilience in a city⁹.

1. Stage one – pre-diagnostic review: review and synthesise what has already been studied in the city. Compile data and prepare base maps.

2. Stage two – launch workshop: get stakeholders together, explain the process, share and confirm findings of the data collection stage, and define/confirm shocks and stresses.
3. Stage three – interviews and field visits: talk to local experts, officials, community members, and conduct site visits.
4. Stage four – prioritisation: working session to share sectoral findings and agree on priorities and follow-on actions to recommend.
5. Stage five – discussion and next steps: meeting with local leaders to summarise findings of the diagnostic and agree on priorities and next steps.

As of October 2016, the World Bank published – in collaboration with GFDRR – *Investing in Urban Resilience: Protecting and Promoting Development in a Changing World*. The report, which illustrates how building urban resilience is critical to reducing poverty and promoting shared prosperity, provides a thorough mapping of both the main obstacles and opportunities for financing urban resilience globally; showing how the World Bank and other multilateral development institutions can play a critical role in enabling city and national governments to leverage private sector investments in the field. Over the last five years, the World Bank has financed more than USD 9 billion in projects to help cities in 41 countries becoming more resilient, significant investment gaps remain¹⁰.

Moreover, the World Bank Treasury has been very active in building up resilience worldwide. As the financial body of the International Bank for Reconstruction and Development, the Treasury has gained a global reputation as a borrower, investor and risk manager, specialising in loans, contingent financing, guarantees, hedging products, and disaster risk financing for development programs. In this regard, the World Bank Treasury partners with 100 Resilient Cities: by providing partner cities with technical assistance to transfer part of their catastrophic risk, the Treasury assists with obtaining financial assets in the aftermath of a given shock.



Understanding of Resilience: The World Bank's approach to urban resilience is well aligned with the Post-2015 Development Framework, based on the understanding of cities as a complex system of systems. The agency views resilience as dependent on the smooth functioning of smaller constituent elements within the larger organisation in which they are nested. It describes resilience as *the ability to prepare for and adapt to changing conditions, as well as to withstand and recover rapidly from disruptions related to climate change, natural disasters and other systemic shocks.*

European Commission - DG-DEVCO



ID: As a European Commission unit, the Directorate General for International Cooperation and Development (DG-DEVCO) is responsible for designing and implementing the European

Union's external policies in matters of international cooperation and development, with the ultimate goal of reducing world poverty. In order to ensure sustainable development and promote democracy, peace and security, DG-DEVCO relies upon a tight network of local and international partners, from civil society organisations to EU national parliaments, and from the private sectors to international organisations, particularly the United Nations, the World Bank and the Organisation for Economic Co-operation and Development (OECD)¹¹.



Commitment to Resilience: The European Commission's and DG-DEVCO's commitments to resilience should be contextualised in the broader effort of bridging the gap between

humanitarian aid and long-term development policies, as elucidated in various policy documentations from the *Linking Relief, Rehabilitation and Development*¹² assessment (2001) to the *Agenda for Change*¹³ (2011). Within this framework, resilience has been addressed more directly and constantly since 2012: firstly, drawing upon previous achievements in the field of food security – *The EU approach to resilience: learning from food crises* – and secondly, expanding that approach to other critical areas, such as conflict, insecurity, weak democratic governance, economic shocks, natural hazards and climate change¹⁴. This

12-year path paved the way for the *Action Plan for Resilience in Crisis Prone Countries 2013-2020* – developed in cooperation with the European External Action Service – which provides the framework to increase the EU's efforts for resilience building across various sectors, regions and levels. The EU Resilience Action Plan is also reinforced by the pre-existing Disaster Risk Reduction Plan (2011), all the while being both well aligned with the Millennium Development Goals, the Hyogo Framework for Action and the Post-2015 Development Framework.

Consequently, in July 2016, the European Commission launched a joint initiative with UN-Habitat and UNISDR. Through DG-DEVCO, the European Commission delivered an initial EUR 6 million grant for the next three years to the two UN agencies, in order to reduce vulnerability and disaster losses in some of the most hazard-prone cities in the world¹⁵. This financial aid will support the *Making Cities Resilient* campaign and the City Resilience Profiling Programme, coordinated by UNISDR and UN-Habitat respectively, and both tasked to enhance disaster risk reduction and resilience.



Understanding of Resilience: Strongly emphasising the need for a cross-sectoral, people-centred and context-based approach, the European Commission sees resilience as *the ability of an individual, a household, a community, a country or a region to withstand, adapt, and quickly recover from stresses and shocks*¹⁶.

European Commission - RESCCUE Project



ID: The RESCCUE Project – *RESilience to cope with Climate Change in Urban arEas: a multi-sectoral approach focusing on water* – was launched in 2016, with the scope of helping cities

around the world to face physical, social and economic stresses or shocks, taking the water sector as its entry point to urban systems. The project – which gathers a consortium of seventeen partners – benefits from funding from the European Union, delivered through its Horizon 2020 framework.

As the biggest European Union Research and Innovation programme ever, with nearly EUR 80 billion in funding available over a period of 7 years (2014 to 2020) – Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness¹⁷. By coupling research and innovation, Horizon 2020 puts great emphasis on excellent science, industrial leadership and tackling societal challenges, ensuring Europe produces world class science, removes barriers to innovation and makes it easier for the public and private sectors to collaborate in delivering innovation.



Commitment to Resilience: At the heart of the RESCCUE project is the HAZUR® tool: a diagnostic instrument designed by Opticits that evaluates urban services and critical infrastructure status

under both chronic and extraordinary stress. While the tool has already been tested experimentally in

three small-to-medium sized Spanish urban centres – Olot, Tremp and the Forum District from Barcelona Metropolitan Area – its further development and implementation in larger cities will be supported by partners from the non-governmental, the public and the private realm, collaboratively accompanying Opticits, with knowledge and expertise, across various sectors.

The three pilot cases for the tool – Lisbon, Bristol and Barcelona – were selected from their climate types and urban characteristics, as well as because they previously suffered from water-related disturbances. The cities are now consortium partners with RESCCUE to assess their vulnerabilities and become more resilient. Once the existing HAZUR® tool is applied and validated in the three cities, the consortium will jointly develop a Resilience Action Plan for each urban centre. These plans will be informed by the outcomes of the diagnostic process and will leverage local and international stakeholders, in order to design innovative frameworks for public-private partnerships.



Understanding of Resilience:

Leveraging the knowledge and expertise of its diverse spectrum of members, the RESCCUE consortium envisages a multi-sectoral and holistic approach to urban resilience which – using water as its entry point – investigates the interconnections between climate change and local urban challenges, as well as the potential cascade effects linked to any given hazard.

BOX 4.2: RESCCUE Consortium Members.

Águas de Portugal, SGPS, S.A., Portugal
Ajuntament de Barcelona, Spain
Aquatec, Proyectos para el sector del Agua S.A.U., Spain
Bristol City Council, United Kingdom
Câmara Municipal de Lisboa, Portugal
Cetaqua, Centro Tecnológico del Agua, Fundación privada, Spain
Ecole des Ingenieurs de la Ville de Paris, France
EDP Distribuição - Energia S.A., Portugal
Endesa Distribución Eléctrica, S.L., Spain

Fundació Institut de Recerca en Energia de Catalunya, Spain
Fundación para la Investigación del Clima, Spain
Hidra - Hidráulica e Ambiente Lda., Portugal
Laboratório Nacional de Engenharia Civil, Portugal
Opticits Ingenieria Urbana S.L., Spain
United Nations Human Settlements Programme, Kenya
University of Exeter, United Kingdom
Suez Advanced Solutions UK Limited, United Kingdom
Urban DNA Solutions LLP, United Kingdom

AECOM



ID: AECOM is an American multinational engineering firm providing a wide array of technical and support services ranging design, consultancy, construction, and management. The company operates in a variety of markets, including transportation, facilities, environmental, energy, water and government¹⁸.



Commitment to Resilience: AECOM has designed and delivered more than 200 climate adaptation and resilience projects for private and public clients – at local, regional, national and international scales – focused on climate hazards, risk, vulnerability and sustainability. Through partnerships with a diverse range of organisations, AECOM carries out practical work through various programmes on building climate resilience of communities worldwide.

In collaboration with UNISDR, the company has co-created the *Disaster Resilience Scorecard*, to evaluate degrees of preparedness for natural disasters, related to UNISDR's *Ten Essentials for Making Cities Resilient*¹⁹. Currently, AECOM works with multiple cities signed up to this campaign by facilitating the implementation of the Scorecard. Moreover, as a key strategic partner of 100 Resilient Cities (100RC), the company has provided services to several cities in the 100RC network including Christchurch, Quito, Rome and

San Francisco, facilitating workshops and developing resilience strategies²⁰.

AECOM also partners with non-governmental and intergovernmental organisations, namely CDP (formerly the Carbon Disclosure Project) and the C40 Cities Climate Leadership Group (C40), to help cities and companies develop strategic approaches to climate change, that is, reducing carbon emissions while growing their economies. Furthering this private sector commitment, in 2015 AECOM published the *Becoming Climate Resilient* report, putting forward a business case for companies to make strategic investments to become more climate resilient²¹. Within the report, AECOM introduced the *Climate Resilience Framework* – a six-step process to help businesses develop and increase resilience to climate-related hazards and review performance against business objectives and sustainability. The steps are 1) scoping, 2) screening risk, 3) applying science, 4) detailed risk assessment, 5) resilience options, and 6) implementation.



Understanding of Resilience:

AECOM upholds a systems approach to resilience – defining it as *the ability of human settlements and organisations to withstand, recover quickly from and continue to prosper in the context of increasing impacts of natural and man-made hazards or disasters*.

IBM



ID: The International Business Machines Corporation, commonly referred to as IBM, is an American multinational technology and consulting corporation, with a thorough expertise in working with cities of all sizes, helping to solve various urban challenges. Through the collection of large amounts of data, analytics, mobile and social computing, IBM aims to help with the development of more sustainable and resilient cities with a people-centred approach²².



Commitment to Resilience: Along with the United Nations Office for Disaster Risk Reduction (UNISDR), and global planning, design and engineering

firm AECOM, IBM has co-developed the *Disaster Resilience Scorecard* to quantitatively measure cities' resilience to disasters. Modelled after the *Ten Essentials* of UNISDR's *Making Cities Resilient Campaign* the Scorecard gauges a city's current status quo, to identify existing gaps and challenges in disaster risk reduction and to develop action plans to improve resilience over time. As part of UNISDR's Private Sector Advisory Group, IBM along with AECOM are part of a platform of over 70 companies committed to disaster resilience. It was through this cooperation that AECOM and IBM collaborated on a pro bono basis. Specifically, disaster resilience is the central nexus area of the Scorecard's assessment – adhering to the norms of the Hyogo Framework for Action and the Sendai Framework²³.

In parallel, IBM is working on *Smarter Cities*²⁴ – an initiative created to identify, strengthen and integrate technological components within cities – thereby building the resilience of cities through cognitive government. To date, *Smarter Cities* is serving thousands of urban areas around the world addressing a wide array of sectors including, public safety, health and human services, education, infrastructure, energy, water, and environment. To this end, IBM collaborates with seven core partners that offer complementary solutions for cities, namely AECOM, Badger Meter, Cisco, Esri, Telvent and Veolia.

Finally, the corporation developed the Incident Response Platform which aims to help organisations and businesses to avoid and react to cyberattacks. The Platform enables collaboration between the different departments of a business or organisation. As part of the programme, IBM also developed

Dynamic Playbooks, based on best practices and expert knowledge, which provide response plans and guidance on prioritisation of action regarding 18 types of incidents.



Understanding of Resilience: As a technological company, IBM's resilience lens stems from a business and cyber security perspective – *the ability to rapidly adapt and respond to business disruptions and to maintain continuous business operations, be a more trusted partner, and enable growth.* However, through its membership within the UNISDR's Private Sector Advisory Group and its partnership with AECOM in developing the Scorecard, it is fair to say the company is also engaging with broader notions of disaster resilience.

International Organization for Standardization



ID: Founded in 1947, the International Organization for Standardization (ISO), is a non-governmental, independent body based in Geneva. It consists of an approximate 3,400 technical committees,

or expert groups that carry out the preparation of standards, and includes 163 member countries of which 119 have the right to influence and vote on standards development. Over the past 70 years, ISO has developed and set more than 21,000 voluntary, consensus-based international standards concerning technology, manufacturing, health and other industries²⁵.



Commitment to Resilience: The International Organization for Standardization's commitment to resilience is embodied by its Technical Committee (TC) 268 for Sustainable

Cities and Communities, which was created in 2012 and includes 29 participating and 22 observing countries, as well as several contributing organisations such as UNISDR, United Nations Environment Programme (UNEP) and ICLEI. Going beyond cities to include rural areas, the TC 268 aims to develop requirements, frameworks, guidance and supporting techniques and tools to help all cities and communities achieve sustainable development considering smartness and resilience, as such contributing with its standardisation work to the Sustainable Development Goals. Since its conception, the TC has published

several International Standards, of which the indicators address sustainable development as well as resilience although they do not explicitly refer to the concept²⁶. In December 2016, however, ISO released its first standard wordily mentioning resilience, i.e. *ISO/TR 37121 – Inventory of existing guidelines and approaches on sustainable development and resilience in cities*. The document includes guidelines and approaches selected based on their social, economic and environmental contributions towards sustainable and resilient cities, like UNISDR's *Ten Essentials*, yet it is not intended to be an exhaustive inventory. Furthermore, the TC 268 is currently developing a standard, *ISO 37123 – Indicators for Resilient Cities*, that will contain definitions and methodologies on which – coupled with the guidelines and approaches in the ISO 37121 – to base the establishment of resilience indicators. Said indicators will assist cities in assessing the extent to which they are helping residents, businesses, institutions, and infrastructure reduce risk, prepare for emergency and plan for long-term resilience²⁷.

Also, in 2015, the International Organization for Standardization created a second technical committee concerning resilience, namely TC 292 for Security and Resilience, which merged three pre-existing committees into one – TC 223 Society security, TC 247 Fraud countermeasures and controls, and Project Committee (PC) 284 Management system for quality of private security company operations. TC 292 has over 60 member countries to date and

liaises with organisations such as UN-Habitat, UNISDR and the Asian Disaster Reduction Centre to develop standards within the field of security, in order to enhance the safety and resilience of society. Through the establishment of a forum of international expertise the committee aims to generate consensus-based standards that enhance society's awareness and capabilities, further national and international trade by increasing the reliability of supply chains, and improve the agility, flexibility and adaptive capacity of organisations. Since its conception in 2015, TC 292 has already published 25 international standards, including for instance *ISO 22315 – Societal security – Mass evacuation – Guidelines for planning*, *ISO 22325 – Security and Resilience – Emergency Management – Guidelines for capability assessment*, and *ISO 28002 – Security management systems for the supply chain – Development of resilience in the supply chain – Requirements with guidance for use*. Furthermore, 15 more standards are currently under development, amongst which one for building community resilience – *ISO 22319 – Security and Resilience – Community Resilience – Guidelines for planning the involvement of spontaneous volunteers* – as well as one concerning business continuity – *ISO 22331 – Security and*

Resilience – Business continuity management systems – Guidelines for business continuity strategy. Thus, whereas TC 268 is primarily concerned with the development of indicators to measure urban resilience, TC 292 mainly publishes guidelines and requirements to advance certain aspects of the urban system as well as foster stakeholder engagement.



Understanding of Resilience:

The International Organization for Standardization interprets societies as reliant on a web of institutions, infrastructure and information which may be threatened and challenged by all kinds of shocks and stresses such as climate change, natural disasters, food, water and energy insecurity, disease, economic fluctuation, terrorism and social unrest. It defines resilience as *the ability of a city, system, community, local government or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner*, including through preserving and restoring its essential basic infrastructure and functions.

Norwegian Refugee Council



ID: The Norwegian Refugee Council (NRC) is an independent humanitarian organisation, whose principal mandate is to promote and protect the rights of all people who have been forced to flee their

homes – within or out of their countries – providing them with food assistance, clean water, shelter, legal aid and education. This will be achieved by acting as an independent and courageous spokesman for refugee rights nationally and internationally, by providing humanitarian assistance in difficult situations, as well as by strengthening the capacity of United Nations organisations to offer and coordinate international aid and protection²⁸. As a non-profit organisation, the NRC depends on donations, provided mainly by five agencies, amongst which the Swedish International Development Cooperation Agency (Sida), the UK Department for International Cooperation (DFID) and the European Civil Protection and Humanitarian Aid Operations (ECHO).



Commitment to Resilience: The Norwegian Refugee Council's commitment to resilience – which focuses mainly on disaster risk management and

climate change adaptation – relies extensively on the role of NORCAP (Norwegian Capacity to International Operations): a Standby Personnel roster organisation, operated by the Council, tasked to improve international and local capacity to prepare for, respond to and recover from crises.

Established in 1991 and leveraging the knowledge and expertise of over 900 professionals, NORCAP's mandate: a) enhances the international community's capacity to prevent and respond to future and current humanitarian crisis; b) guarantees that international efforts are carried out without consideration of religion, race, nationality and political persuasion; c) supports international capacity – and particularly the United Nations – from response to prevention and from post-conflict to sustainable development challenges; and d) ensures that people in emergencies receive protection and assistance according to their need and rights²⁹.

The Norwegian Refugee Council has been continually engaged in building the resilience of cities and communities, both regarding the environmental stresses produced by climate change and the shocks generated by disasters. A relevant case for this is provided by the non-profit organisation's

activities in the Sahel and East Africa region, where NORCAP has been particularly active at the local, national and regional level, in order to both prevent and tackle the impacts that drought and flooding can have on local communities³⁰. Similarly, the Council has also been active in projects of urban integration and development, especially during the current global refugee crisis.

Based on the shared belief that victims of disasters and other emergencies receive adequate humanitarian assistance, as well as on previous successful collaborations, the Norwegian Refugee Council and

UN-Habitat signed a Memorandum of Understanding in July 2010, according to which experts from the NORCAP roster assist UN-Habitat's work on cities, concerning humanitarian crises.



Understanding of Resilience: From a humanitarian perspective, the Norwegian Refugee Council refers to the resilience of people, communities and countries as *the ability to anticipate, prevent, manage and recover from crises*, with an emphasis on climate change adaptation and disaster management.

Organisation for Economic Co-operation and Development



ID: The Organisation for Economic Co-operation and Development (OECD)³¹ is an international platform established in 1961 and gathering 35 countries worldwide plus the European Commission. With up to 250 committees, working groups and expert groups, OECD provides a unique forum for representatives of the member countries to identify, discuss, analyse and tackle common issues concerning specific policy areas such as economics, science, employment, education and financial markets.



Commitment to Resilience: Resilience has been gaining prominence in the OECD's agenda, ever since the aftermath of the financial crisis in 2008. It convinced the organisation more investment was needed in resilience-oriented measures towards environmental, political, social and economic stresses. In 2014, this investment culminated in the *Guidelines for Resilience Systems Analysis*³², developed by OECD Development Assistance Committee members together with members from the OECD Experts Group on Risk and Resilience. The report aims to provide guidance on how to leverage local assets – rather than relying on external experts, how to complete a comprehensive assessment of the risks and resilience abilities present in a society, as well as how to translate them into resilience-oriented policies, strategies and programmes. The guidance is divided into five steps:

1. Governance and scope – The process' scopes are defined and relevant stakeholders are included in the process.
2. Pre-analysis and briefing pack – The types of

risk and their probability of occurrence are identified, as well as the vulnerabilities within the system.

3. Workshop on resilience – a two-day participatory process involving diverse actors from the city, in order to define concepts, set a vision and design a roadmap.
4. Roadmap for resilience – The roadmap illustrates the policy and programming changes needed to foster resilience. Changes are grouped as short-term and medium-term objectives, and actions undertaken at a later stage.
5. Measuring resilience – The analysis is concluded by defining five weighting indicators, namely system resilience indicators, negative resilience indicators, process indicators, output indicators and proxy impact indicators, in order to monitor and measure the system's resilience in a particular context.

Furthermore, as of 2015, OECD launched the *Resilient Cities* research project, aiming to better understand cities' ability to absorb, adapt, transform and prepare for future shocks (economic, environmental, social and institutional), and to promote sustainable development, well-being and inclusive growth. The project, which is part of the OECD contribution to the Third UN World Conference on Disaster Risk Reduction, the UN Sustainable Development Summit and Habitat III, works on 10 case studies – Antalya, Belo Horizonte, Bursa, Cardiff, Kobe, Kyoto, Lisbon, Oslo, Ottawa and Tampere – and focuses mainly on economy, governance, society and environment. A preliminary report was released in June 2016.

OECD also collaborates with other international organisations for the advancement of resilience.

DG-DEVCO, for instance, follows discussions on aid effectiveness by OECD's Development Assistance Committee. Likewise, the organisation has worked together with the Global Facility for Disaster Reduction and Recovery and the World Bank Group to publish a report on *Climate and Disaster Resilience Financing for Small Island Developing States*.



Understanding of Resilience: OECD defines resilience as *the ability of households, communities and nations to absorb and recover from shocks, whilst*

positively adapting and transforming their structures and means for living in the face of long-term stresses, change and uncertainty. OECD clearly subscribes to a multi-hazard understanding of resilience and acknowledges different types of interconnected shocks or stresses. Accordingly, resilience thinking has been integrated in a wide array of development activities carried out by the organisation, from risk reduction to fragility and conflict, and from economic to social development.

Union for the Mediterranean



ID: The Union for the Mediterranean (UfM) is an intergovernmental organisation based in Barcelona and gathering 43 countries – 28 European Union Member States and 15 countries from North-Africa, the Middle East and the Balkans – with the scope of enhancing regional cooperation and dialogue in the Euro-Mediterranean arena. The UfM provides a platform to formulate regional priorities and decide on specific cooperation initiatives to be put in place. In this light, the Secretariat is responsible for liaising among its member states, ensuring the follow-up of the identified regional priorities and promoting – in coordination with international actors – region-wide cooperation projects and initiatives for sustainable development in the Mediterranean³³.



Commitment to Resilience: The UfM Secretariat's commitment to urban resilience unfolds through the framework of its Urban Projects Finance Initiative (UPFI) – launched in 2014 – as well as through a recently established collaboration with the United Nations Human Settlements Programme (2016), which will deliver technical support in the definition of how the analysis of the impact of the UPFI investment should be done. The Finance Initiative is the financial component of the 'Euro-Mediterranean Sustainable Urban Development Strategy', which is tasked to establish a shared common framework for the development of sustainable urban and territorial strategies. Co-managed by the Agence Française de Développement and the European Investment Bank – with the support of the European Commission – its purpose is to select, endorse and finance sound urban development projects in the Mediterranean region, as

well as to foster the development of private, public or inter-regional projects³⁴.

The UfM Secretariat's work on sustainable urban development will be supported by UN-Habitat with Technical Assistance and Analysis, particularly with regards to water management, risk reduction and resilience. The Memorandum of Understanding defining the agreement was signed in April 2016 by UN-Habitat's Executive Director, Joan Clos, and the UfM Deputy Secretary General for Transport and Urban Development Ambassador, Yigit Alpogan. The UfM will work in close collaboration with the UN-Habitat City Resilience Profiling Programme (CRPP) – also based in Barcelona – which will be responsible for assisting the Secretariat in the implementation of the New Urban Agenda.

Finally, the Secretariat of the UfM is also committed to building resilience through two of its six priority areas, namely Energy & Climate and Water & Environment. The former encompasses regional dialogue and efforts to prepare for energy vulnerabilities as well as current and future climate change stresses and extreme events. The Energy & Climate priority area gathers UfM members and relevant stakeholders in two bodies – the UfM Energy Platforms and the UfM Climate Change Expert Group – responsible for tackling regional issues. The Water & Environment priority area aims to mitigate environmental threats by primarily implementing high impact projects related to water management. The UfM's efforts in this area are framed within a larger strategy to foster sustainable development. One of these projects concerns the Horizon 2020 initiative, funded by the European Union, to depollute the Mediterranean with the objective of tackling 80% of pollution loading by 2020.



Understanding of Resilience: In the strength of its partnership with UN-Habitat, the UfM Secretariat’s understanding of urban resilience adheres to a multi-sectoral and multi-scalar approach. As explained by the UfM Deputy Secretary General Ambassador, Yigit Alpogan, “The Mediterranean region is in the middle of a strong spatial transformation linked to population growth, widespread urbanisation and deep changes in its political, social and economic model. This transformation is particularly felt in its cities, which

are also confronted with new environmental impacts. In response to these challenges, and with the aim of improving the liveability of Mediterranean urban areas, the UfM actively promotes sustainable urban development in the region following an integrated and cooperative approach, as well as regionally-applicable solutions, focusing on youth as a key driver for stability in the region.”³⁵ The Euro-Mediterranean Sustainable Urban Development Strategy – in collaboration with UN-Habitat – is proactively committed to pursuing this aim.



Venice threatened by sea level rise in the Mediterranean region, Italy.
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4.1.2 The Rockefeller Foundation and 100 Resilient Cities Network

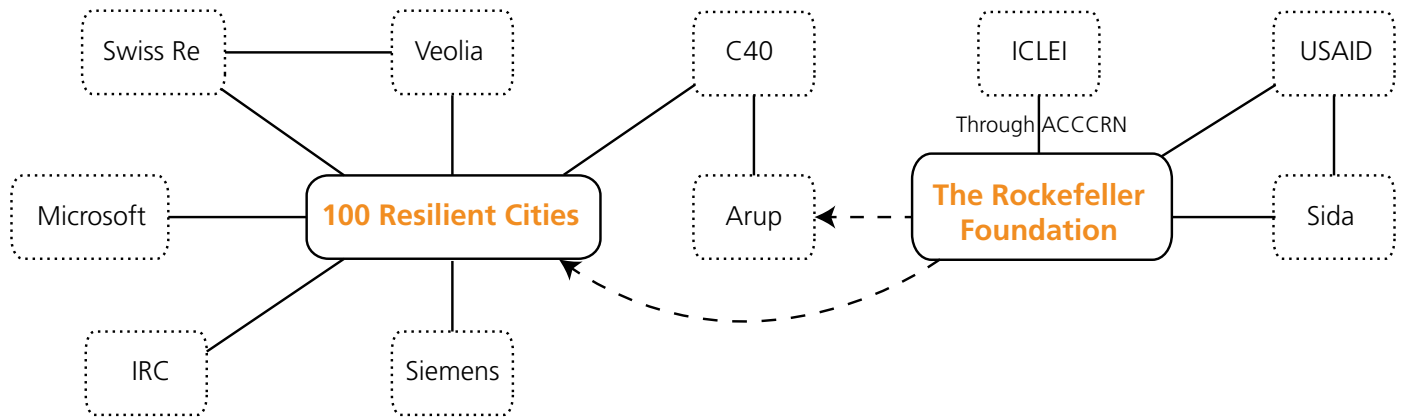


FIGURE 4.3: The Rockefeller Foundation and 100 Resilient Cities Network.

The Rockefeller Foundation



ID: Established as a private foundation in 1912 in New York, The Rockefeller Foundation is committed to “promoting the well-being of humanity throughout the world”, providing grants and funding across a wide array of sectors and fields – Health, Agriculture, Food Security, Arts and Culture, Resilience, Climate Change, Energy, Gender Equity, Inclusive Economy, Finance, Innovation, Sports, Water, Fisheries and Urban Development. In 2015, it was ranked the 39th largest US foundation by total giving, and its agenda currently adheres to the dual goals of building greater resilience and advancing more inclusive economies.



Commitment to Resilience: Since the late 2010s, The Rockefeller Foundation has been joining, funding and pioneering a diverse set of alliances and initiatives related to urban resilience, featuring as a major driver for resilience thinking on a global scale. The Rockefeller Foundation is also part of the Medellin Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellin, Colombia in 2014. The MCUR includes UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance.

Furthermore, the foundation is involved in various initiatives related to the field:

- *Rebuild by Design:* A multi-stage design contest co-launched by The Rockefeller Foundation and the United States Department of Housing and Urban Development, in order to enhance resilience in the regions affected by Hurricane Sandy. 148 interdisciplinary teams of engineers, architects, planners and social scientists took part in the competition, engaging with local communities and leaders, and putting forward an inclusive planning process for post-disaster scenarios. Eventually, 10 teams were selected and awarded with USD 920 million from the Housing and Urban Development department and USD 3 million from The Rockefeller Foundation³⁶.
- *Asian Cities Climate Change Resilience Network:* Pioneered by The Rockefeller Foundation, it includes practitioners and institutions involved in creating knowledge, accessing resources and influencing agendas to enhance inclusive urban climate change resilience³⁷. The initiative started with a first cohort of 10 Asian Cities in 2008, but quickly managed to gather a network of 50 urban centres, developing a climate change resilience plan by 2016. Many of these cities were successively included in the 100 Resilient Cities’ network.
- *Global Resilience Partnership:* In 2014, teaming up with the US Agency for International Development (USAID) and the Swedish International Development Cooperation Agency (Sida), The Rockefeller Foundation launched the Global Resilience Partnership, with the goal of profiling and implementing innovative local solutions for resilience in the

Horn of Africa, the Sahel, South and South-East Asia. A key component of the partnership is the Global Resilience Challenge (GRC): an international competition gathering 500 applicants, each proposing innovative solutions for the aforementioned aim. 8 winners were selected in 2015 and each of them was provided with USD 1 million to implement its project³⁸.

- *100 Resilient Cities*: Pioneered in 2013 by The Rockefeller Foundation – and supported by a broad network of global partners – 100 Resilient Cities (100RC) was launched with the goal of making cities learn from and plan for disruptions. A network of 100 cities was selected out of a thousand of applications over a period of three years. Through 100RC, The Rockefeller Foundation will help cities develop new resilience strategies and will support the hiring of a Chief Resilience Officer for each city of the programme.
- *Rebuilding New Orleans*: Within the framework of the Rebuilding New Orleans Initiative, The Rockefeller Foundation has contributed a USD 3 million aid package for recovery and relief after

Hurricane Katrina. Moreover, New Orleans has been working closely with 100 Resilient Cities, as a part of its network³⁹.

- *Zilient.org*: Early 2017, in partnership with Thomson Reuters Foundation, Blue State Digital and OnFrontiers, The Rockefeller Foundation started an online platform gathering professionals from the private, public and academic sectors to advance resilience. The platform allows the sharing of news, knowledge, and events as well facilitates collaboration amongst members.



Understanding of Resilience: The Rockefeller Foundation – as well as the initiatives, projects and non-governmental bodies it has been funding – adopts a broad understanding of urban resilience, defined as *the ability of individuals, communities and systems to withstand shocks and stresses – both natural and man-made – as well as to transform when conditions require it.*

100 Resilient Cities



ID: 100 Resilient Cities is a non-profit organisation – pioneered by The Rockefeller Foundation – established in 2013 and globally committed to assisting cities in the enhancement of urban resilience at the spatial, economic and societal level⁴⁰.



Commitment to Resilience: When 100 Resilient Cities (100RC) was launched in 2012, its programme goal was to gather a network of 100 cities – geographically balanced and from both developing and developed countries – which would have been supported in becoming more resilient. The first 32 cities were announced in December 2013, the second cohort of 35 cities was made public a year later, and in May 2016, the last selection was revealed. As of March 2017, 26 of these 100 cities have developed a city resilience strategy that outlines their process of building resilience.

The bulk of 100 Resilient Cities' efforts revolves around supporting a city in the development of a resilience strategy, as well as around the Chief Resilience Officers' role – an innovative position

within the city government, tasked to directly advise the mayor, or chief executive, on resilience-building, as well as to work across government departments to improve communication and coordination⁴¹. Within this framework, 100RC helps its partner cities with both technical and financial advice, while channelling funds to hire a Chief Resilience Officer, who will liaise between 100RC's broader strategy and its local declinations. Furthermore, through a strategic partnership, Arup provides 100RC with the City Resilience Index – a tool developed with financial support from The Rockefeller Foundation – and assists the Chief Resilience Officers with consulting activities (see Arup profile below). The Index provides local administrations with an accessible, evidence-based instrument to assess their resilience standards as well as to develop integrated urban planning, practice, and investment guidelines.

100RC relies upon a platform of more than 30 partners, carefully selected from the private, public, academic and non-profit sector. This network of partners – besides the initial USD 100+ million commitment of The Rockefeller Foundation – is thought to provide cities with expertise, data, resources and competencies.

Finally, being pioneered by The Rockefeller Foundation as part of its centennial commitment to resilience, 100RC is also part of the Medellin Collaboration on Urban Resilience (MCUR).



Understanding of Resilience: 100 Resilient Cities adopts a multi-disciplinary and holistic definition of resilience, meant as *the capacity of individuals, communities, institutions,*

businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience. Shocks are typically considered single event disasters, such as fires, earthquakes, and floods, while stresses are factors that pressure a city on a daily or continuative basis – such as chronic food and water shortages, an overtaxed transportation system, endemic violence or high unemployment.

Arup



ID: Arup (officially Arup Group Limited) is a private multinational company founded in 1946 and owned in trust for the benefit of its employees and dependants. With offices in 28 countries and more than 10,000 projects in five continents, its activities encompass a wide array of areas related to the built environment: from urban planning and design to project management and consulting⁴².



Commitment to Resilience: The multinational firm has been working on urban resilience as part of a broader strategic partnership with The Rockefeller Foundation and 100 Resilient Cities since 2013. Fully acknowledging the importance of forging more resilient cities from a wide range of perspectives, Arup's main contribution to urban resilience is the City Resilience Framework/City Resilience Index: a tool enabling cities to assess the factors that contribute, positively or negatively, to their resilience.

Realised over a period of 18 months through both desk-based research and fieldwork in six cities, the Index builds upon a framework of 4 dimensions of resilience – people, organisation, place and knowledge – as well as 12 resilience goals and 52 detailed indicators. Here following is a breakdown of its development process.

- *Desk-based research.* Consultation of 150 sources – mainly websites, academic articles and reports – in order to understand the main urban challenges to resilience. From the existing literature, 14 cities were selected from low, middle and high GDP per capita. Moreover, 384 factors were profiled, as those elements and assets whose presence or absence can positively or negatively contribute

to the city's resilience. Among the factors there are both proactive (prevention) and reactive (emergency) ones.

- *Fieldwork in six cities.* The cities of Concepcion, Cali, Cape Town, New Orleans, Semarang, Surat were selected among those wherein Arup has offices. This step aimed at profiling new possible factors, collect anecdotal evidence of the tools, understand how resilience is understood from the different stakeholders' perspective and pinpoint cases where stakeholder dynamics have limited, or contributed to, certain groups' resilience. Out of the six cities: 83 interviewees, 35 focus groups, 9 workshops, 1500 factors, 450 consultees were completed (108 from the government, 68 from businesses and 274 from civil society and the public sector)⁴³.

The City Resilience Index has been adopted by 100 Resilient Cities as an assessment and planning tool to be implemented in its cohort of partner cities. Moreover, building upon its decennial expertise in urban planning and consulting, Arup will work in close collaboration with the Chief Resilience Officers appointed by 100 Resilient Cities, in order to design tailored strategies, which will be instrumental to guide and support the practical implementation of resilience-building activities, to engage internal and external stakeholders, as well as to present cases for investment. Within this framework, Arup's role includes training and capacity-building of city officials, planning and facilitation of stakeholder engagement activities, technical and strategic advice on effective resilience actions to tackle each city's shocks and stresses, and project management through each stage of the strategy development process⁴⁴.

In addition, the company has more recently launched a Joint Programme on Resilience Engineering in partnership with the Lloyd's Register Foundation, with the scope of gathering proposals for “consolidating knowledge on resilience between and within critical infrastructure sectors”⁴⁵. By the end of February 2017, five to ten proposals had been selected by a panel of experts appointed by the company, in order to assess the relevance of the submitted projects in the critical infrastructure sector – water (and food), transportation, healthcare, communications and energy –including cross-sectorial interdependencies. A total funding of

GBP 150,000 will thus be delivered by Arup to the selected projects.



Understanding of Resilience: Drawing upon the insertion of urban resilience among the 17 Sustainable Development Goals, Arup – as well as its strategic partners – fully subscribes to a holistic and multi-sectoral definition of resilience, informed by a system-based understanding of cities and willing to consider interconnections between its functioning variables.

C40 Cities Climate Leadership Group



ID: Formed in 2005 by Ken Livingstone, former Mayor of London, the C40 Cities Climate Leadership Group (C40) is a collaborative network connecting now more than 80 cities across the world

with the intent of tackling climate change issues and driving urban actions to reduce greenhouse gas emissions and climate risks, thereby improving the health, wellbeing and economic opportunities of urban populations. C40 aims to assist cities identify, develop, and implement local policies and programs that have a collective global impact. The organisational structure of C40 allows mayor-members to serve in rotation on a Steering Committee, providing strategic direction and governance for C40. The current chair of the C40 group is Paris' Mayor Anne Hidalgo, while former Mayor of New York City, Michael Bloomberg, serves as President of the Board. The current Steering Committee consists of members from: Amman, Copenhagen, Hong Kong, Jakarta, Johannesburg, London, Los Angeles, Mexico City, Milan, Rio de Janeiro, Seoul and Tokyo⁴⁶.



Commitment to Resilience: C40's entry point into urban resilience is through a climate change adaptation and disaster risk management agenda. To improve how cities measure risks and improve resilience-building decisions against such risks, C40 promotes direct assistance, peer-to-peer knowledge exchange and research among member cities. Members convene annually in different locations, where alliances between leaders and various stakeholders are forged, helping to further develop and implement carbon reduction strategies. C40's efforts are focused under seven overarching initiative areas, namely:

1. Adaptation and Water
2. Energy
3. Finance and Economic Development
4. Measurement and Planning
5. Solid Waste Management
6. Urban Planning and Development, and
7. Transportation

C40 utilises data-driven approaches that address mitigation, adaptation and sustainability issues of highest priority to cities, convening projects in 17 associated networks that fall under the 7 areas. Particular focus is placed on cities that potentially have great climate risk impacts.

Furthermore, through its Measurement and Planning area, C40 has developed an online reporting system and planning tool – the *Climate Change Risk Assessment Framework and Tool (CRAFT)*⁴⁷ – as part of its commitment to help cities reduce climate risk. Comprising three reporting modules, the Tool provides a streamlined process for city officials to report on and evaluate what is happening in their city. The three reporting modules are as follows:

1. *Profile the City:* This module collects city data on general characteristics that influence city resilience and adaptation planning. This information can support shared learning and inform adaptation planning at the local level.
2. *Understand the Problem:* This module asks the city to report on their vulnerability assessment process, the climate risk and vulnerability faced now and in the future, and the underlying factors within a city that can enhance or challenge a city's ability to adapt.

3. *Plan, Respond and Monitor*: This module is focused on the climate adaptation planning process undertaken by cities and how cities evaluate the outcomes of their adaptation efforts. Reporting fields relate to adaptation planning, adaptation goals and actions, and adaptation barriers and opportunities.

Included in the Framework and Tool is a *City Climate Hazard Taxonomy*, co-developed with international firm Arup, which documents climate hazards threatening cities, local responses and how these hazards may change in the future. The Taxonomy – placing emphasis on the urban context – further aims to establish a common language that will enable cities facing similar hazards to share challenges and opportunities, as well as to provide a platform for collaborative problem solving⁴⁸.

Also, C40 is part of the Medellin Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellin, Colombia in 2014.

Finally, in November 2016, C40 announced a partnership with 100 Resilient Cities to leverage the resources and expertise of both organisations to ensure sound climate change and resilience plans. The partnership will benefit in the first place the joint member cities, and secondly cities more broadly, and includes the dissemination of tools and financing solutions, city-to-city exchange and support to cities in climate change mitigation, adaptation and resilience plans.



Understanding of Resilience:

Though not explicitly defined, C40's understanding of resilience is centred around the issues of climate change adaptation and mitigation. Within its network, the C40 cities prioritise climate change risks, as well as share best practices that build climate resilience. C40's network maintains the notion that creating resilient cities for citizens inherently makes these cities more attractive and resilient for businesses.

ICLEI - Local Governments for Sustainability



ID: ICLEI – Local Governments for Sustainability, is a global association of local, national and regional government organisations committed to achieving sustainable development. It was established in 1990 as the International Council for Local Environmental Initiatives when more than 200 local governments from 43 countries convened at the World Congress of Local Governments for a Sustainable Future in New York City. As a democratic organisation, every local government Member holds a position on the ICLEI Council. The Council now convenes every three years – at the ICLEI World Congress – where they establish a six-year Strategic Plan of priorities and operations. The most recent World Congress was held in April 2015 in Seoul, South Korea⁴⁹.



Commitment to Resilience: According to its mission, ICLEI aims “to build and serve a worldwide movement of local governments to achieve tangible improvements in global sustainability, with a special focus on environmental conditions through cumulative local actions.”⁵⁰ Through organisational activities – impacting over 20 percent of the world's urban population – ICLEI promotes local

action for global sustainability and supports cities to: a) become sustainable, resilient, resource-efficient, bio-diverse, and low-carbon, b) build smart infrastructures, and c) develop an inclusive, green urban economy. ICLEI has developed stable, long-term programmes to support local-level sustainability, and continues to develop innovative programmes that respond to issues of international concern.

The organisation's overarching programme for urban resilience, *Resilient Cities*, covers issues surrounding climate change mitigation and adaptation, disaster risk reduction, food security, policy making and financing. The programme produces a range of conferences, seminars, networks, tools and guidebooks that inform local leaders on how to build resilience at all government levels. Launched in 2010, the *Resilient Cities* congress is ICLEI's major annual conference on issues surrounding urban resilience and climate change adaptation – and a place where partnerships and dialogues among attendees are facilitated. From this perspective, *Resilient Cities* offers the platform for tracking local progress on the implementation of the resilience targets of SDG 11, which is further supported by the targets of the Sendai Framework for Disaster Risk Reduction⁵¹ (see chapter two).

In furthering its practical commitment, ICLEI's global network of 12 offices provides a broad range of services and tools that help cities build resilience, mostly through vulnerability and risk assessment, linking mitigation and adaptation, and building resilient infrastructure and financing. Furthermore, ICLEI connects with actors at the regional, national and international levels to further enhance resilience against urban risks, economic shocks and other unforeseen events. Notably, ICLEI has partnered with Asian Cities Climate Change Resilience Network (ACCCRN) to facilitate and accelerate local actions on urban resilience against climate change in various cities spanning Bangladesh, India, Indonesia, Thailand and Vietnam⁵². A result of the partnership was the ICLEI-ACCCRN Process Toolkit aimed at helping municipal governments in Asia assess their climate risks in the context of urbanisation, poverty and vulnerability and to formulate corresponding City Resilience Strategies. The overarching goal of the Toolkit is to build resilience to climate change across all urban systems and for all groups, particularly the poorest and most marginalised populations. The Toolkit also presented the Local Government Self-Assessment Tool (LGSAT) from the UNISDR Making Cities Resilient campaign as a reference tool⁵³.

Finally, ICLEI is also part of the Medellin Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellin, Colombia in 2014. The MCUR includes UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance.



Understanding of Resilience: ICLEI's understanding of resilience bases itself in the social-ecological conceptualisation. It defines resilience as *the capacity of a social or ecological system and its component parts to cope with hazardous shocks and stresses in a timely and efficient manner by responding, adapting, and transforming in ways that restore, maintain, and even improve its essential functions, structures, and identity while retaining the capacity for growth and change.*



Community escalators in Medellin, Colombia.
© UN-Habitat / Julius Mwelu

International Rescue Committee



ID: The International Rescue Committee (IRC) is an American non-profit organisation founded in 1933 and committed to help – with both first-aid support and long-term assistance for recovering – people whose lives and livelihoods are endangered by conflicts or disasters. Working across different sectors – economic wellbeing, education, health, power, safety – the Committee’s activities span five continents, and range from humanitarian assistance in areas of crisis, to refugees’ re-settlement in 29 American cities⁵⁴.



Commitment to Resilience: The International Rescue Committee joined 100 Resilient Cities’ platform of partners in May 2016. Within this framework, the American NGO has been supporting 100RC’s action in those partner cities – mainly in Europe and the Middle East – wherein an unprecedented in-flow of migrants more and more present a social stress⁵⁵. The Committee will share its know-how on humanitarian assistance and resettlement, with the aim of forging more resilient urban communities.

Additionally, the International Rescue Committee has been working closely with Syrian refugees in Jordan since 2015, to strengthen the resilience of displaced households in the Jordanian governorates of Mafraq, Irbid and Ramtha. The project – which relies upon

USD 3.7 million in funding administered by the European Union, the United States government and the United Kingdom Department for International Development (DFID) – provides cash assistance to refugee households, as well as case management, health services, psychosocial support and outreach. Evaluation was carried out through the implementation of Coping Strategies Index – a tool measuring how households manage shortfalls in food consumption – and the total number of beneficiaries is expected to amount to 17,000 individuals, 93% of which Syrian and 7% Jordanian⁵⁶.



Understanding of Resilience: Part of 100RC’s network of partners, the International Rescue Committee’s understanding of resilience is well-aligned with the non-profit organisation pioneered by The Rockefeller Foundation, while selecting Economic Wellbeing, Education, Health, Power and Safety as its core goals, the Committee’s agenda – *IRC2020*⁵⁷ – frames its future action across six strategic objectives:

- Improve effectiveness
- Increase speed and timelessness
- Make the best use of resources
- Be more responsive to the people served
- Invest in research and development
- Expand in scale and reach

Microsoft



ID: Microsoft Corporation, commonly referred to as Microsoft, is an American multinational technology firm with a longstanding leading role in the field of digital innovation. As of October 2013, *Microsoft CityNext* was announced by the company as a global initiative aiming to develop ‘smart cities’ around the world⁵⁸.



Commitment to Resilience: In February 2015, *Microsoft CityNext* joined 100 Resilient Cities’ platform of partners, starting to share its expertise on cyber-

security and working closely with 100RC to make urban centres more cyber-resilient⁵⁹. While investments in the Cyber sector increase by 27% annually, the rate of investment for cyber-security is almost seven times lower. This makes cyber resilience a priority, in order to minimise huge economic losses in case of disaster or attack. In this regard, Microsoft first started working with Rotterdam’s Mayor’s office within the 100RC’s framework, developing a cyber-resilience plan for the city and port, which will be completed in a five-year term⁶⁰.

Aligning with 100 Resilient Cities’ agenda, the company has developed a five-step approach to help

cities design and implement cybersecurity strategies.

- A risk-based approach that looks at the overall structure of a city's systems to determine how to mitigate vulnerabilities to reduce the likelihood of system failure.
- The establishment of clear priorities and security baselines, using standards like NIST's "Framework for Improving Critical Infrastructure Cybersecurity," and the Council on Cybersecurity's "Critical Security Controls for Effective Cyber Defence."
- Working hand-in-hand with the private sector and other government entities to identify vulnerabilities.
- Educating citizens by equipping them with tools and resources to understand these issues.
- Formalising the creation of public-private partnerships⁶¹.

Furthermore, in 2016, Microsoft joined a public-private collaboration to empower a data-driven approach to building climate resilience, called the Partnership for Resilience and Preparedness (PREP). The partnership aims to help planners, investors and resource managers to incorporate climate risks into their decision-making process by promoting collaboration among information producers and users, enhancing accessibility of relevant data and facilitating knowledge sharing.



Understanding of Resilience: *Microsoft CityNext's* understanding of urban resilience aligns with 100 Resilient Cities' agenda, within whose framework it considers cybersecurity as an integral path of a city towards a resilient future.

Siemens



ID: Founded in 1847, Siemens AG is a privately held engineering company headquartered in Munich and Berlin, and with many other offices located around the world, focusing on the areas of electrification, automation and digitalisation. There are currently 10 divisions, under which the primary activities of Siemens are developed; namely, Power and Gas, Wind Power & Renewables, Power Generation Service, Energy Management, Building Technologies, Mobility, Digital Factory, Process Industries and Drives, Healthineers – formerly Healthcare – and Financial Services.



Commitment of Resilience: Previously, the bulk of the company's commitment to resilience was part of its *Infrastructure & Cities* division – established in October 2011 – which served as one of Siemens' major business areas at the time. Within *Infrastructure & Cities*, resilience activities were implemented through an array of subdivisions – rail systems, mobility and logistics, smart grid, building technologies, and low and medium voltage. In September 2014, this division was dissolved, thereby making way for its subdivisions to rise as main areas of focus for the company.

Although Siemens' commitment to urban resilience maintains a certain degree of autonomy from

international organisations, over the past years the company has become involved with Arup's and 100 Resilient Cities' work. During the active period of *Infrastructure & Cities*, Siemens collaborated with Arup and New York City's Regional Plan Association to develop the *Toolkit for Resilient Cities*. The framework is based on the premise that energy, transportation, water and building systems within a city are interlinked and that the technologies supporting these sectors share common attributes that are largely underpinned by IT and communication services. The Toolkit – aimed at decision makers in cities – explores the role of technology in enhancing the resilience of infrastructure systems. The Toolkit was developed using the case study of the electrical grid of New York City, following the aftermath of Hurricane Sandy that struck in 2012. The study investigated the impacts of droughts, heat waves, winds and floods on the generation, transmission and distribution of electricity, in order to extrapolate how New York City could ensure an uninterrupted electricity supply during extreme events.

Moreover, as of July 2016, Siemens entered the Platform Partners of 100 Resilient Cities, providing in-depth knowledge and expertise in the energy, transport and building sectors, as well as assistance to 100RC's cohort of cities in the design and implementation of their resilience strategies⁶².

Finally, Siemens proposes 5 different characteristics in which cities and infrastructure system managers can measure the resilience of their systems: robustness, redundancy, diversity and flexibility, responsiveness, and coordination. To assess resilience the company has developed a set of *Resilience Performance Indicators* for each of these 5 characteristics. Quantitative in nature, the indicators mostly require the input of percentages, time and cost.



Understanding of Resilience: Siemens defines resilience as *the ability of people, organisations or systems to prepare for, respond to and recover from hazards*. However, while adopting a whole system approach, Siemens remains more circumscribed to the infrastructural domain.

Swedish International Development and Cooperation Agency



ID: As a public body working on behalf of the Swedish parliament and government, the Swedish International Development Cooperation Agency (Sida) is responsible for the implementation of Sweden's Policy for Global Development, with the broader mandate of reducing poverty in the world and delivering humanitarian aid to people in need. The organisation's patterns of intervention are inscribed in Sweden's Aid Policy Framework⁶⁴, designed by the Swedish government, to which Sida annually reports its costs, revenues and results⁶⁵.

Sida's development strategies unfold across 33 countries, with projects spanning democracy and human rights, gender equality, environment, health, market development, agriculture and food security, education, sustainable societal development, conflict and peace security, and humanitarian aid⁶⁵.



Commitment to resilience: Building upon its longstanding experience of delivering humanitarian aid and implementing development strategies, the Swedish International Development Cooperation Agency also shows serious commitment to resilience-building across sectors.

In 2012, Sida published a report titled 'Resilience, Risk and Vulnerability at Sida', aiming to outline the organisation's commitment to the subject within the Post-2015 Development Framework. The review profiled six entry points for Sida to feed into global resilience-building efforts⁶⁶.

1. Make food security a cross-cutting concern that links global policy commitments to the challenges facing vulnerable people dealing with natural resource scarcity and natural hazards.

2. Adopt a more explicit risk and resilience emphasis in theories of change and in results frameworks.
3. Transcend rhetorical assumptions about "win-win" processes through better design, monitoring and evaluation.
4. Overcome categorisations of topics such as Disaster Risk Reduction and Links between Relief Rehabilitation and Development as "humanitarian" issues: while promoting frameworks which recognise that vulnerable people search for resilience strategies irrespective of whether the crises they face are eliciting humanitarian or developmental responses.
5. Use social protection as a cross-cutting concept to put resilience centre stage.
6. Link global/regional resilience-related policy and capacity efforts to national programming.

Moreover, together with USAID and The Rockefeller Foundation, Sida is one of the Global Resilience Partnership's funding actors, collectively deploying USD 150 million to increase the resilience of cities, communities and households across South and Southeast Asia, the Horn of Africa and the Sahel region⁶⁷. The partnership's commitment encompasses various realms, from food and water security to community resilience and from disaster risk reduction to climate change. It is active at the global, regional and national scale and engages with private, public and non-profit partners. A key component of the partnership is the *Global Resilience Challenge*: an international competition gathering 500 applicants, each proposing innovative solutions. In 2015, 8 winners were selected, who were each provided with USD 1 million to implement their projects⁶⁸. Within the framework of the Global Resilience Partnership, Sida has also been working with 100 Resilient Cities – pioneered by The Rockefeller Foundation – across five continents.



Understanding of resilience: Sida adopts a cross-sectoral understanding of the concept with a special focus on climate change adaptation and natural hazards prevention, accompanied by a great emphasis on human and societal resilience. Hence, resilience is defined as *the ability of countries,*

communities and households to manage change, by maintaining or transforming livelihoods and poor people's quality of life in the face of shocks or stresses – such as earthquakes and drought – without compromising their long-term prospects.

Swiss Re



ID: Swiss Re Group – commonly referred as Swiss Re – is a private company providing reinsurance, insurance and other services related to risk transfer. Its client base includes insurance companies, mid-to-large sized corporations and public entities. Its areas of activity encompass a wide array of fields, some of which are closely related to the built environment and urban resilience⁶⁹.



Commitment to Resilience: With the bulk of its activities related to risk transfer, Swiss Re's commitment to resilience mainly revolves around insurance, reinsurance and disaster risk calculation. In parallel, the company is permanently engaged in research and discussion facilitation on risk analysis, vulnerability and resilience-related fields. Within this framework, Swiss Re has been partnering with 100 Resilient Cities since 2013.

Swiss Re is one of the first companies coordinating with countries and local communities to enhance city resilience through innovative insurance solutions and private-public partnership. The company started working on resilience in 2013, when New York City's mayor, Michael Bloomberg, decided to launch the *Special Initiative for Rebuilding and Resiliency* – after Hurricane Sandy – tasking Swiss Re to provide a quantitative study of the natural and climate-related disasters threatening the city, as well as measures for risk reduction⁷⁰. Over the same period, Swiss Re Foundation – a non-profit organisation launched by the company in 2012 – deployed EUR 1 million, teaming up with the Global Earthquake Model Foundation, in order to produce continent-wide earthquake models and hazard maps in Latin America, mainly focusing on Lima and Quito⁷¹. In 2013, Swiss Re also published *Mind the Risk: a global ranking of cities under threat*

from natural disasters, a study on the loss of potential of the largest 616 metropolitan areas in the world, with respect to five types of natural disasters, calculating the potential human and economic toll⁷². On the long term, Swiss Re is also committed to supporting 100 Resilient Cities since 2013, offering 100RC member cities its CatNet® system: a browser based service – developed between 2003 and 2016 – which provides the company's clients with tailored-made maps of natural hazard information and mapping system. The service is also at the base of every risk scenario produced by the company.

Finally, during the World Economic Forum in Davos in January 2016, Swiss Re and Veolia (both partners of 100RC) partnered up to tackle critical issues in the areas of disaster risk reduction, climate change adaptation, infrastructure enhancement and recovery (see Veolia's profile)⁷³.



Understanding of Resilience: As evidenced in various articles and reports by Swiss Re, the bulk of the company's activities in the field of urban resilience is mainly focused on the relationship between a city's exposure to natural or man-made catastrophes and the economic impact they can have on its human and economic capital. In the previously mentioned *Mind the Risk* report, urban vulnerability is for instance calculated through exposure to five kinds of rare catastrophes and the economic damages they may generate. The five categories are earthquake, storm, storm surge, tsunami and river flood. From this perspective, Swiss Re – like other insurance companies – is primarily focused on economic loss and recovery, namely measuring urban resilience with *the capacity of a city to restore its economic functions in the shortest possible time after a disturbance.*

USAID



ID: The United States Agency for International Development or USAID⁷⁴ is a government-led agency created by President J.F. Kennedy in 1961 to unite several existing foreign economic development organisations and programmes. Today, the agency is active across various fields within the international development sector: from fighting extreme poverty to improving gender equality, and from expanding access to education to helping societies in their recovery from shocks and stresses.



Commitment to Resilience: Resilience emerged as a USAID priority late 2011 and has been on its agenda ever since. In 2012, the agency presented its first policy and programme guidance to build resilience to recurrent crises in highly vulnerable areas with low capacity. The policy is based on the notion that recurrent crises result from the combination of chronic vulnerability and exposure to contingent hazards, and has been implemented primarily in the Horn of Africa and Sahel regions as well as in Asian communities.

Over time, USAID institutionalised its commitment to resilience by establishing a senior-level Resilience Leadership Council and a Center for Resilience – incorporated in USAID’s Bureau for Food Security – which are to further support and coordinate the agency’s resilience efforts. To assess the impact of its resilience investments, the agency relies on multiple indicators, evaluating a reduction in humanitarian assistance needs, depth of poverty, moderate to severe hunger, and Global Acute Malnutrition levels⁷⁵.

Furthermore, the organisation has been particularly active in fostering women empowerment and gender equality, as well as good governance and democratic accountability, as a way of forging more resilient, inclusive and transparent systems. An interesting example in this regard concerns the Resilience in the Sahel Enhanced initiative. Launched in 2014 with an initial budget of USD 130 million for the first two years, the five-year programme joins humanitarian and development programmes to strengthen institutions and governance, increase economic wellbeing, and improve health and nutrition in the Sahel in order to address its recurrent challenges of chronic poverty, food insecurity, drought, state fragility, and violent extremism. The initiative started working in targeted

zones in the countries of Niger and Burkina Faso, and aims to help 1.9 million beneficiaries in areas ranging from vulnerability to sustainability, reducing their need for future humanitarian assistance.

USAID’s broader resilience policy also demonstrates the organisation’s determination to coordinate and foster collaboration among development and humanitarian partners, as well as support regional and country-led plans geared to enhance resilience and facilitate early actions after crises. USAID is not only oriented towards implementing projects, but also engages with other organisations and agencies to establish durable partnerships for collective, long-term resilience building as well as provide a network for funding. For instance, a collaboration between USAID, The Rockefeller Foundation and the Swedish International Development Cooperation Agency led, in 2015, to the creation of the Global Resilience Partnership. With an initial investment of USD 150 million from USAID, the partnership entails a three-stage grant competition calling for multi-sectoral teams to collaborate on innovative solutions to the toughest resilience challenges in the following regions: the Sahel, the Horn of Africa, and South and Southeast Asia. The global partners aim at improving resilience at multiple scales: from families to communities, from countries to regions, through locally driven, high-impact, scalable solutions.

Other partnerships in which the agency is involved, include the Global Alliance for Action for Drought Resilience and Growth, which joins relief and development actors and resources to support effective country-led plans, and the Global Alliance for Resilience – Sahel and West Africa, a framework that encourages resilience initiatives in 17 West-African and Sahelian countries.



Understanding of Resilience: USAID defines resilience as *the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth*. This approach focuses on resilience to both natural and human-made hazards, in regions where chronic poverty critically intersects with exposure to various shocks and stresses.

Veolia



ID: Headquartered in Paris and established in 48 countries, Veolia Environnement S.A., branded as Veolia, is a transnational firm providing services to cities, regions and local communities in the sector of water management, waste management and resources. Since the early 2000s, the company's activities are also sided by a research institute, the Veolia Institute (2001), and a non-profit body, the Veolia Foundation (2004). The former is tasked to contribute to the debate on climate change and urbanisation, as well as on other environment-related economic, sociological and cultural themes, whereas the latter was established to fund community-oriented projects of environmental preservation, both in France and abroad. So far, over 1,350 projects have been funded⁷⁶.



Commitment to Resilience: Veolia's commitment to resilience was embodied by its partnership with 100 Resilient Cities in October 2014, within whose framework the French company started providing cities with guidance, best practices and a roadmap on its fields of expertise. These areas include water, wastewater, rainwater, energy, street lighting and solid waste management operations and infrastructure solutions that identify areas to realise the largest potential for resilience dividends.

Furthermore, as of January 2016, in the margins of the World Economic Forum in Davos, The Rockefeller Foundation brokered a crucial partnership between Veolia and the re-insurance company Swiss Re (both partners of 100RC), tasked to tackle critical issues in the areas of disaster risk reduction, climate change adaptation, infrastructure enhancement and recovery⁷⁷. Veolia and Swiss Re will work to develop a pilot initiative in New Orleans – part of 100RC's network – which would provide a blueprint for similar operations in other urban centres. While Swiss Re's longstanding knowledge in risk-evaluation will be of critical importance to assess the city's future exposure to natural disaster and climate change, Veolia will deploy its expertise to design a strategic action plan for both mitigating the impact of possible shocks and effectively responding to them. Moreover, according to the plan designed by Veolia, Swiss Re will provide pre-agreed emergency and recovery funding via risk financing instruments⁷⁸.



Understanding of Resilience: As a strategic partner of 100 Resilient Cities and The Rockefeller Foundation, Veolia's approach to urban resilience is well aligned with the City Resilience Index developed by Arup, according to which Economy & Society, Infrastructure & Environment, Leadership & Strategy, and Health & Wellbeing⁷⁹ constitute the four main areas to work on to forge more resilient cities.



4.1.3 United Kingdom Department for International Development Network

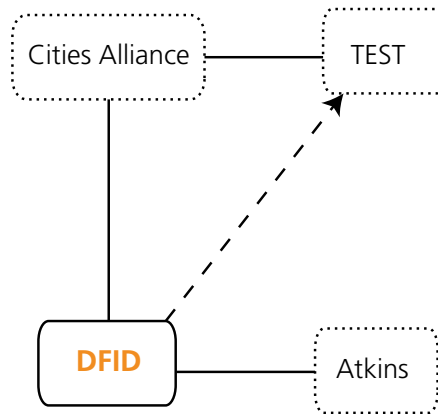


FIGURE 4.4: United Kingdom Department for International Development Network.

United Kingdom Department for International Development



ID: Established in 1997, the UK government’s Department for International Development (DFID) is responsible for the British government’s international development policies, with priorities spanning global peace, security and governance, resilience and response to crisis, promotion of global prosperity, extreme poverty reduction and, more generally, support to the world most vulnerable communities.



Commitment to Resilience: The bulk of DFID’s commitment to resilience revolves around the *Future Proofing Cities* project. Adopting an innovative approach to cities, the project team was tasked to identify environmental risks solutions, cities’ potential for both reducing vulnerabilities and delivering development benefits, and the capacity required for implementation. Launched in 2012, in collaboration with Atkins and University College London’s Development Planning Unit, the initiative also benefits from the support of The Rockefeller Foundation and the World Bank.

Future Proofing Cities builds upon the assumption that world cities should begin future proofing to protect themselves from a growing set of challenges – from rapid urbanisation to climate change – that threaten their stability. From this perspective, the project analysed 129 African and Asian urban areas, spanning 20 developing countries, and delivered 102 policy guidelines to improve resilience across various sectors. Moreover, the outcome of this research will inform

the actions that the UK Department for International Development is carrying out across regions, in the field of resilience.

The innovative approach advocated by *Future Proofing Cities* has also informed other resilience-related initiatives launched by DFID in coordination with other partners. In partnership with The Rockefeller Foundation, the Asian Development Bank, USAID and the Swiss Secretariat for Economic Affairs – the UK Department for International Development has been proactively committing to create an Urban Climate Change Resilience Trust Fund, in order to mobilise the financial resources required for building resilience to the effects of climate change and to reduce vulnerability of the urban poor in 25 medium-sized Asian cities⁸⁰. Active since 2013, the Urban Climate Change Resilience Trust Fund has been delivering financial support to cities across Pakistan, Bangladesh, India, Indonesia, Myanmar, Philippines and Vietnam⁸¹.

Finally, DFID also provides funding to The Ecological Sequestration Trust for the development of the *resilience.io* diagnostic tool (see the related profile below). The latter, which will provide quantitative and systemic analyses of city-regions’ resource flows – across the economic, environmental and societal realm – in their connection to broader national and global systems, will be tested in Accra, Ghana as part of the Future Cities Africa programme run by Cities Alliance (see Cities Alliance’s profile).



Understanding of Resilience: Adopting resilience as a core approach to tackling disasters – from risk reduction to climate change adaptation and from social protection to humanitarian preparedness – the UK Department For International Development defines resilience as *the ability of countries, communities and households to manage change, by*

maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, drought or violent conflict – without compromising their long-term prospects. Although DFID focuses more on resilience to disasters, its work has been led by its Policy Division, to ensure the inclusion of these actions in broader, long-term strategies that encompass various strands of the agency’s work.

Atkins



ID: Founded in 1938, Atkins is a large global design firm with a longstanding and proven experience in built environment and cities. It works with municipal authorities, national and regional governments, development agencies and private stakeholders on a wide array of disciplines – water, energy, construction, planning, climate change, architecture and economics amongst others – providing cities, and those willing to invest in them, with consulting and technical support⁸².



Commitment to Resilience: While Atkins bilaterally partners with local and national governments, banks or development agencies for risk assessment and consulting, the company’s main commitment to resilience-building is tightly connected to the *Future Proofing Cities* project. As of 2012, Atkins started leveraging its longstanding experience in urban issues towards contributing to the global momentum on resilience. In partnership with the UK Department for International Development (DFID) and University College London’s Development Planning Unit, and benefitting from the support of The Rockefeller Foundation and the World Bank, it started the *Future Proofing Cities* project.

The *Future Proofing Cities* tool – result of a 9-month joint research – is a risk analysis-oriented inquiry, seeking to enhance the understanding of environmental threats faced by developing countries, and provide DFID with the adequate equipment and approaches to drive its future actions⁸³. Based on the assumption that world cities should start future proofing themselves as to turn risks and challenges into economic and environmental opportunities, the report analyses 129 African and Asian urban centres from 20 developing countries, sided by 12 benchmark cities from middle-to-high-income ones. The data provides the ability to undertake a comparative analysis across different

regions and geographies, making use of geospatial risk data from CIESIN – Centre for International Earth Science Information Network at the Earth Institute (Columbia University) – as well as more typical data point from international organisations such as the UN and the World Bank. Additionally, data is included in a projected GDP per capita and population growth up to 2025.

In the *Future Proofing Cities* tool, cities are analysed from a global, regional and local perspective, and grouped into five ‘urban types’ according to the environmental threats they are exposed to, based on a) carbon emissions and energy use, b) resource and ecosystems risks, and c) how climate risks intersect with one another in a given urban environment.

The five ‘urban types’ are:

1. Energy-intensive, sprawled cities with significant carbon footprints;
2. Cities with major climate hazards;
3. Cities with regional support system(s) at risk (water, food, biodiversity);
4. Cities with multiple risks: energy, carbon, climate hazards, and regional support systems;
5. Cities with a low current risk profile.

These only refer to the main threat facing the urban area and do not exclude other secondary hazards. Moreover, they only provide a static snapshot of cities, which essentially needs to be tracked over time. After grouping cities into five types, the report looks more closely at cities’ vulnerability – defined as the contextual combination of geographic, economic, societal, infrastructural, institutional and resource variables – and ability to withstand risks. The latter depends on the strength of its economy and governance, on the efficiency of its planning and on its capacity to provide win-win finance situation for stakeholders. Eventually, concluding this diagnostic phase, the report provides 102 policy guidelines for improving resilience across multiple sectors (transport,

buildings, energy, industry, water, waste, flood and storm surge defences, disaster preparedness, food, natural habitat and green spaces, informal settlements). The integration of the hazard assessment framework within these policy guidelines is expected to create win-win and triple-win situations for cities in turning their risks and challenges into opportunities.

The *Future Proofing Cities* methodology has now been applied to other risk assessments and policy evaluations carried out by Atkins in various geographical contexts, as well as through different

bilateral partnerships with a wide array of private and public actors.



Understanding of Resilience: Atkins' understanding of resilience is inherently tied to the concept of 'future proofing', namely *the ability to utilise and develop the capabilities of cities for responding to environmental risks, e.g. climate hazards, resource scarcities and damages to ecosystems, in a way that catalyses social and economic prosperity.*

Cities Alliance



ID: The Cities Alliance features as a partnership of bilateral and multilateral development agencies, non-governmental organisations, governments, local authorities, foundations, private sector companies and knowledge institutions, created to promote innovative, accountable, long-term and integrated work programmes for reducing poverty and fostering sustainable development in cities. The partnership works along four main lines: a Catalytic Fund – through which grants of up to USD 200,000 are provided for sustainable urban development projects – Communication and Advocacy, Knowledge Programmes and Country Projects.



Commitment to Resilience: Although, since its establishment in 1999, Cities Alliance's mandate has been directed mainly at improving living conditions in informal areas – see the Cities Without Slums Action Plan, then assimilated into the UN Millennium Development Goals as target 11 (2000) – the partnership's mission has been considerably diversified over the last two decades. The most recent initiatives undertaken include a wide array of policy-design programmes with regards to gender equality, migration, economic growth and urban resilience among others.

One of the major efforts undertaken by the Cities Alliance in terms of urban resilience was the creation of a Joint Work Programme on Resilient Cities, launched at the 2015 Paris Climate Change Conference. Currently chaired by ICLEI – Local Governments for Sustainability, the Joint Work Programme on Resilient Cities brings together several Cities Alliance members, including the

C40 Cities Climate Leadership Group, the French Alliance for Cities and Territorial Development, the German Agency for International Cooperation, Global Facility for Disaster Reduction and Recovery (GFDRR), the International Institute for Environment and Development, the Inter-American Development Bank, 100 Resilient Cities – pioneered by The Rockefeller Foundation, Slum Dwellers International, The Ecological Sequestration Trust, UNEP, UN-Habitat, UNISDR, Women in Informal Employment: Globalizing and Organizing, the World Bank and the World Resources Institute. It also partners with the C40 Climate Leadership Group, the Medellin Collaboration on Urban Resilience (MCUR), 100 Resilient Cities, and the Global Initiative for Resource Efficient Cities.

The Programme is strongly aligned with the Post-2015 Development Framework, the Paris Agreement and the New Urban Agenda, promoting integrated strategies to enhance the resilience of cities to both climate change or natural disasters and the socio-economic stresses produced by rapid urbanisation. From this perspective, the Joint Work Programme is proactively committed to aligning the aforementioned challenges with the members of the partnership, in order to leverage the diversity of knowledge and expertise, fostering city-wide development plans, resilience practices and assessment methods⁸⁴.

In addition, Cities Alliance has also been working with the UK Department for International Development (DFID) on the *Future Cities Africa* initiative. The project, which is tasked to provide cities in Ghana, Ethiopia, Uganda and Mozambique with tools to 'future proof' themselves – to climatic changes, environmental challenges and resource scarcity – unfolds as a part of the *Future Proofing Cities* initiative, launched by DFID in 2012, in collaboration

with Atkins and University College London's Development Planning Unit. To this extent, Cities Alliance is also contributing to develop the *resilience.io* tool – launched by The Ecological Sequestration Trust (see profile for further information) – which will be firstly tested in Accra, Ghana, in the Future Cities Africa initiative.

Finally, in 2015 Cities Alliance funded the launch of the *resiliencetools.org* platform which aims to help local governments and other officials understand the utility of the different resilience tools and diagnostics available to them. The platform analyses for instance whether tools and diagnostics can be self-deployed, concern rapid assessments, or are more action-oriented and require sophisticated institutional, technical and financial capacities for implementation. The idea for

the platform was originally conceived by the Medellin Collaboration on Urban Resilience (MCUR) and was implemented by Cities Alliance upon the Alliance's entry into the Collaboration.



Understanding of Resilience: In the strength of its diversified spectrum of activities, and benefitting from the wide range of partnerships within which it is involved, the Cities Alliance adopts a highly cross-sectoral and integrated understanding of resilience, which – while building upon a strong social emphasis on the community scale – encompasses the interconnections between climate-related challenges, natural hazards and rapid growth.

The Ecological Sequestration Trust



ID: Established in 2011 as a UK-registered charity, The Ecological Sequestration Trust (TEST) is a non-profit organisation committed to improving energy, water and food security in cities, amid the challenges produced by climate change, demographic transformations and resource scarcity. Within these scopes, and taking a design-led approach to the city-region scale, The Ecological Sequestration Trust aims to foster new open-source forms of collaboration between public and private actors, in order to positively impact the social, spatial and economic relationship featuring between the city and its broader metropolitan area.



Commitment to Resilience: Against this background, The Ecological Sequestration Trust's practical commitment to resilience-building is well expressed by its tool: *resilience.io*.

Launched in 2014 and still under development, the tool benefits from the support of eight diverse partners⁸⁵ and is tasked to facilitate regional decision-making, planning, governance, procurement and investment processes.

In this light, *resilience.io* is thought as an open source and web-based platform to provide quantitative and systemic analyses of city regions' resource flows – across the economic, environmental and societal realm – in their connection to the broader national and global systems. The tool, which will identify the

minimum requirement for quantity and quality of data for operating the platform successfully, has five core building blocks:

- *Land use and function:* Geospatial representation of the city-region used to characterise the spatially dependent properties of the system, namely land use, building types, soil quality, water bodies and topographic characteristics in general.
- *Agent activities:* The combination of human systems of people and businesses located spatially, to simulate decisions that process resource inputs into outputs.
- *Resource flows:* Building upon the agent activities and land use, this model calculates the flows of renewable and non-renewable natural resources, stocks and flows across the region, wastes, and energy flows.
- *Service and infrastructure networks:* This provides local infrastructure owners with a common platform to conceive their networks as a part of a broader integrated regional system, as well as to design changes in this broader picture and coordination with land-use development planning.
- *Technologies/Infrastructure Processes:* A comprehensive database gathering industrial, infrastructure and ecological processes that can be downloaded to drive resource flow analysis.

Moreover, being designed for urban-rural areas of up to 5 million inhabitants, the *resilience.io* tool puts greater emphasis on the relationship between local decisions and the way in which global events and developments

affect a given region. The linkages are assessed across three main clusters: a) the global supply chain resource patterns that flow in-and-out of a city-region, b) the global climate change impacts on weather and weather events, and c) the global impacts stemming from events such as supply chain disruptions, weather events, and commodity price spikes⁸⁶.

Thanks to a commitment by DFID to include provide funding for the prototype development, the open source *resilience.io* platform will be tested in Accra, Ghana, during the Future Cities Africa programme which is run by Cities Alliance and is part of the Future Proofing Cities framework. Accra's municipality is already relying on a preliminary diagnosis provided by *resilience.io* to design a project for improving Water Sanitation and Hygiene conditions in the Greater Metropolitan Area.

Similarly, The Ecological Sequestration Trust is planning to launch an Urban Development Investment Fund, that can bring institutional investors,

development finance, private investors and the public sector within cities together. This will work as a vehicle to initiate, develop and create projects in city-regions, using *resilience.io* to manage and provide the evidence for performance as well as a planning tool⁸⁷.



Understanding of Resilience: As it emerges from the *resilience.io* tool, The Ecological Sequestration Trust's stance towards resilience is clearly informed by a broad understanding of cities, both concerning the relationship between the urban-rural dynamics characterising their region and the interconnections between economic, societal and environmental ecosystems. Therefore, not only is the organisation well aligned with a systemic and cross-sectoral understanding of urban environments, but it also introduces fruitful entry points on the cross-scale linkages between (and within) the urban system and the regional or global transformations occurring in the economic and environmental realms.



4.1.4 De-linked Actors



FIGURE 4.5: De-Linked Actors.

BuroHappold Engineering



ID: BuroHappold Engineering is a private consultancy company operating in 23 locations worldwide and delivering innovative city solutions on a wide array of sectors, including economy, waste management, mobility, strategic planning, infrastructure, sustainability, water, environment, risk and resilience among others.



Commitment to Resilience: BuroHappold has been devoting increasing attention to resilience-building over the last biennium, with a concern for the challenges that cities, communities, organisations and buildings will need to confront amid rapid climate change, urbanisation and globalisation.

Relying on diverse teams of engineers, the company assists cities in formulating tailored resilience plans measured to meet the capability of societies, governments, economic systems, environment, physical infrastructure and resources. BuroHappold's risk-based approach breaks resilience down into demand and capacity, in order to profile the gaps and respond with integrated plans addressing multiple shocks and stresses. The resilience strategies envisioned by the company are intended to be coordinated, balanced, integrated and sustainable, with the long-term scope of enhancing the adaptive capacity of cities, neighbourhoods or buildings⁸⁸.

A good example of this approach is the resilience strategy that BuroHappold designed for the Hamad Bin Khalifa Medical City (HBKMC) in Doha, Qatar: a USD 10 billion project launched by the Qatari government to create a state-of-the-art healthcare system by 2030. Covering civil engineering, sustainability, security, logistics, waste, transport, environment, energy, water, drainage and IT, BuroHappold's Risk & Resilience team assessed a diverse set of hazards which the Medical City's

infrastructure may face, and calculated the business impact that each of these shocks or stresses may exert on the various masterplan's elements. These impacts were then mapped through a set of resilience diagrams and translated into a quantification of the disruptions that every hazard could produce on the system's other components. Eventually, a set of incident plans, business continuity plans and emergency response plans were formulated according to these evaluations⁸⁹.

Moreover, as of 2016, BuroHappold launched a diagnostic resilience tool for cities, with the scope of providing private and public stakeholders with a self-assessment instrument for current and future resilience demands, capabilities and gaps. The *Resilience Insight Tool* – which works as a free for use online platform, accessible through registration – provides an instrument to understand the overall demand on the resilience system and balance that against the city's capacity.

Building upon a systemic understanding of cities, the *Resilience Insight Tool* recognises three major urban elements – governance & economy, society & community, environment & infrastructure – each broken down into four components. The tool allows to select pertinent hazards to assess the respective resilience demand, as well as to diagnose the city's vulnerability and resilience capacity accordingly. Users can select the shocks and stresses deemed relevant to their city – health, infrastructure, natural, security, societal technology – and assess their cost, duration, probability, scale and severity, on a scale of one to five. Once the hazards have been scored and the assessment phase completed, the tool provides an overview of both the resilience demand and capacity per components, as well as an overall resilience rating. Finally, the *Resilience Insight Tool* provides also an estimated annual financial impact per shock and stress per million population, thus setting a business case for resilience-building⁹⁰.

Additionally, Burohappold has been collaborating closely with *Detroit Future City* (DFC) since 2010, assisting the non-profit platform in the definition of an integrated plan on economic redevelopment, land use, environmental and systems strategies to support long-term transformations.



Understanding of Resilience: Going beyond a traditional engineering definition of the concept, Burohappold defines resilience as *the ability to anticipate and adapt to shocks and stresses, implementing lessons learned to leverage emerging opportunities, and effectively reduce vulnerabilities.*

Inter-American Development Bank



ID: Founded in 1959 – and since then active to enhance socio-economic development and economic integration across Latin America and the Caribbean (LAC) – the Inter-American Development Bank (IADB, IDB or IBD) represents the main source of development financing for the LAC region. According to its 2016-2019 Institutional Strategy, the three main challenges that the Bank is poised to address in the next years are Social Exclusion and Inequality, Low Productivity and Innovation, and Limited Economic Integration. These challenges are further being tackled through three cross-cutting issues, namely Gender Equality and Diversity; Climate Change and Environmental Sustainability; Institutional Capacity and Rule of Law. The IDB's work is modulated according to a multi-disciplinary approach – spanning a wide array of disciplines⁹¹ – with activities including delivery of loans and grants, technical assistance and knowledge production through extensive research⁹².



Commitment to Resilience: As of April 2014, on the occasion of the 7th World Urban Forum (WUF) held in Medellin (Colombia), the IDB became part of the Medellin Collaboration on Urban Resilience (MCUR), joining forces with nine global partners⁹³, in order to build urban resilience and strengthen the social, economic and environmental capital of cities around the world. Moreover, as explained by Vicente Fretes Ciblis – Chief of the Bank's Fiscal and Municipal Development Division – at the side of the seventh WUF, the IDB's Urban Development and Housing strategy represents the responsible body for promoting environmental conservation, urban natural resources management and climate change adaptation, in strong coordination with MCUR⁹⁴. The strategy is currently focusing

on: 1) increasing city residents access to quality urban infrastructure and services, 2) improving urban population housing conditions, 3) preventing degradation and improving urban habitat, and 4) enhancing local institutions governance capacity.

Over the last decade, the IDB has been showing a proactive commitment to enhance climate change resilience and mitigation in the region: focusing mainly on energy, transport, agriculture and natural resources, disaster risk management and small island states. To reinforce its activities, as of 2011, the Bank created an *Integrated Climate Change Mitigation and Adaptation Strategy*, outlining the following five courses of action:

1. develop instruments to mainstream climate change in IDB operations,
2. strengthen the knowledge base for clients and staff,
3. expand lending and technical assistance in key sectors,
4. strengthen institutional frameworks, and
5. scale up investments, addressing financing gaps and leveraging private sector investments.

However, the IDB's portfolio on climate change has more focused on mitigation than on adaptation: with 67% of the total grants and loans being delivered to the former – mainly in the energy and transport sector – and 19% to the latter – distributed across agriculture and natural resources, disaster risk management, transport and climate change governance. The remaining 11% has been focused on initiatives related to governance and potentially feeding both adaptation and mitigation strategies. In nearly ten years, between 2004 and 2011, the total amount of climate change projects approved by the Bank was of USD 20.7 billion, distributed among public sector investment loans, private sector loans, policy-based loans, technical cooperation and investment grants.



Understanding of Resilience: As well reflected by IDB’s strong commitment to climate change adaptation and mitigation strategies, the Bank’s entry point on urban resilience is clearly characterised by an environmental perspective. The

latter – extensively articulated through the strategies exposed above – is also meant to increase the resilience of urban areas across the LAC region, benefitting from both the Bank’s work on urban development and from the platform created by the Medellín Collaboration on Urban Resilience.

International Federation of Red Cross and Red Crescent Societies



ID: The International Federation of Red Cross and Red Crescent Societies (IFRC) is a humanitarian aid organisation founded in 1919 as a result of cooperation between the International Red Cross (founded in 1863) and numerous National Red Cross Societies. As the third independent body of the overarching International Red Cross and Red Crescent Movement, it does not have authority over the additional two pillars, namely the International Committee of the Red Cross and the National Red Cross and Red Crescent Societies, but it supports the latter. The IFRC is led by Strategy 2020 – a collective plan of action to globally tackle the major humanitarian and development challenges, like poverty and hunger or social inclusion and peace, of the current decade.

The Framework holds three main goals:

- Supporting National Societies’ efforts to assist communities as they adopt risk-informed, holistic approaches to address their underlying vulnerabilities.
- Supporting National Societies’ efforts that encourage communities to adopt demand-driven, people-centred approaches to community resilience strengthening.
- Supporting National Societies to be connected to communities – being available to everyone, everywhere, to prevent and reduce human suffering.



Commitment to Resilience: In 2013, the IFRC declared that strengthening resilience should be a central component of the UN’s Post-2015 Development Framework. Adopting a holistic approach towards resilience, the Federation aims to address all vulnerabilities a system may suffer. Similarly, it considers resilience at multiple levels, from the individual and community to the global scales.

These three goals can be achieved through five steps:

1. Explore the three key elements of the Framework.
2. Review the information provided in the Framework’s Annex – which illustrates how IFRC activities contribute to achieving strengthened community resilience and suggests indicators to measure these activities.
3. Consider the specific context in which programmes/services are being developed.
4. Reflect this analysis in their programme design tools, such as Logframe.
5. Discuss with peers.

Nearly a decade ago, in 2008, the IFRC published its first *Framework for Community Safety and Resilience*. The Framework provided the National Red Cross and Red Crescent Societies with an approach to build projects, and enhance and adapt activities they were already carrying out. It was updated in 2014, with the objective of establishing “a foundation on which all IFRC programmes, projects, interventions and actions, across the contexts, which contribute to the strengthening of resilient communities can be created, developed and sustained”⁹⁵.

On a global level, the National Societies have carried out multiple actions aimed at strengthening resilience. These actions are often implemented or supported by third parties such as national authorities. As an example, the Singapore Red Cross has led the *Community-Led Action for REsilience* (CLARE) programme which mobilises and empowers volunteers to provide first response, first aid, elderly care and social services to vulnerable groups in their community, as well as eases access to various assistance schemes available in the neighbourhood.



Understanding of Resilience: The IFRC defines resilience as *the ability of individuals, communities, organizations or countries exposed to disasters, crises and underlying vulnerabilities to*

anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shocks and stresses without compromising their long-term prospects. More specifically, a resilient community is knowledgeable, healthy and can meet its basic needs, is socially

cohesive, has economic opportunities, has well-maintained and accessible infrastructures and services, can manage its natural assets, is connected.

The IFRC's understanding of resilience has grown to recognise the ever-evolving and dynamic nature of communities and the underlying vulnerabilities that challenge them. The Federation holds a holistic, cross-disciplinary, cross-level approach that takes account of how factors influence one another.

Lloyd's



ID: Lloyd's is a British corporate body specialised in insurance and reinsurance activities. Its corporative structure provides a unique platform for both corporations and private individuals to come together for pooling and sharing risks⁹⁶.



Commitment to Resilience: Lloyd's commitment to resilience is well reflected by the *City Risk Index 2015-2025*⁹⁷ which was developed to stimulate coordination between governments, insurers and the business community, in order to promote awareness of risk, facilitate post-event recovery and build resilience, in urban environments.

The *City Risk Index 2015-2025* builds upon original research carried out for Lloyd's by the University of Cambridge Centre for Risk Studies, with the purpose of showing how governments, businesses and communities should better prepare to face risks and increase their resilience. Whilst initially analysing the exposure of 301 leading world cities to 18 threat categories, the report has been updated early 2017 in the *Cambridge Global Risk Index 2017* to include 4 more categories. The City Risk Index creates an estimate of urban vulnerability based on the innovative metric *GDP@Risk*, which calculates the potential impact that a natural or man-made hazard could exert on a city's economic output. According to the index, the economic impact of these hazards on the 301 examined cities could be of USD 4.6 trillion

between 2015 and 2025. This value was calculated on a projected total GDP of USD 373 trillion. Eventually, the report sets some major guidelines for building resilient institutions and robust infrastructures, stressing the key role that insurance solutions should play for this purpose. Here following are the most relevant:

- A 1% rise in insurance penetration translates into a 13% reduction in uninsured losses – a 22% reduction in taxpayers' contribution following a disaster.
- Insurance improves the sustainability of an economy and leads to greater rates of growth – a 1% rise in insurance penetration leads to increased investment equivalent to 2% of national GDP.
- Insurance takes the financial burden of recovery off the taxpayer and boosts economic growth.



Understanding of Resilience: As a leading insurance and re-insurance platform – specialised in pooling and transferring risks – Lloyd's is more concerned with shocks than stresses, as well as with *the ability of a given urban centre to restore its economic functions in the shortest possible time after a disaster.* Clearly starting from an economic resilience perspective, the City Risk Index also provides some critical insights about how insurance corporate bodies/companies could play a role in improving cities' financial ability to withstand hazards of various sorts.

BOX 4.3: City Risk Index 2015-2025 Categories.

The total 22 include drought, earthquake, flood, freeze, heatwave, human pandemic, cyberattack, market crash, nuclear accident, oil price shock, power outage, plant epidemic, solar storm, sovereign default,

terrorism, tsunami, volcano and (temperate and tropical) windstorm, commodity price hikes, social unrest, interstate conflict and separatism conflict.

4.2 GLOBAL RESILIENCE PARTNERSHIPS AND ALLIANCES

4.2.1 Global Alliance for Urban Crises

The Global Alliance for Urban Crises (GAUC) is a multi-stakeholder initiative emerging from the World Humanitarian Summit in Istanbul in 2016 and geared to provide knowledge, build capacities and formulate approaches, in order to cushion the impacts of humanitarian crises on urban ecosystems. The platform, which gathers a diverse array of development actors, urban professionals and local authorities, frames an inclusive vision of safe, resilient and sustainable cities, well aligned with the 2030 Agenda for Sustainable Development⁹⁸.

The *Urban Crises Charter* – the Global Alliance’s final instrument – provides key policy and operational guidelines to drive members’ actions in preventing, preparing for and responding to humanitarian urban

crises. From an urban standpoint, it addresses some of the currently most urgent humanitarian challenges, from refugees and internally displaced people to urban conflicts and disasters. The Charter:

- prioritises local administrations and promotes participation of all the urban stakeholders;
- adopts urban resilience as a common framework to align human rights, humanitarian and development goals;
- manages urban displacement as a combined human rights, development and humanitarian concern;
- builds partnerships between city, national, regional and global levels across disciplines and professions and ensures involvement of local government and professional associations⁹⁹.

4.2.2 Global Facility for Disaster Reduction and Recovery

Launched on 29 September 2006, to support the implementation of the Hyogo Framework for Action 2005-2015, the Global Facility for Disaster Reduction and Recovery (GFDRR) is a partnership of 36 countries and 11 international organisations, established to assist developing countries in reducing their exposure to natural hazards and climate change. Managed by the World Bank Group on behalf of GFDRR’s donors and partners, the partnership works as a grant-making facility tasked to understand risk, improve disaster governance, emergency preparedness and recovery in developing countries, and invest in disaster risk reduction for resilience. GFDRR’s active portfolio for 2016 amounted to USD 240 million which it delivered in the form of grants to government agencies, development actors and civil society organisations in more than 70 countries around the world¹⁰⁰.

The organisation – incorporating recent international agendas such as the Paris Agreement, the Sustainable Development Goals, and the Sendai Framework for Disaster Risk Reduction 2015-2030 – is particularly committed to integrating development strategies and investment programmes with disaster risk management and climate change adaptation, as well as to improving the quality of resilient recovery and reconstruction in a disaster’s aftermath. To achieve this, GFDRR works with a network of over 400 local, national, regional and international partners.

The GFDRR’s agenda for the upcoming years is outlined by a biennial plan (2016-2018), entitled *Managing Disaster Risks for a Resilient Future - A Work Plan for the Global Facility for Disaster Reduction and Recovery*. The latter sets a pathway for developing countries to withstand natural hazards and climate change and concerns an investment of a projected USD 286 million.

Furthermore, in 2011, the GFDRR launched the Open Data for Resilience Initiative aiming to promote a global open data movement, in order to facilitate reducing vulnerability to natural hazards and the impacts of climate change. The Initiative has developed tools to improve the sharing, collecting and using of data and supports GFDRR and World Bank Regional Disaster Risk Management Teams to build capacity and foster long-term ownership of open data projects in client countries.

Finally, the GFDRR is also part of the Medellin Collaboration on Urban Resilience (MCUR), which was announced during the 7th World Urban Forum in Medellin, Colombia in 2014. The MCUR includes UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance.

4.2.3 Medellin Collaboration on Urban Resilience

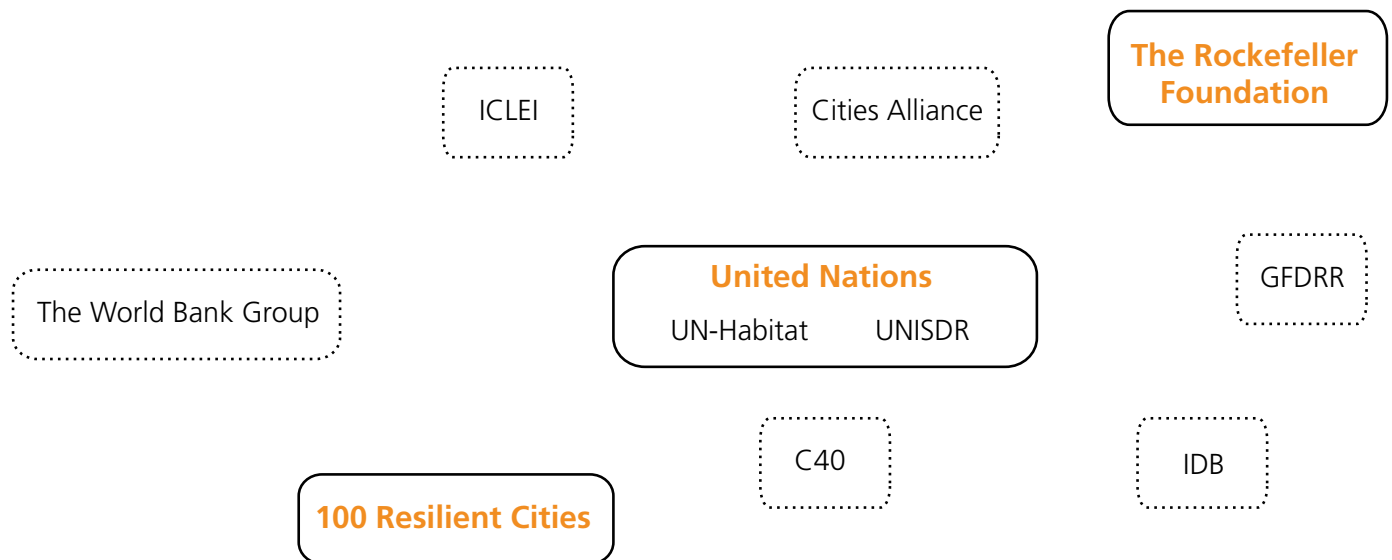


FIGURE 4.6: Medellin Collaboration on Urban Resilience Network.

Announced on the occasion of the 7th World Urban Forum in Medellin, Colombia in 2014, the Medellin Collaboration on Urban Resilience (MCUR) presently gathers the ten most prominent actors committed to resilience globally: UN-Habitat, UNISDR, The World Bank Group, Global Facility for Disaster Reduction and Recovery, Inter-American Development Bank, The Rockefeller Foundation, 100 Resilient Cities, C40, ICLEI and Cities Alliance¹⁰¹.

Working across 4,000 cities globally and leveraging more than USD 2 billion of existing annual funds, these actors are at the cutting edge of sustainable urban growth and development, and stimulate an unprecedented effort towards resilience across multiple sectors and scales. Well aligned with the Post-2015 Development Framework – including the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction, the Addis Ababa Action Agenda, the Paris Agreement and particularly the New Urban Agenda – MCUR’s cross-sector targets range from comprehensive data gathering to local government disaster preparedness, and from the

development of major security standards to more efficient ecosystems services. Thus, the Collaboration is working to enhance the flow of knowledge and financial resources necessary to improve cities’ resilience to natural and man-made disasters, as well as a variety of stresses related to climate change, migration, rapid urbanisation and other socioeconomic challenges.

BOX 4.4: World Urban Forum.

The World Urban Forum is a meeting organised by UN-Habitat in a different city every two years, in order to tackle the most pressing urban issues facing human settlements around the world; including rapid urbanization and its impact on cities, communities, economies, climate change and policies. The conference's theme for Medellin, Colombia in 2014, was 'Urban Equity in Development – Cities for Life', a framework within which urban resilience was of great relevance. Both the Medellin conference and the consequent establishment of the Medellin Collaboration on Urban Resilience (MCUR) represented two critical steps on the path to Habitat III.



World Urban Forum 7 in Medellin, Colombia.
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Storm coming over Saigon, Vietnam.

CHAPTER 5

Case Studies



CHAPTER 5

Case Studies

Spanning the public, private and non-profit sector, and ranging from research institutions to international and inter-governmental agencies, the thirty or more actors mapped in the previous chapter reflect the collaborative potential that a global momentum for resilience can unleash, particularly when it comes to sustainable urban development. As clearly emphasised by the New Urban Agenda, cooperation across sectors and different scales of governance is a critical step in order to build integrated urban systems, as well as to enable cities to pursue sustainable patterns of urban development.

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Building upon these assumptions, yet with a more action-oriented scope, the following section provides a critical overview of urban practices that – while not necessarily informed by the previously mapped actors – could be inserted in the conceptual frameworks depicted above. The eight selected case studies that follow are deemed representative of the diverse spectrum of actors, policies and practices that resilience-thinking can stimulate when applied to urban environments. Whereas the previous chapters explored the genealogy of the concept, from theory to development agendas and from the latter to actors, the following review proposes a set of geographically and thematically balanced positive urban practices attributable to this framework of reference.

Consequently, the scope of this section is to propose a well-assorted array of urban solutions that, leveraging the interconnectivity of urban elements and a shared integrated understanding of human settlements, exhibit a proactive stance towards challenges – whether

internal or external, socioeconomic or environmental, and whether citywide or at the neighbourhood scale – as well as a positive determination to turn them into transversal opportunities on the long-run.

Within these common boundaries, while local governments such as Johannesburg, Toyama or Yakutsk have positioned resilience centrally in their programme – aligning their policies with international agendas and actively engaging with some of the actors mapped above – the other cities, Bossaso, Detroit, Guayaquil and Riace, as well as the island nation of Kiribati, experienced more independent policy trajectories. Setting successful cases for multi-scale stakeholders' interaction, designing forward-looking strategies to maximise the impact of public/international funding, re-directing urban growth according to local and supra-local events and, more generally, providing locally-grown solutions to both internal and external urban challenges.

MAP 5.1: Global Map of Case Studies.



5.1 BOSSASO, SOMALIA



Context and challenges

As one of Somalia's major economic hubs, also home to the largest telecommunications company in the country, Bossaso – located on the Gulf of Aden coast – is the capital of the Bari region and the largest urban area in the autonomous state of Puntlandⁱ. Over the last two decades the city has benefitted considerably from the commercial and fishery activities tied to its port, as well as from a growing housing industry due to a rapidly increasing population. Although precise figures have not been accurately recorded since 2010, Bossaso's urban area experienced a massive demographic expansion over the last quarter century, emerging as a regional transit point for international migration and affected by an extraordinary influx of internally displaced people from the early 1990s onwardsⁱⁱ.

Following the collapse of Siad Barre's regime¹ in 1991 – and the consequent power vacuum – Somalia entered in a spiral of intense civil strife, which is still ongoing presently. Through repeated waves of violence and due to the encroachment of a wide array of war actors – from local clans to foreign players – the conflict raged severely in southern and central regions, and led to extreme territorial and political fragmentation across the whole country. The city of Bossaso, and the Puntland region in general, exhibited a relatively safer and more stable political context, experiencing only limited military confrontations tied to territorial disputes between Puntland and Somaliland².

The national security gap between the Somali north-eastern peninsula and the country's central and southern regions, coupled with the economic attractiveness of Bossaso, contributed to turning the city into the easiest destination to reach for those fleeing from violence in war-affected areas. Through repeated and continued migratory waves, thousands of Somali households have settled in Bossaso since the early 1990s and the city has been emerging as a transit point in the broader migrant routes, linking Africa and Asia to the Gulf, the Middle East and Europe³.

ⁱ Extending on the north-eastern peninsula of the country, the Puntland State of Somalia declared independence from Mogadishu on 5 May 1998 and is now part of the Federal State of Somalia.

ⁱⁱ Official data on population are lacking since UN-Habitat's 2010 estimates – based on satellite imagery. At that time, the population was recorded to be around 160,000, of which 25,000 IDPs. Over the last decade, the influx of people – as a result of ongoing civil war in the central and southern regions – is likely to have considerably increased these figures.



MAP 5.2: Bossaso, Somalia.

Since the early 2000s, the City of Bossaso has been confronted by the major challenge of urban integration as a result of continual influxes of IDPs gathering at the city's outskirts and giving shape to large strips of informal settlements with limited sanitation, lack of public services and insecurity of land tenure.

This challenging humanitarian context was aggravated by a severe and prolonged drought hitting the central regions in 2001 as well as by recurring riverine floods between southern Somalia's Juba and Shabelle rivers over 2009. These combined factors added another root of displacement to the situation depicted above and following a 2010 field mission to Somalia, the UN Representative of the Secretary-General, Walter Kälin, estimated that there were 1.5 million internally displaced persons (IDPs), 100,000 of which in Puntland alone.

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Owing to an absence of public open land, the 32 spontaneous settlements rising across the urban area – in and around the city's consolidated fabrics – were built only on private plots, rented by local landowners to newcomers. This situation resulted in a highly fragmented urban landscape, which when coupled with

an unregulated and contested land property market, made it difficult for local authorities to both secure land tenure and formulate a comprehensive strategy on IDPs. Moreover, various field sources reported that in order to maximise rent revenues, landlords made the population density of their properties as high as possible, thus exponentially increasing people's exposure to health and fire hazards⁴.

Furthermore, on the occasion of an official visit to the city in 2004, the then Director of the Internal Displacement Division of the United Nations Office for the Coordination of Humanitarian Affairs, Dennis McNamara, defined Bossaso's informal areas as 'one of the world's most neglected and desperate humanitarian situations', with cholera out of control, an almost complete absence of latrines and other sanitation facilities, evidence of sexual violence against women and high exposure to urban fires, amongst others⁵. This critical humanitarian situation on the urban fringes is intensified by the continued pace of new arrival, putting the city's already fragile infrastructure under severe stress.

The Cluster approach

As of May 2006, following a large urban fire that displaced over 500 families in the ‘100 Bush’ settlement – Bossaso’s western urban fringes – local authorities issued a proposal to resettle the affected households to a new rural site, 10 kilometres South of the city. The proposal was eventually not implemented as it was deemed both unsustainable in terms of infrastructure and service supply costs, as well as conducive to the socio-spatial and economic segregation of the displaced communities. Instead, authorities took advantage of that hazardous event to ‘build back better’ and it soon became clear that a more concerted effort was required to address the challenges that high numbers of IDPs could pose to the resilience of Bossaso’s urban system. A Cluster Approachⁱ was thus adopted in 2006 in order to tackle the urban challenges and coordinate actions among the various stakeholders in the field.

ⁱ Clusters are groups of humanitarian organisations, both UN and non-UN, in each of the main sectors of humanitarian action, e.g. water, health and logistics. The Cluster Approach was firstly introduced in Somalia in 2006.

The United Nations Human Settlements Programme (UN-Habitat) and the Office of the United Nations High Commissioner for Refugees (UNHCR), co-chaired the Shelter Cluster, which included the Danish and Norwegian Refugee Councils among other NGOs.

The intervention focused on four main priorities, namely 1) the re-planning of settlements according to sound building and security codes, 2) the distribution of less inflammable and provisional shelter kits, 3) the delivery of basic training on settlement planning and fire prevention, and 4) the negotiation with local authorities and land owners⁶.



Road in the centre of Bossaso, Somalia.
© UN-Habitat

From challenges to opportunities

Following identification of informal areas and an assessment of the people living in them, UN-Habitat took responsibilities for negotiating land issues with the local government and the relevant stakeholders, and inscribed the process into a wider urban expansion plan for the city. In order to profile the scope of intervention and design cross-sectoral strategies for future development, the Bossaso City Consultation was established, gathering representatives from the central and local authorities, NGOs, private sector, local and traditional leaders, displaced communities and the Shelter Cluster committee. Since the majority of the informal areas addressed were situated on the city's eastern flank, an eastward urban development trajectory was proposed, with the long-term aim of socially and spatially incorporating the spontaneous settlements in the urban system. Additionally, an incremental land tenure strategy was envisioned to strengthen the link between the social and the urban fabrics.

An incremental land tenure strategy was envisioned to strengthen the link between the social and the urban fabrics.

Based on the rationale that the plan would increase the value of land in the area, local businesses and leaders were persuaded to donate part of their properties to the municipality, thus fostering internal economic growth in the city and providing donors with long-term economic returns. Ownership of donated lands was transferred to the municipality and reallocated by the latter to displaced families, who were guaranteed with full property over houses only fifteen years after reallocation. In case of land abandonment before the expiry of the period, property would return to the municipality and be reallocated according to the same patterns of distribution.

The proposed urban development pattern was directed to a more compact and socially-cohesive urban environment, with an expanded infrastructure and service network, a more cost-effective administration and more local development opportunities.

Local building companies were contracted to lay the foundations of new – with proper water supply, sanitation systems and following building codes – while humanitarian actors such as the Norwegian Refugee Council, the Danish Refugee Council and the United Nations High Commissioner for Refugees provided the resettled households with provisional flame-proofed shelter as part of a permanent relocation strategy.

Families benefiting from these actions were actively involved in the construction process and encouraged to gradually invest in upgrading their properties, whereas local markets, school, mosques and green areas were also built by humanitarian agencies. For the sustainability of the project, the relocated families would be subjected to municipal laws, building codes and the payment of tax fees, yet would obtain their building permits for free as part of the resettlement arrangement.

Simultaneously, the strategic urban planning guidelines put forward by UN-Habitat spanned urban governance, economic development and basic services – mainly public transport, garbage collection, water and electricity supply – in order to tackle the challenges faced by the city. The proposed urban development pattern was directed to a more compact and socially-cohesive urban environment, with an expanded infrastructure and service network, a more cost-effective administration and tax-collection systems, minimum vacant land within the city's boundaries and more local development opportunities.

The experience of Bossaso sets a positive case for bridging the gap between humanitarian intervention and sustainable urban development. The experience provides a model to anticipate the integrated and holistic understanding of urban systems and is in-line with resilience-thinking that has gained greater prominence in the 2030 Agenda.

Drawing upon the principle of ‘building back better’ and conceiving post-hazard reconstruction as an opportunity, the city fostered a more inclusive strategy towards IDPs and displaced communities were involved in the urban redevelopment process as a pivotal vector of growth. Consequently, further IDPs segregation was prevented and the displaced communities were made part of the upgrading process.

The experience of Bossaso sets a positive case for bridging the gap between humanitarian intervention and sustainable urban development.

An incremental land tenure strategy was enforced, collaboratively engaging with the municipality, the private sector and the IDPs and resulting in long-term solutions that stimulated socio-economic and socio-spatial integration over the following fifteen years. Humanitarian funding was directed to support both a permanent shelter approach and the construction of public and religious facilities in the upgraded areas. Anchoring these long-term policies into a broader urban expansion plan helped redirect Bossaso’s growth eastward where the majority of informal areas are located. In November 2016, the first Urban Expansion Plan for the city was launched, designed with UN-Habitat’s support⁷.

The positive outcomes that these strategies produced in the long run were visible through the increasing number of landowners willing to share portions of their properties and the number of displaced people autonomously purchasing land in the city on a regular basis. Four years later, nearly 1,700 households (over 11,000 people) had purchased land in the IDPs’ settlements or in Bossaso’s outskirts, according to the Norwegian Refugee Council.

Although IDPs’ urban integration in the city did not correspond with a resilience-informed development discourse, the outcomes produced by a successfully implemented Cluster Approach were highly consistent with its scopes. This could not have been obtained without including all the actors on the ground – local private companies and public institutions, as well as international agencies – into a common strategy spanning humanitarian assistance, shelter provision, incremental land tenure approaches, informal settlements’ upgrading and urban planning.



Refugees camp in Bossaso, Somalia.
© Flickr/GMM Geografija

5.2 DETROIT, UNITED STATES OF AMERICA



Context and challenges

As of July 2013, in what was the largest municipal insolvency the United States ever experienced, the City of Detroit filed for Chapter 9 protectionⁱ, with an estimated USD 18 to 20 billion in debt. Not only did bankruptcy represent the Motor City'sⁱⁱ low peak after 60 years of relentless demographic and economic decline, but it also offered some unique lessons regarding the resilience of post-industrial cities in developed countries.

There are many causes at the root of Detroit's predicament. Kevyn Orr – the emergency financial manager assigned in 2013 – pointed for instance at a shrinking tax-base due to population decline, heavy spending on retirement benefits, excessive borrowing to cover budget deficits and government corruption among others. Yet, from a resilience perspective, Detroit offers a particularly interesting case of economic monoculturalisation, as well as various insights into the long-term challenges this can unleash at the urban system scale.

ⁱ The purpose of chapter 9 is to provide a financially-distressed municipality protection from its creditors while it develops and negotiates a plan for adjusting its debts.

ⁱⁱ As the automobile industry's capital and home of the 'Big Three' – namely Ford, Chrysler and General Motors – Detroit has been commonly referred to as the Motor City over the whole 20th century.

Detroit's rise and fall follows the trajectory of its automobile industry: too dominant during the 1950's to stimulate other local clusters of entrepreneurship, yet too vital for the city's economy to wane without collateral consequences. The Motor City lost more than half of its urban population in less than 60 years, falling from being home to 1.8 million people mid-20th century to a low peak of 700,000 inhabitants in 2013. Such a demographic contraction – which has not yet been inverted – can be explained by four major issues; namely, de-industrialisation, continuous increases in taxation, skyrocketing unemployment and social insecurity⁸.

From a systemic understanding of cities it would be hard to identify a direct consequentiality among these factors, a general push towards de-industrialisation – which transformed the landscape of many American cities over the second half of the 20th century – certainly played a prominent role in triggering Detroit's urban decline⁹. In the first stage, the major automobile industries – Ford, Chrysler and General Motors, also called the 'Big Three' – started moving production out of the city, both as a strategy to spatially diffuse the trade union's cohesion and as the dependency



MAP 5.3: Detroit, United States of America.

Detroit's rise and fall follows the trajectory of its automobile industry: too dominant during the 1950's to stimulate other local clusters of entrepreneurship, yet too vital for the city's economy to wane without collateral consequences.

on river ways and railroads declined compared to previous decades. Decentralisation of the automobile industry, and of the industrial sector in general, had major impacts on the city's socio-economic geography. Between 1945 and 1957, the Big Three built 27 new factories in Detroit's metropolitan area – yet outside of the city's boundaries – triggering a process of rapid suburbanisation and depopulation of many working-class neighbourhoods.

As the automobile industry started facing serious economic difficulties, especially in the wake of the 1970s' energy crisis, no other sector could keep the city's economy afloat, unemployment increased further¹⁰ and more people left. These profound transformations in the city's economic functioning resulted in a relentless outflow of people, consequent abandonment of broader urban plots, exacerbation of racial tensions, socio-spatial segregation, failure of many urban services and overall social insecurity for larger and larger areas¹¹.

Moreover, looking at the urban crisis from a broader scale, Detroit's inability to invert its decline also has to be inserted in the American context: wherein cities are

mainly reliant on their own tax-base – as they receive little federal funding – and often borrow from third actors, increasing their propensity to contract higher debts¹². As Detroit's political leaders started facing depopulation and a de facto shrinking of the city's tax-base, they responded by creating new taxes and raising existing ones, as well as resorting to extensive borrowing from the early 2000s onwards. Between 1962 and 2012, the Motor City lost 40% of fiscal revenues and by 2012 had already borrowed up to USD 8 billion. Eventually, the 2008 financial crisis made this predicament even more dramatic.

When the City of Detroit filed for bankruptcy in July 2013, its population had shrunk by more than half in the preceding 60 years, its urban area counted 78,000 abandoned buildings, its murder rate was the highest in 40 years, its inhabitants could wait an average of 58 minutes for the police to respond calls – compared to a national average of 11 minutes – two-thirds of its ambulances were not working and almost half of its streetlights were broken. Since the early 2000s, Detroit was portrayed by journalists and commentators as a 'war-torn city'.

The Detroit Future City Initiative

Within that context, while the people of Detroit started comparing their post-bankruptcy city to New Orleans after Hurricane Katrina – defining themselves as victims of a “slower and man-made urban disaster [...] but not less disastrous” – a timid process of recovery was initiated. Rather than being mirrored by slowly improving economic figures or by a slow return of jobs to the former Motor City – on which media commentaries and business operators put greater emphasis – recovery feeds on a broader change in perspective.

As of January 2013, the DFC Strategic Framework was released, delivering an ambitious and shared vision for Detroit’s future and aligning local assets with opportunities in a holistic and interconnected way.

The pulse for this regeneration was given by *Detroit Future City* (DFC): a broad-based community of experts formed in 2010 and proactively committed to designing comprehensive and long-term solutions for redressing the city’s urban decay¹³. As of January 2013 – following a 24 month-long public process and preceding by 6 months the city’s bankruptcy – the DFC Strategic Framework was released, delivering an ambitious and shared vision for Detroit’s future and aligning local assets with opportunities in a holistic and interconnected way. A year later, the DFC Implementation Office was established as an independent non-profit organisation, to assist and facilitate the strategies formulated by the Framework, as well as to liaise between the city’s stakeholders and its funding partners. Consequently, DFC benefits from the support of several foundations¹⁴ and from a tight collaboration with the Michigan State Housing Development Authority, the Detroit Economic Growth Corporation and the City of Detroit¹⁵.



Abandoned building in Detroit, United States of America.
© Flickr/Nitram242

From challenges to opportunities

Although in the 761-page book published by DFC resilience is only marginally referenced as a concept, the vision delivered by the Strategic Framework is well-aligned with a system-based understanding of urban environments; wherein the city elements, scales and stakeholders are assessed as interlinked and interdependent bodies. Consequently – and herein lies the main rupture with Detroit’s past – DFC embodies the very first attempt in 60 years to look at Detroit as a system of systems, and not only in silos, from the standpoint of land use or economic planning.

DFC featured as the very first attempt to re-think Detroit as a 600,000 residents urban centre, that will not recover its 2 million population in the near future.

Moreover, DFC shows remarkable awareness and realism in acknowledging that massive unemployment and demographic contraction inevitably lead to urban reconfiguration, thus featuring as the very first attempt to re-think the Motor City as a 600,000 residents urban centre, that will not recover its 2 million population in the near future¹⁶. Building on these assumptions, the Strategic Framework does not overlap or compete with the legally mandated Master Plan of Policies approved by the Municipality in 2009, rather it is tasked to inform and integrate its implementation from a policy perspective, providing an action-oriented blueprint and flexibility mechanisms for all the involved actors¹⁷.

On a more detailed level, the DFC integrated approach unfolds across 12 Imperative Actions – which transversally address all the aforementioned urban challenges – and embraces six planning elements: Economic Growth, Land Use, City Systems, Neighbourhoods, Land and Building Assets, and Civic Capacity. Throughout this structure, diversification – whether in economic, social, spatial or typological terms – clearly stands as the cornerstone of the plan.

Accordingly, while economic and land use challenges are certainly acknowledged as the most urgent issues to address, they are tackled through their interconnections with the broader urban ecosystem, assessing their relationship with social equality, inclusion, environment and participation at the neighbourhood scale.

When it comes to the economy, DFC is proactively committed to fostering a return of jobs and businesses in the city, in order to both strengthen its tax-base and attract new residents. Drawing upon the assumption that “Detroit is not too big, [but] its economy is too small”, the Strategic Framework identifies 7 Employment Districts, where businesses are already improving, and proposes to leverage on four broad sectors: digital and creative jobs, local entrepreneurship, education and medical services, and local industry (including both new technologies and traditional local assets). In addition, the Framework encourages investments in two promising and rapidly emerging industries, namely CDER (Construction, Destruction, Engineering, Repurposing) and urban farming, while showing how economic diversification is inherently tied to both land management and neighbourhood revitalisation. With 24 square miles of vacant land – roughly corresponding to 7% of its urban area (or to the size of Manhattan in New York City) – the City of Detroit has no other choice but re-thinking its land management approach, in order to trigger re-population and economic recovery.

“Finding ways to transform property into something productive strengthens the economic capacity of the abandoned areas”.

*– Anika Goss Foster,
Executive Director of the DFC
Implementation Office*

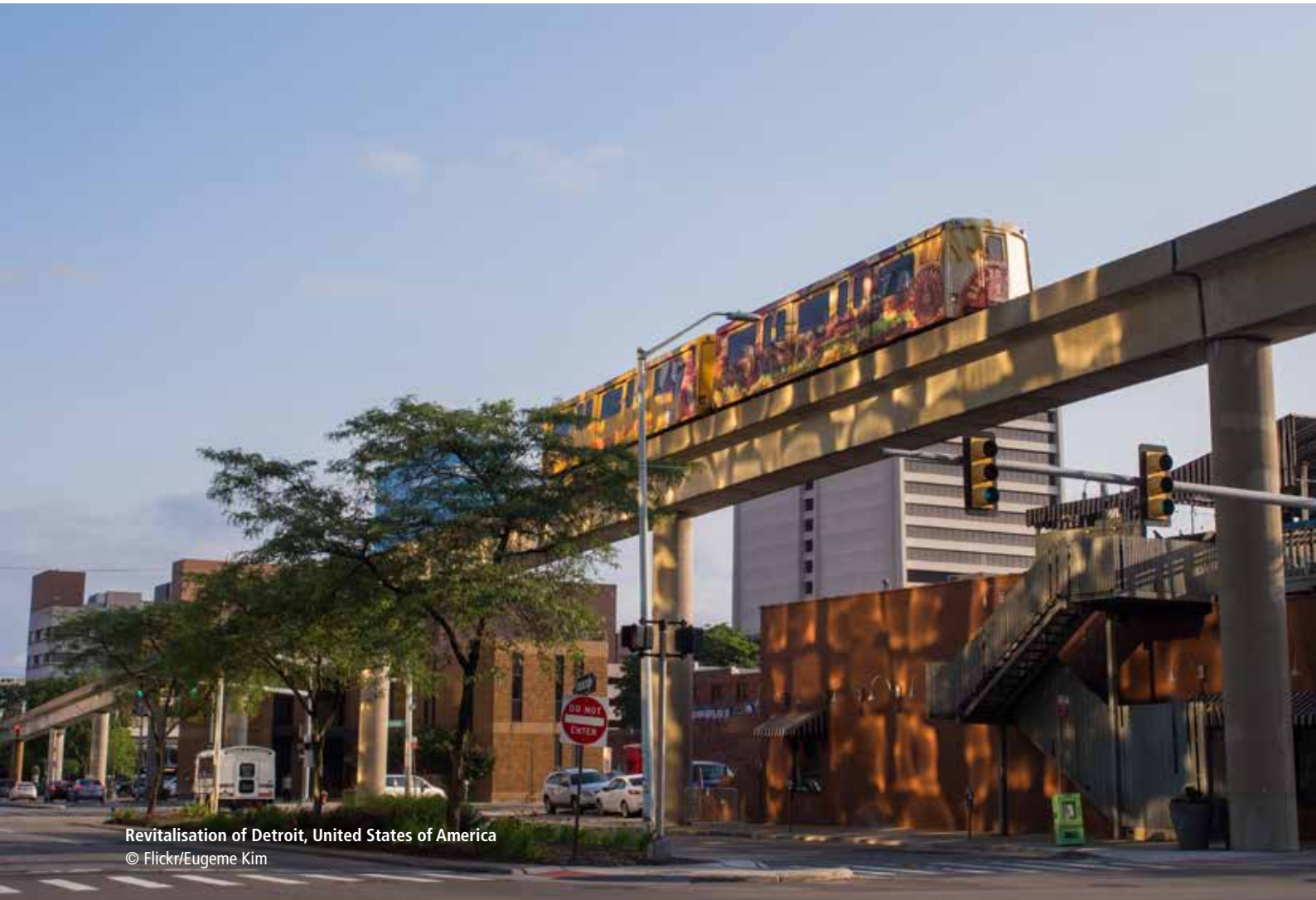
Acknowledging demographic contractions is the first major step, yet as elucidated by Anika Goss Foster – Executive Director of the DFC Implementation Office – “finding ways to transform property into something productive strengthens the economic capacity of *the abandoned areas*”. In this light, and assisting the municipally-designed Master Plan of Policies, the Strategic Framework is tasked to geographically align the city systems and networks. Given the city’s large extension and high reliance on private cars due to limited and expensive public transports, a more affordable and environmentally sustainable restructuration of water, waste, energy and transportation networks is needed.

The DFC Strategic Framework shows an unprecedented ability to understand that economic and demographic transformations need to be accepted in order to start thinking of a new urban future.

At the sub-local scale, these policy guidelines – which are a result of two years of tight community engagement and conversations – are expected to produce socio-spatial and economic diversity, both within and across neighbourhoods. In particular, DFC focuses on tackling the worsening environmental and social conditions experienced by the city residents, as well as on fostering more sustainable urban densities. This will be informed by the awareness that Detroit’s urban decline is not a monolithic process and that each neighbourhood of the city has been experiencing locally-specific challenges. Each strategy has thus to be tailored according to the neighbourhood’s specific needs, while being simultaneously inserted into the broader spectrum of objectives postulated by the Strategic Framework, in collaboration with the master plan in force.

Finally, in order to further encourage people’s engagement, DFC has been making greater efforts to stimulate local stewardship and participation at the community scale. The *Working with lots: Mini Grant Program* provides a clear example of these efforts, delivering up to USD 6,500 in grants to people, or groups of people, willing to turn vacant land into community assets¹⁸.

The strength of Detroit Future City is to pose itself in dialectical continuity with both the city’s glorious past and the six decade-long urban decline that it has been experiencing since mid-20th century. Unlike previous municipal attempts to redress Detroit’s history, the DFC Strategic Framework comes to terms with it, showing an unprecedented ability to understand that economic and demographic transformations need to be accepted in order to start thinking of a new urban future. Leveraging on an extremely diverse platform of partners and benefitting from a high degree of coordination with the City of Detroit, the DFC Implementation Office is thus managing to capitalise on existing local assets, in order to stimulate economic and geographic diversification at the neighbourhood scale. From this perspective, the urban crisis has been dealt with as a critical, yet potentially constructive, juncture in Detroit’s urban history, acknowledging the mistakes of the past, together with the social, spatial and economic shocks or stresses they unleash on the city’s ecosystem; correcting deficiencies and translating urban challenges into cross-cutting opportunities for all purposes.



Revitalisation of Detroit, United States of America
© Flickr/Eugeme Kim

5.3 GUAYAQUIL, ECUADOR



Context and challenges

Although not the administrative capital of Ecuador, the city of Guayaquil makes up the nation's most populated city – home to approximately 2.65 million residents – as well as houses one of the busiest ports in the Latin American and Caribbean region. Generating about 25% of the annual national GDP, Guayaquil constitutes the country's main economic hub¹⁹.

In the 1960s, the port in the city centre closed and activity relocated to the new port to the south, capable of handling ships with greater draft. Even though the business district remained in the centre, the loss of the riverfront's economic activities coupled with a lack of coordination in urban planning led citizens to gradually abandon the waterfront of the river Guayas. The elites residing in the city centre started moving towards the north of the city and the urban core became less and less residential and ever more deserted after office hours²⁰. Modern offices replaced the 20th-century residential buildings along the waterfront for tertiary functions. Even during the 1970s oil boom period, the centre was unable to redeem its multifunctional character as the influx of migrants mainly settled in the periphery.



MAP 5.4: Guayaquil, Ecuador.

The centre of Guayaquil had been experiencing a process of steady abandonment and deterioration for thirty to forty years. Inhabitants had lost pride and respect for their city and felt insecure towards the future of the ‘Pearl City’.

Following the re-establishment of democracy in Ecuador in 1979, political power and resources were decentralised. Intertwined with nationwide corruption, this decentralisation destabilised politics both nationally and locally, and left local administrations struggling to adopt autonomy. In addition, the oil crisis of the 1980s deteriorated the economy causing real estate stagnation as well as increasing unemployment and, consequently, a nationwide and international migratory movement towards cities. In Guayaquil, this led to 1) the rapid informal urbanisation of the hills surrounding the city as well as 2) a citywide process of decay that was aggravated by criminality and corruption. Gradually, Guayaquil lost its reputation as the ‘Pearl City’, given by citizens out of their pride and appreciation for the city’s beauty.

By the 1990s, the continued urban degradation and lack of planning had become manifest in increased traffic congestion and limited parking spaces, a large presence of informal sellers and markets, scarce green space, insufficient garbage collection, inadequate water and sanitation infrastructure, and contamination of the river Guayas. The centre of Guayaquil had been experiencing a process of steady abandonment and deterioration for thirty to forty years. Inhabitants had lost pride and respect for their city and felt insecure towards the future of the ‘Pearl City’. As the issues encountered by Guayaquil may not be unfamiliar to other rapidly urbanising cities in developing countries around the world, how Guayaquil overcame city centre decay whilst dealing with rapid peripheral urbanisation may well serve as an example for resilience in this sense.

The participative model of the Malecón Simon Bolívar

When former president of Ecuador, León Febres-Cordero, took office as the mayor of Guayaquil in 1992, he wanted to restore the city's image as well as citizens' self-esteem through an urban regeneration process. Using his knowledge on the procedures of decentralised politics, he worked towards establishing an effective municipal autonomy. As city funds were at an all-time low, Febres first reorganised the city's finances and administration. Next, he installed a civic campaign to tackle the issue of citizens' appreciation of their city. Furthermore, a garbage collection strategy was set up and public services related to waste management were subcontracted to the private sector. Febres also conceived a new green areas department that approached the urban revitalisation from the idea of a network of green spaces – until the idea was integrated in plans for the regeneration of the Malecón Simon Bolívar.

When La Previsora, a local private bank, proposed a large-scale urban renovation project in honour of the bank's 75th anniversary, the mayor refocused the

city's beautification on the waterfront, rather than on the entire city centre. Accordingly, La Previsora hired a team of urban experts from Oxford Brookes University (United Kingdom) to develop a waterfront regeneration plan, called 'Image-Objective', for the redevelopment of the Malecón Simon Bolívar, a 2.5km-long promenade.

Chaired by the mayor and consisting of members from public and private institutions and civil society, the Foundation Malecón obtained large operational power due to the commitment of the mayor to reduce legal and economic barriers.



Revitalised Malecón Simon Bolívar in Guayaquil, Ecuador.
© Flickr/Dave Lonsdale

A month after its approval by the municipal authorities in December 1996, the private non-profit organisation Fundación Malecón 2000 was established to lead, manage and maintain the revitalisation project. Chaired by the mayor and consisting of members from public and private institutions and civil society, the Foundation obtained large operational power due to the commitment of the mayor to reduce legal and economic barriers. The ‘Image-Objective’ plan aimed to reconnect the citizens with the river Guayas by advancing the recreational use of the waterfront. Ultimately, the Malecón’s redevelopment would also further catalyse public and private sector initiatives towards renovation of the broader city centre and its surroundings²¹.

As the plan was to be executed with few city funds and during a profound economic and financial crisis that had been affecting Ecuador since 1997, the Foundation adopted an innovative ‘self-funding’ structure. Apart from capturing tax concessions for commercial and recreational actions, the city government passed a law enabling citizen donations and grants towards the project to be income tax deductible by up to 25% between 1997 and 2002. Donations were guaranteed to be spent entirely on construction, creating an exceptional belief in and support for the project – nearly 50,000 citizens participated in the financing scheme. The numerous donations demonstrated citizens were regaining trust in the capacity of local government to positively transform the city²².

For citizens to use the new spaces as early as possible, redevelopment was conducted and finalised in three stages. The first sector – the central part of the Malecón – opened in 1999, while the last part was inaugurated early 2002. The master plan of the redevelopment included the renovation of existing monuments, the transformation of the South Market into a modern exhibition centre, the construction of a new anthropological museum, spaces for commercial activity and new green spaces, and the establishment of an elaborate waste management system.

The project successfully revitalised the connection between the city and its waterfront, and moreover accomplished the promotion of Ecuadorian culture

as well as fostering employment and local economic development – over 4,000 jobs were created to cater for the 20 million Guayaquileños and tourists visiting the Malecón annually. Moreover, environmental degradation was improved by 1) solving traffic congestion and parking issues, 2) multiplying the average green area per person by five, 3) equipping the promenade and its surroundings with waste disposal infrastructure, and 4) decontaminating the Guayas river. Finally, the city centre’s multi-functional use – commercial, tertiary and residential – was revitalised, attracting Guayaquileños, Ecuadorians and foreigners to relocate and re-densify the core.

The project successfully revitalised the connection between the city and its waterfront, and moreover accomplished the promotion of Ecuadorian culture as well as fostering employment and local economic development.

With a final cost of USD 100 million and a timespan of just 5 years, the ‘Image-Objective’ plan was considered a success in part owing to the Fundación Malecón 2000’s operational and financial management structures, which allowed for cost-effective and efficient implementation. Apart from city-wide popular support, the Malecón Simon Bolívar model also received international attention, with the United Nations Development Programme (UNDP) awarding the model in 2003 a best local development and good governance prize²³.

From challenges to opportunities

The success of the Malecón model led the city government – under continued political stability with its new mayor, Jaime Nebot – to replicate the model as soon as the Fundación Malecón 2000's duties concluded in early 2002. Nebot started and chaired a new Foundation, the Fundación Guayaquil Siglo XXI, which once more joined public, private and civil society actors under the same umbrella. The new body was tasked to continue the regeneration process with popular funding, in areas surrounding the city's core. Among the Foundation's achievements are the renovation of the Santa Ana Hill stair corridor along with the redevelopment of its neighbouring resident-run cafés, restaurants, handicraft shops etc.; the regeneration of the Las Peñas neighbourhood; and the revival of the Malecón del Estero Salado – another recreational resort that had been abandoned due to water contamination.

For such an approach to be successful, it needed to be characterised by strong leadership, multi-actor participation – embodied by its operational management structure – and an inclusive, multi-sectoral approach.

Much like the Malecón model, these projects were accompanied by improvements to public services as better sewage networks were installed, water supply and garbage collection management were privatised, and a new transport system – the Metrovia – was erected²⁴. The new mayor adopted an even broader definition of regeneration which went beyond the physical environment to include educational and social programmes to support low-income families. Lastly, the Nebot administration oversaw the regeneration of the Puerto Santa Ana. This project, however, did not align with the ideology behind the previous plans as only 20% of open space was publicly accessible and the other 80% was exclusively directed at high-income groups.

The redevelopment of the Malecón Simon Bolívar fulfilled its underlying goal of initiating a cycle of urban regeneration projects, first in the centre and, later, throughout the entire city of Guayaquil. The undeniable shift in mentality allowed for a move from an inefficient administration and general disregard for the urban environment, to a sense of pride and care for the city, grounded in a holistic understanding of the urban system as interconnected. By improving governance and starting a beautification of the built environment, mayor Febres-Cordero simultaneously addressed the root cause of the city centre's deterioration, namely the loss of its multifunctional use. With the Malecón project he re-established the waterfront as an economically, culturally and residentially attractive space, and motivated Guayaquileños to once again settle and even invest in the city centre. He understood that for such an approach to be successful, it needed to be characterised by strong leadership, multi-actor participation – embodied by its operational management structure – and an inclusive, multi-sectoral approach. Thus, the established governance system simultaneously improved several of the city's sectors – economy, environment, basic infrastructure, and public services provision – as well as their accessibility to all Guayaquileños.

The city of Guayaquil did not explicitly name the concept of resilience in its strategies, however the local government's crosscutting approach to urban management enhanced citizens' economic, social and environmental resilience and thus the city's resilience in general. It is, therefore, not surprising that the model has been applied in several other cities in Ecuador as a model of urban resilience for rapidly urbanising cities in Latin America dealing with urban decay.



Rehabilitation of housing in Las Peñas hill in Guayaquil, Ecuador.
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5.4 JOHANNESBURG, SOUTH AFRICA



Context and challenges

Driving the economic performance of the Gauteng province – which alone contributes to 33% (R674.9 billion²⁵) of the national GDP – Johannesburg’s metropolitan area stands as the centrepiece of South Africa’s economy, as well as an undisputable magnet for the whole Sub-Saharan region. With a 3.8 million population – and growing at a pace of 3.16% per year – the city is also the biggest urban centre of the country, the 40th most populous urban area in the world and the largest to not be situated on a river, a lake or a coastline²⁶. Yet, these economic and demographic figures – which remain unparalleled across the whole African continent – are coterminous with both great challenges and opportunities. In its transition from a racially-divided city – with a mining-centred economy – to a more cosmopolitan metropolis, Johannesburg must address changing socio-economic and environmental patterns.

In its transition from a racially-divided city to a more cosmopolitan metropolis, Johannesburg must address changing socio-economic and environmental patterns.

Johannesburg’s economic foundations lay in the mining sector. Gold was discovered in 1886 in the Gauteng – which is believed to have contributed to 40% of the global production – and remained at the very core of the city’s economic functioning until nearly the 1970s, working as a major engine for the city’s growth²⁷. The scale of the mining activities that Johannesburg, and the broader Gauteng area, experienced since the late 19th century onwards was unparalleled. Consequently, although the former ‘City of Gold’ successfully managed to diversify its economic base, and therefore to cushion the impacts of a rapidly declining mining sector, roughly a century of intensive extractive activities generated a challenging spatial and environmental context.



MAP 5.5: Johannesburg, South Africa.

Although the former ‘City of Gold’ successfully managed to diversify its economic base, and therefore to cushion the impacts of a rapidly declining mining sector, roughly a century of intensive extractive activities generated a challenging spatial and environmental context.

Continual extraction of gold – and waste products generated by increasingly deeper mining operations – resulted in a scarred and splintered cityscape, with large piles of mine waste and slime dams²⁸. Not only do these urban blank spots now constitute portions of uninhabitable land, difficult to spatially integrate in the city, but they also overlap with other layers of discontinuity and social segregation produced by half-a-century of Apartheid planning and by a massive – and largely unregulated – process of urbanisation. In addition, gold extraction has proved particularly harmful for Johannesburg’s natural ecosystems, especially its drinking water.

From a socio-spatial standpoint, the Apartheid system (1948-94) was inherently responsible for the generation of ethnic exclusion through its spatial policies. Inequality was actively produced and maintained both in the form of racially segregated neighbourhoods and of separate public transport networks for white and black commuters. These created physical and psychological lines of exclusion that still persist in Johannesburg’s physical structure today, as well as in the patterns of spatial and economic participation to the city’s urban life²⁹.

Johannesburg’s increasing economic attractiveness – especially since the end of the Apartheid system onwards and with the emergence of a service-oriented economy – has been resulting in rapid and unplanned urbanisation, every month attracting thousands of new residents to its urban area. While a tiny percentage of these people are highly skilled professionals, mainly absorbed by the city’s vibrant tertiary sector, the majority stems from an unabated inward movement of rural migrants, who often settle in the city’s large informal settlements. These areas are often affected by widespread unemployment, income inequality and limited access to public services and it is estimated that almost 18.8% of Johannesburg’s households currently live and work in these conditions of spatial or economic informality.

The Joburg 2040 Initiative

The City of Johannesburg has been showing serious determination to acknowledge the social, economic and environmental stresses depicted above, working towards a more sustainable and inclusive city, as well as confronting the local and global challenges that put a strain on its urban ecosystem.

The first Growth and Development Strategy was launched in 2006, with the aim of reshaping the city's future development as a way of turning the challenges posed by migration, climate change, increased capital mobility and resources scarcity into opportunities. The Strategy – which is also well aligned with the five-yearly Integrated Development Plans – differs substantially from spatial plans in the traditional sense, focussing on strategic directions with a multi-sectoral outlook, as well as on long-term goals through medium-term delivery.

The Growth and Development Strategy Joburg 2040 is meant to create a vibrant, equitable African city, strengthened through its diversity; a city that provides real quality of life; a city that provides sustainability for all its citizens; a resilient and adaptive society.

Formulated in 2006 – with a greater emphasis on economic growth and human development – the Strategy was subsequently refined in 2011 to account for the main socio-economic and political changes that occurred in the previous five years, hence giving shape to the *Joburg 2040*. As explained by Johannesburg's Executive Mayor, Mpho Franklyn (Parks) Tau, in his introductory note to the programmatic document, the Growth and Development Strategy *Joburg 2040* is meant to align Johannesburg's challenges with its immense potential, prefiguring a transition to a “vibrant, equitable African city, strengthened through its diversity; a city that provides real quality of life; a city that provides sustainability for all its citizens; a resilient and adaptive society.”³⁰

From challenges to opportunities

Nine main areas of activity were selected for *Joburg 2040*, which transversally deal with the aforementioned urban challenges and position Johannesburg in the globally transforming environmental and socio-economic patterns. These areas are: population dynamics, poverty and health, economic growth, resource sustainability, environment, transport, liveable communities, community safety, and smart city and governance. Owing to its tight coordination with the five-year Integrated Development Plan, the Growth and Development Strategy is well positioned to achieve its 2040 goals in matters of good governance, economic growth, human and social development, and

environment and services; pursuing the broader aim of enhancing Johannesburg's liveability, sustainability and resilience. Consistent with the clusters exposed above, the Strategy is intended to reach four main outcomes: 1) Improved quality of life and development-driven resilience for all, 2) A resilient, liveable, sustainable urban environment – underpinned by infrastructure supportive of a low-carbon economy, 3) An inclusive, job-intensive, resilient and competitive economy, and 4) A leading metropolitan government that proactively contributes to a sustainable, socially inclusive, locally integrated and globally competitive Growth and Development Strategy.



Gandhi Square in Johannesburg, South Africa.
© Flickr/South African Tourism

Along with the broader objective of improving metropolitan governance performance (Outcome 4) – particularly in terms of accountability, increased people participation and sound financial administration – the Strategy puts greater emphasis on liveability, equity and inclusion, both in spatial and socio-economic terms. Although the city has moved away from its past of segregation, the Apartheid’s spatial legacy still overlaps with larger areas of informality, making social exclusion an urgent. Consequently, the Growth and Development Strategy (Outcome 1 and 2) predominantly focuses on services supply – water, energy, sanitation and waste – and integrated transport networks, as well as on spatial investment in new areas of growth for better integration and land-use functions.

“The strategy is about the ability to mobilise business, communities and labour to be part of a broad coalition of people that are working towards a common objective of achieving a better city and a better Johannesburg for all.”

*– Mpho Franklyn (Parks) Tau,
former Executive Mayor of
Johannesburg*

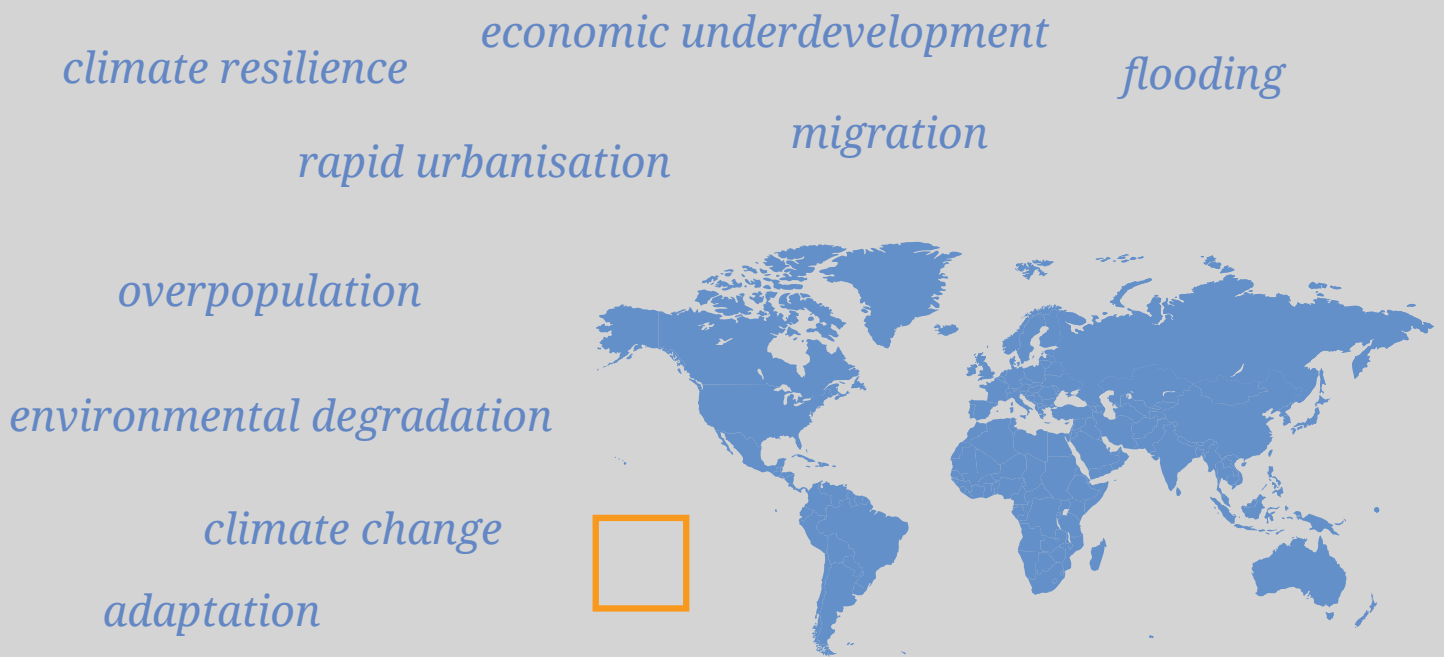
The issue of informality will be tackled with an incremental and diversified approach, acknowledging the critical role that informal settlements and economies currently play in the city and moving towards strategies of gradual upgrading and regularisation. Urban informality is then acknowledged as a controversial yet crucial part of the urban ecosystem: one that plays an essential role in sustainable livelihood creation, but that equally requires incentives and partnerships to be fully capitalised.

Accordingly, *Joburg 2040* Growth and Development Strategy will be proactively committed to fostering local small scale clusters of entrepreneurship, as well as to enhancing a positive correlation between economic growth and job creation. Not only will these measures make Johannesburg’s socio-spatial landscape more integrated and inclusive, but they will also set the case for greater environmental and economic sustainability; particularly concerning transport, renewable energies and sustainable urban environments³¹. Moreover C40 Cities Climate Leadership Group awarded Johannesburg in 2015 – as one of 10 worldwide leader cities demonstrating climate action leadership – for the category of Finance and Economic Development regarding the Green Bond Initiative³², a financial instrument geared to sponsor environmentally sound urban projects.

The *Joburg 2040* Growth and Development Strategy benefits from both extensive bottom-up contributions – resulting from a multi-stakeholders outreach process at the community level – and a solid coordination with other parallel urban strategies currently in force, notably the Integrated Transport Plan, the 2040 Spatial Plan, the 2040 Sustainable Human Settlements Plan and national visions of space and mobility. As stated by the city’s Executive Mayor at the Strategy’s launch event: “[the strategy is] about the ability to mobilise business, communities and labour to be part of a broad coalition of people that are working towards a common objective of achieving a better city and a better Johannesburg for all.”³³



5.5 KIRIBATI ISLANDS



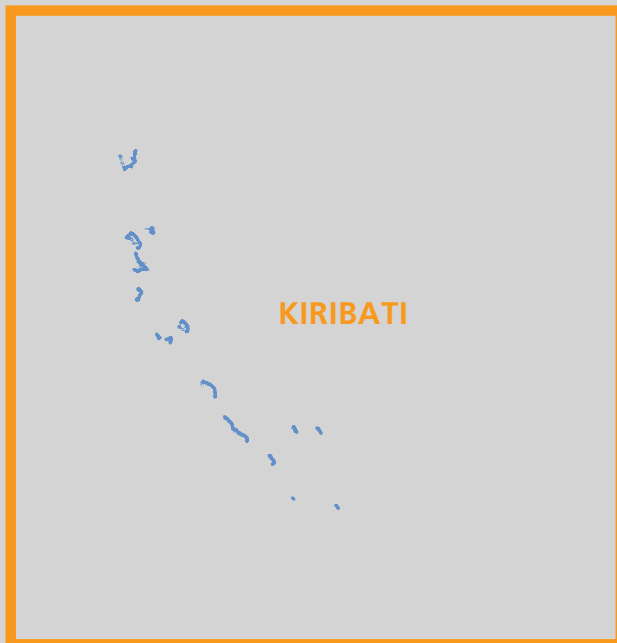
Context and challenges

With 33 islands – of which 21 are permanently inhabited – and an altitude not exceeding 4m above sea level, Kiribati is one of few nations around the world already experiencing the consequences of climate change in terms of gradual sea level rise and increased wave heights. A 2000 World Bank study indicated that around half of the highly populated areas of the Kiribati islands will become permanently inundated by 2050, and without action the nation may disappear altogether³⁴.

Designated both a small island developing state and a least developed country, Kiribati's local and national governments have limited resources to tackle current and prepare for future climate change impacts. Merely 30% of the approximately 100,000 i-Kiribati are employed in financially remunerated activities – mainly fishing and processing industries, and small retail enterprises – whilst the rest of the population lead a subsistence lifestyle. Consequently, the national government's revenues are limited to income from the sale of fishing licences, seafarers' allowances, the export of fish and copra (dried coconut meat), and tourism. It therefore greatly depends on fragmented international development assistance³⁵.

Aside from poor economic development prospects, the Kiribati national government is dealing with rapid urbanisation of the South Tarawa capital island. Growing internal migration for employment, educational and health motives, as well as an annual birth rate of 2.26% brought the population number to surpass 50,000 people – or half of the total nation's residents – in 2011. The majority of residents live in densely packed developments on South-Tarawa's (coastal) surface stretching no more than 450m wide and extending 2m above sea level.

The combination of overcrowding and a rising sea generates water shortages, food scarcity, and an easier spread of diseases due to far-reaching environmental degradation.



MAP 5.6: Kiribati Islands.

With 33 islands – of which 21 are permanently inhabited – and an altitude not exceeding 4m above sea level, Kiribati is one of few nations around the world already experiencing the consequences of climate change in terms of gradual sea level rise and increased wave heights.

The combination of overcrowding and a rising sea generates water shortages, food scarcity, and an easier spread of diseases due to far-reaching environmental degradation. Subsistence crops produce reduced yields because of contaminated ground- and fresh- water reserves from poor waste disposal, and salinisation from saltwater intrusion. Fish stocks are decreasing due to coral reef bleaching from coast line pollution and overfishing, and coastal erosion is taking place due to tree and sand removal for development. These issues will be exacerbated by climatic change factors such as altering rainfall patterns, ocean acidification, increasingly frequent and intense droughts, higher and more frequent storm surges from cyclones, and rising annual air and sea temperatures.

Kiribati Adaptation Programme

Despite its limited economic resources and pressing issues of overpopulation, economic underdevelopment and environmental degradation, the Kiribati government committed, as of 2003, to establish a long-term climate change adaptation policy reconciling both a reactive and proactive approach. First, the Kiribati Ministry of Climate developed in-country adaptation measures outlined in the Kiribati Adaptation Programme, whilst also addressing the nation's eventual inundation – recognising worldwide climate change mitigation will come too late for its inhabitants.

Set up with an initial USD 5 million granted by the World Bank, the Programme consisted of 3 phases spread over a period of 13 years ending in 2016³⁶. During the initial phase, representatives of all inhabited atolls convened to discuss the climatic changes they had been experiencing over the past 20 to 40 years, and to collaboratively prioritise areas of intervention. The most urgent issues were to be tackled in the 2007 National Adaptation Programme of Action which focused on implementing short-term actions. Other climate changes issues were planned to be studied in more detail during the second phase of the Kiribati Adaptation Programme³⁷.

The first phase ensured the mainstreaming of adaptation efforts into national economic budget planning. This allowed for the implementation of climate risk awareness programmes as well as cost-effective, infrastructural adaptation measures during the second phase. These measures concerned mainly smaller interventions, such as mangrove planting and natural seawalls, aimed at protecting the – often inhabited – coastline from climate impacts. Said measures were continued during the third phase and complemented by actions such as waste reduction and diminished fresh water loss from pipeline leakage. More significant however was the adoption of a more forward-looking, integrative governance approach toward the improvement of internal and external water management and the development of a national coastal management policy³⁸.

Key throughout all the phases and initiatives of the Kiribati Adaptation Programme was the adoption of nature-based solutions that require few resources to

implement, thus showcasing how governments with limited – and mostly external – funds may achieve results³⁹. The Kiribati government chose to concentrate most of its interventions on the island of South Tarawa as a way of (cost-)efficiently safeguarding the majority of the Kiribati population. The Kiribati Adaptation Programme remained reactive inasmuch as it addressed environmental degradation from already occurring climate change impacts. Yet, it also proactively prepared the nation for future intensification of these events, to guarantee that i-Kiribati can remain on the islands in safe and equipped settlements for as long as possible. The forward-looking and far-reaching attitude of the Kiribati national government is even more apparent when looking at its approach to last-resort ‘migration as adaptation’.



Contaminated fresh water reserve in Kiribati.
© Dan Lewis

A dignified migration?

The migration as adaptation concept dwells on the knowledge that climate change mitigation will come too late for the Kiribati islands. In-country adaptation measures may enable residents to remain longer, but the islands will become uninhabitable due to rising tides and increasingly frequent extreme events long before becoming permanently inundated. Internal migration suggests only a temporary fix, as relocating inland is difficult because of the islands' narrow and low-lying nature.

It proactively prepared the nation for future intensification of these events, to guarantee that i-Kiribati can remain on the islands in safe and equipped settlements for as long as possible.

This context compelled the Kiribati government to look for a longer-term, more sustainable solution that would enable the i-Kiribati to present themselves as climate migrants rather than climate refugees. The government developed the 'migration with dignity' idea, which aims to facilitate gradual, free-choice emigration of the Kiribati people as well as their integration in receiving countries, to avoid mass migration in the coming decades. To achieve this, the national government imagines the harmonious establishment in foreign countries of Kiribati communities that can support future i-Kiribati migrants with financing and administration, and can ease cultural adaptation and integration.

The idea is incorporated in the national labour migration policy by firstly making the Kiribati inhabitants more attractive to new foreign employment markets. Through enhanced education and vocational training opportunities, i-Kiribati are upskilled to fill gaps and occupations that are in demand, and become more aware of customs of future home countries. Secondly, the Kiribati government has set up short- and long-term agreements with Australia and New Zealand, such as the Seasonal Work Programme and the Pacific

Access Category, to create overseas employment opportunities⁴⁰. Overall, the labour migration policy aims to raise the standard of living for a growing number of i-Kiribati families by reducing the percentage of people dependent on a subsistence lifestyle. In doing so, it wants to empower people to decide for themselves whether to migrate or not, as well as simultaneously reducing their dependence on a threatened self-reliant food supply⁴¹.

The dignified migration idea is subtly integrated in the Kiribati population management policy, as it aims to stabilise the Kiribati population number at 120,000 residents by 2025 as a way of containing the number of future migrants and potential refugees. To achieve this goal, the policy incorporates social programmes that provide education programmes on family planning to generate a transition to a smaller family size⁴².

The Kiribati islands' remoteness implies travelling a distance of at least a few thousand kilometres in case of international relocation. In 2014, in an attempt to secure one of their nearest, most sustainable emigration options, the nation of Kiribati bought a 20 km² piece of land from the Fiji government on Vanua Levu island. The land will be used to gradually and permanently relocate approximately 5,000 i-Kiribati who will cultivate crops on it to alleviate Kiribati's food scarcity. If in the future *en masse* refuge seeking becomes inevitable, it could provide shelter to all of Kiribati's residents if an agreement can be made with the Fiji government in this regard⁴³.

The 'migration with dignity' concept proposes a long-term vision coupled with an innovative and integrative approach to climate change adaptation and the prospect of the Kiribati islands becoming the next Atlantis.

The ‘migration with dignity’ concept proposes a long-term vision coupled with an innovative and integrative approach to climate change adaptation and the prospect of the Kiribati islands becoming the next Atlantis. Efforts not only address economic and cultural obstacles encountered by emigrants, but simultaneously tackle social, economic and environmental issues on Kiribati itself, such as the dependence on a threatened subsistence economy, rapid population growth, and food scarcity due to environmental degradation⁴⁴.

Nevertheless, whilst considered a small island and least developed state, the Kiribati government showcases exemplar willpower to do more with less.

From challenges to opportunities

The connection between climate change and urbanisation is gradually making the Kiribati nation uninhabitable and already i-Kiribati’s lives are threatened as the impacts of these interlinked processes grow more and more apparent. Food and drinking water scarcity, spread of diseases, destruction of property through flooding, are just a few of the challenges the i-Kiribati encounter regularly. Nevertheless, whilst considered a small island and least developed state, the Kiribati government showcases exemplar willpower to do more with less. With funding from several international organisations, the adaptation policy addresses consequences on both the short and long term and considers the question of a final remedy if all else fails. Remarkably, the two-fold policy does not solely focus on infrastructural adaptation to climate change events, but moreover, takes on a forward-looking approach, generating adaptation measures which simultaneously engage with additional issues impairing Kiribati’s progress, such as limited economic development, low education rate, urban sprawl, amongst others.

Thus, even though the Kiribati government does not mention the term ‘resilience’, its holistic policies showcase an understanding of the city of Tarawa and the country in general as a complex interconnection between sectors and scales. The integrative efforts in adapting as well as enabling migration attempt to alleviate both root causes as well as symptoms of environmental degradation and climate change in those areas within the government’s reach such as population, and fresh- and sea- water management. In doing so, the Kiribati government simultaneously enhances its citizens’ resilience in several domains – environmental, social and economic – and tentatively demonstrates how small island developing states and even least developed countries may improve their resilience, without having extensive means.



Aerial view of the Kiribati Islands.
© Dan Lewis

5.6 RIACE, ITALY



Context and challenges

Challenged by decades of economic hurdles and inadequate governance, Calabria – the region where Riace is located – and southern Italy in general, have been suffering from substantial demographic decrease and massive out-migration since the beginning of the last century. Primarily, Italy’s socioeconomic North-South divide¹ constituted a major factor to the abandonment of southern rural areas and smaller urban conglomerations, with an increasing number of households migrating firstly to North America – in the early 20th century – and secondly to northern Italy’s industrial hubs, in search of better economic opportunities. This negative demographic trend resulted in a continuous population shrinkage – worsened over the last half a century – and further exodus of economic activities from small urban centres. A recently published report by Legambiente⁴⁵ warned that a third of the country’s villages, mainly in the South, might face a serious threat of abandonment in the near future. Riace’s population, for instance, fell from over 3,000 inhabitants in the 1950s to 1,610 in 2001.

A recently published report warned that a third of Italy’s villages, mainly in the South, might face a serious threat of abandonment in the near future.

This challenging socio-economic context was aggravated by the 2008 financial crisis –with the disruptive effects of increasing economic fragility being particularly evident in Southern European countries, combined with the unexpected pressure from immigration since 2011. While Italy’s southern shores have always offered a landing point for those leaving North Africa by sea, renewed political instabilities touching Sub-Saharan Africa and the broader MENA region after 2011, resulted in a major challenge for socio-economic integration in Southern Europe.

¹ The divide between an advanced, more industrial North, and a less developed South has historically represented a feature of Italy’s socio-economic landscape since the nation’s unification in 1861.



MAP 5.6: Riace, Italy.

The opening of new migration routes across the Mediterranean, matched by a rising terrorist threat and increased socio-economic instability in Europe, were conducive to political scepticism and emergency measures rather than to resilient inclusion and long-term integration.

Although the ‘refugee crisis’ would require deeper analysis at both the national and European political level, the opening of new migration routes across the Mediterranean, matched by a rising terrorist threat and increased socio-economic instability in Europe, were conducive to political scepticism and emergency measures rather than to resilient inclusion and long-term integration.

Riace’s stance can thus fully be captured only in this broader scenario of uncertainty, in which, whilst Italy, and Europe in general, struggle to cope with the challenges posed by immigration, this small Calabrian town has been emerging as a positive exception. Furthermore, its forward-looking mayor, Domenico Lucano, was recently included in Fortune magazine’s top 50s greatest leaders list (2016)⁴⁶, and his policies were described by the EU Commission as of one of Italy’s most successful models of integration⁴⁷.

The ‘Riace model’

Different from analogous initiatives of urban regeneration, the ‘Riace model’ is not defined by a programme, nor created for implementation in coordination with major development actors or agendas. Resilience has therefore never been referenced as a concept by the local administration, but it is, nevertheless, interesting to observe how the forward-looking strategies that the municipality put in place could be fully credited within its framework of reference.

The policy line envisioned by Riace’s local administrators in matters of social inclusion prefigured a substantial shift from reactive to proactive measures, which in the Italian reception system could be explained as a transition from emergency shelter to integration. As explained in a Medecins Sans Frontieres situation report from June 2016, although European countries are still only accepting a relatively small share of displaced people – compared to other world regions – Italy’s reception system remains unprepared and predominantly anchored in emergency logics, often unable to comply fully with minimum humanitarian standards⁴⁸.

As migrants reach the Italian mainland's southern coasts or the island of Lampedusa, they are received either in temporary structures or in Emergency Reception Centres⁴⁹. Although the latter – which often rely on hotels or other hospitality structures – should only represent an exceptional measure in case of extraordinary influx of people, their usage has become increasingly ordinary over the last years. These structures currently account for 80% of the reception places available in the country⁵⁰. Moreover, as outlined in the Dublin Regulation⁵¹, this is also the stage at which newcomers can apply for international protection, exclusively in the country of arrival.

In parallel, the System of Protection for Asylum Seekers and Refugees (SPRAR) provides a secondary reception service, which – differently from the previously described bodies – is meant to provide longer-term assistance to those who are processing their requests for asylum, as well as foster the integration of those who are accepted. For a period of up to six months, and drawing upon both the Common European Asylum System⁵² and the National Fund for Asylum Policies and Services⁵³, the SPRAR emerged out of an agreement on a 'National Asylum Programme', signed in 2001 by a diverse group of local, supra-local and international actors, including the United Nations High Commissioner for Refugees (UNHCR)⁵⁴.

The policy line envisioned by Riace's local administrators in matters of social inclusion prefigured a substantial shift from reactive to proactive measures, which in the Italian reception system could be explained as a transition from emergency shelter to integration.

The essential quality and innovation of the 'Riace model' can be captured through the mayor's motto of 'filling up the void spaces', which implicitly encompasses various facets of resilience thinking, from social inclusion to economic revitalisation and from heritage preservation to community cohesion.

Its activities offer an integrated model of reception spread over time and spanning the national territory, which encourage decentralised intervention and cross-sectoral networks at the local scale, to facilitate collaboration between provinces, municipalities and the civil society. Its commitments range from Italian language courses to child education and from legal assistance to socio-economic integration⁵⁵. As of 2016, local authority project holders totalled 376, of which 339 were municipalities, 29 provinces and 8 unions of municipalities.

Although the SPRAR system represents a first positive attempt to depart from emergency logics, its facilities are often needed to overcome the deficiencies of primary reception centres, thus switching the system's role back to short-term action. Furthermore, given the relatively limited number of places offered by the SPRAR, greater numbers of migrants are forced to look for informal job opportunities. Given the decentralised and ramified character of its intervention, the system is highly dependent on local government policies, and its outcomes are very diverse across the national territory. Riace – one of the first municipalities to join the programme when it was established in 2002 – has been particularly successful in taking advantage of the SPRAR to shape its positive model for integration.

From challenges to opportunities

The essential quality and innovation of the ‘Riace model’ can be captured through the mayor’s motto of ‘filling up the void spaces’, which implicitly encompasses various facets of resilience-thinking, from social inclusion to economic revitalisation and from heritage preservation to community cohesion⁵⁶.

As the extensive exodus of economic activities constituted a major challenge for the city’s shrinking economic figures, the strategy envisioned by local administrators sought to draw on the social and economic capital offered by migrants, in order to reverse – or at least mitigate – a negative population trend. Therein, the urban regeneration process was initiated in Riace by presenting migration as an opportunity – rather than as an external threat – and aligning its positive potential with the socio-economic challenges posed by demographic decline.

Since the first migrant boat reached Riace’s shores in 1998, Domenico Lucano – who at that time was president of the local NGO *Riace Citta Futura (Riace Future City)* – has been proactively and continually committed to fostering the renovation of abandoned houses in the historical medieval centre, turning them into adequate housing facilities for the families of newcomers. While this was possible thanks to a set of publicly coordinated initiatives from the Ministry of Interior – the most durable and ramified of which was the SPRAR system – *Riace Future City* played a critical mediating role between the abandoned properties’ emigrated owners, the local administration and the families of migrants. The path initiated by Domenico Lucano – now in his third mandate as mayor – stimulated the emergence of other satellite civil society organisations, which have been playing a key role for years within the SPRAR programme’s framework.



Family of migrants in Riace, Italy
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Simultaneously, the municipality has also been taking important steps to trigger small-scale economic revitalisation. Small economic activities and five artisanal laboratories based on traditional crafts were opened with public incentives, in order to both ease the newcomers' integration – as they employ diverse teams of migrants and local inhabitants – and to provide local people with reasons to stay. Furthermore, migrants have been granted with a EUR 200 bonus for first-need expenditures, only usable in the city's shops to encourage local trade. Although these measures only contribute to a limited share of the city's economy, they hold a positive role in linking the different sectors and services, fostering community cohesion among newcomers and local people, providing the latter with an incentive to stay, working to revitalise the historical centre and stimulating economic productivity. Eventually, following similar schemes of intervention, Riace's municipality has been participating in other relocation programmes parallel to the SPRAR.

The long-term vision delivered by the municipality set a clear path towards social, economic and cultural resilience, whilst offering a positive case for a cross-sectoral and cooperative framework between the national and local scales.

Given that the SPRAR's support and the funds channelled by local authorities through its networks are temporary, not all the migrants relocated in Riace are able to stay beyond this period. Once the six-month reception phase expires, a high percentage inevitably move out in search of better job opportunities. Although this continuous reshuffle of population poses significant challenges of continuity – especially when it comes to long-term planning – the economic and demographic results achieved by Riace offer a particular exception when compared to both the national landscape and the previously depicted challenges.

Italy is increasingly seen by migrants as a transitory corridor towards the wealthier northern and western European countries such as Sweden and Germany, in this context, the fact that a few migrant families have decided to rebuild their lives in Riace represents a strikingly positive outcome of the city's strategy.

The city of Riace – which had reached a low peak of 1,610 inhabitants in 2001 – now counts a population of 2,238, of which 459 are migrants⁵⁷; its birth rate has started growing again; the local school was prevented from closing; and local youths found new motivations to stay. Although migrants cannot be considered entirely as a part of the permanent population – the municipality has in fact welcomed 6,000 people overall since 1998⁵⁸ – their inclusion in the urban system was of key importance to turn all challenges – internal and external – into opportunities. The long-term vision delivered by the municipality set a clear path towards social, economic and cultural resilience, whilst offering a positive case for a cross-sectoral and cooperative framework between the national and local scales. These visionary policies have not only proved successful in reversing the demographic decline, but – as emerged through a wide array of media reports over the last years – are also more inclusive and considerably less expensive for the State budget than what the primary reception centres prove to be.

The vision expressed in Riace cannot deliver a definitive solution for migrant integration, it does however show how a proactive attitude towards challenges, matched by an integrated understanding of inherent dependencies in urban systems can generate positive results in apparently desperate contexts. Although it cannot escape the socio-economic problems affecting southern Italy, nor the wider migration patterns crossing the nation's borders, the Riace model has positively influenced the neighbouring municipalities as one of the most inclusive regional laws on migration in Italy. As clearly emphasised by the Governor of the Calabria region, Mario Oliverio – during an official visit to the city – the Riace Model not only aims at reception but also at integration, representing a potential asset for those urban centres that suffer from continuous depopulation, as well as encouraging a shift from short-term humanitarian intervention to forward-looking political solutions on immigration.



Overview of Riace, Italy.
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5.7 TOYAMA, JAPAN



Context and challenges

Nestled along the coast of the Japan Sea, Toyama – capital of the Toyama prefecture – is bordered by the Tateyama mountain range on the east and crossed by numerous rivers. This dynamic landscape constitutes both an asset, featuring as a major hydroelectric energy source for the city’s prosperous industries, and a trigger of plausible hazards, mainly floods. Toyama has adapted and built resilience over time through innovative policies and techniques. Following the destructive air raids that targeted the city in 1945, at the end of Second World War, major infrastructure reconstruction and improvements were carried out and the local industrial economy was further enhanced. In this respect, Toyama has rapidly emerged as an economic hub, with industrial activities including manufacturing machinery, precision electronic parts, and recently information technology and environmental protection, as well as a historically well-recognised pharmaceutical industry among the most developed in Japan. Consequently, the city constitutes a major centre of commercial activities in the Sea of Japan region.

Despite these positive economic figures and similarly to other cities in Japan, Toyama is facing serious demographic challenges, mainly ageing population due to low fertility and high life expectancies. The city’s population grew considerably between the years 1950 and 1990, under the impulse of a rapid urbanisation and fast economic growth, however the trend started to dramatically slow down from 1990, resulting in serious demographic shrinking by 2010⁵⁹. The ratio of older people (over 65 years) in Toyama reached 26% in 2013 and this figure is projected to reach 38% by 2040⁶⁰. At the country scale, this was matched by the growing affirmation from the 1970s onwards of a tendency towards small families, mainly explained by high levels of education, women’s increased involvement in labour force, high costs of child raising and education, and inadequate spaces among other factors⁶¹.

A major repercussion of this demographic shift is the shrinking workforce, which leads to downturns in tax revenues, coupled with an increase in public expenditures on social welfare, mainly health services and medicines. As a result, there has been a major concern in Toyama over both the city’s economic



MAP 5.6: Toyama, Japan.

Despite positive economic figures and similarly to other cities in Japan, Toyama is facing serious demographic challenges, mainly ageing population due to low fertility and high life expectancies.

wellbeing and its financial capacity to maintain the current level of services provision to a spatially dispersed residential housing. Toyama's population, as of October 2016, was approximately 418,000 people, with an estimated density of 340 persons per km², making the city the lowest prefectural capital in terms of urban population density⁶².

Toyama's urban form is characterised by low density developments, high coverage of road networks and dispersed land-use patterns. This features as an outcome of the rapid economic growth experienced by many Japanese cities between the 1970s and the 1990s, period during which significant urban sprawl and motorisation projects took place in the country. Subsequently – between the end of the 1980s and the early 2000s – a significant increase in car dependency was matched by a sharp decrease in public transport use. For instance, the percentage of tram and bus users dropped by 43% and 67% respectively, over the period. This had serious consequences on Toyama's environment, with local CO₂ emission doubling the national average between 1990-2003, mainly as a result of increased car ownership and commuting travel⁶³.

Such propensity towards low density and car-oriented developments has been exacerbating the challenges posed by demographic shrinkage, and since almost half of Toyama's elderly population is scattered outside the central areas, government expenditure in social welfare and maintenance of ageing infrastructure is likely to increase. Conversely, since the number of elderly people travelling to the city centre is declining sharply – also due to difficulties in moving independently and easily – the city core is prone to social and economic decay posed by inactivity and lack of vitality.

Toyama has adapted and built resilience over time through innovative policies and techniques.

Compact City Strategy

The economic impacts of ageing population and the environmental consequences of the city's current form, together with the social distresses that these challenges provoke – for instance the increase in unnoticed deaths of single aged people left alone and isolated in the suburbs – led the City of Toyama to consider new perspectives on urban planning. Consistent with the compact city concept mainstreamed at the national scale, policies have been adjusted in order to revise land-use systems, regulate urban sprawl, assemble different city functions within dense urbanised zones and pursue the revitalisation of city centres⁶⁴. On a more detailed level, Toyama has formulated a cross-sectoral strategy in order to integrate transport, urban form, land use, housing and social care at the policy level⁶⁵. This strategy is centred around three core policies addressing public transportation, housing and mixed-use developments, and economic investments.

In order to revitalise its ageing and underused public transportation system, the city plans to invest in a network of well-connected and user-friendly public transport as a means to prompt a change in citizens' lifestyle, particularly elder generation⁶⁶.

The second key policy previewed by Toyama's compact form strategy is the promotion of housing and mixed use developments, along recently developed transit corridors in areas defined as Residential Encouraging Zones (REZ)⁶⁷. These measures seek to encourage citizens – specifically those with no access to private cars – to gradually move to areas that are closer to and better served by public transport.

Finally, since Toyama's central district has started suffering from substantial economic inactivity, the third key principle of the strategy aims to intensify investments in the city centre through which it would retain its economic and financial productivity.



Transport revitalisation in Toyama, Japan.
© Flickr/Happy Come

From challenges to opportunities

Conceived in 2006, Toyama's comprehensive plan for 2007-2016 was centred around urban configuration to improve the mobility of citizens with no access to private vehicles, with a particular focus on the elder strata of the population. The revitalisation of public transport was initiated in March 2003, by developing 6 tram lines and 13 bus routes as vital transit corridors⁶⁸. One of the early steps towards implementation of the plan was taken by transforming the approximately 8 km-long JR Toyamako train line into light rail transit (LRT), with more stops and increased runs per-day. Simultaneously, the municipality committed to improve the existing tram line in the city centre, transforming it into a circular LRT line, in order to increase the connectivity of the central district. Finally, the northern and southern parts of Toyama were further linked through the newly reconstructed Toyama station, connecting the existing north and south tram lines⁶⁹.

The positive outcomes of this policy were testified by the fact that public transport usage has almost doubled in the city, with 10% of users being former car drivers. Most significantly, as of 2014, the percentage of elderly people (over 60 years old) using public transport, more than tripled. On a smaller scale, thanks to the loop tram line – also connected to the rest of the network – the central area is becoming more appealing and easier to move around, while the percentage of vacant shops within this zone started to decrease in 2009, dropping to 2.3% in 2011.

Moreover, for the purpose of agglomerating residences in REZs (Residential Encouraging Zones), areas within 500m from tram stations and 300m from bus stops were defined in the city's comprehensive plan. Those closer to the central district are designated to functions and activities that can enhance the attractiveness of the core – cultural, recreational, and commercial, in addition to residential – while the rest of REZs is earmarked for functions that feed daily life needs such as schools, hospitals and community services⁷⁰.

In its endeavours to stimulate citizens to reside in REZs, the city has been offering financial support to the construction and purchase of apartments in these areas. Consequently, percentage of people living in those defined areas increased from 28% to 31% between 2005 and 2012 and is projected to reach 42% by 2025⁷¹. Special attention is given to encouraging the relocation of elderly residents.

The economic impacts of ageing population and the environmental consequences of the city's current form, together with the social distresses that these challenges provoke led the City of Toyama to consider new perspectives on urban planning, such as the compact city concept.

Similarly, and as a part of Toyama's third policy of reinvigorating the central district, incentives have been offered towards the intensification of projects and initiatives dedicated to enhance the liveability of the city's core. Projects include, amongst others, the construction and improvement of public spaces and cultural activities as well as the transformation of old buildings to offices or housing.

The urban centre's attractiveness was then further enhanced thanks to an integrated pedestrian network, as well as through the creation of more public spaces for recreation. Subsequently, an increase by almost 50% in the percentage of pedestrians moving in the city centre, was recorded from 2006 to 2011⁷². Finally, given the notable decrease in car dependency in Toyama as an outcome of the city's compact form strategy, CO₂ emissions produced by transport is set, according to the city's Eco Model plans, to decrease 30% by 2030⁷³.

The urban regeneration of Toyama is in continuity with the city's long history of unique associations for dealing with challengesⁱ, and could not have been attainable without the distinctive coordination and partnership between the local administration, the central government, the prefectural government, the private sector and citizens⁷⁴. The outcome of this cooperation is the revitalisation of a transport system that is publicly built and privately operated⁷⁵.

The urban regeneration of Toyama is in continuity with the city's long history of unique associations for dealing with challenges, and could not have been attainable without the distinctive coordination and partnership between the local administration, the central government, the prefectural government, the private sector and citizens.

In addition to its urban form transformation strategy, Toyama has engaged in a number of initiatives to deal with the consequences of ageing population, notably the ever-increasing labour shortage. In this respect, the local government has established schools specialised in training current elderly employees for new jobs and skills; while also offering financial support to employers hiring older people for vacant positions. Moreover, the city provides preventive health care centres for strengthening the health and social wellbeing of aged people. In doing so, these centres provide medical check-ups, fitness and social activities.

Although Toyama's strategy did not include any references to urban resilience, its outcomes are aligned with the concept. To this extent, the remarkable high quality of living that elder people enjoy in the city was a major factor leading the Rockefeller Foundation to select Toyama as part of its 100 resilient cities network⁷⁶. Moreover, the pleasant outcomes of the city's strategy in tackling the issue of ageing population and the subsequent reduction in emissions led to further endorsements of this vision through the Japan's Future City Initiative (2011). The latter – of which Toyama is a member city – is concerned with sustainable city management in Japan until 2050. Finally, as of 2012, Toyama along with Melbourne, Vancouver, Paris and Portland were recognised by OECD's report on "Compact City Policies", as advanced cities in this field⁷⁷.

Toyama's compact city strategy showcases a unique approach to dealing with demographic transformations – and population decline in particular – substantiated by a holistic and interdisciplinary understanding of urban environments. The policies adopted by the local administration in terms of transport design and environmental sustainability reveal promising outcome in tackling the socio-economic issues provoked by rapid urbanisation and subsequent urban sprawl, while showing greater awareness of the local context and challenges, as well as an outstanding transformative capacity. In the broader global scenario – in terms of urban development tendencies and policy solutions – the experience of Toyama can provide fruitful insights, both on the resilience challenges caused by sharp demographic shift and on the multi-faceted strategies that can be implemented across sectors, in order to mitigate disruptive trends, and in some cases, ultimately reversing them.

ⁱ For instance, in its attempts to alleviate the impacts of rivers' seasonal floods, Toyama city has engaged the owners of approximately 300 hectares of farms in using rice fields as temporary dams, thereby averting urban floods.



An overview of Toyama, Japan.
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5.8 YAKUTSK, RUSSIAN FEDERATION



Context and challenges

Located just south of the arctic circle, the city of Yakutsk, capital of the Sakha Republic, or Yakutia, constitutes one of the largest settlements in the world built on permafrost, housing about 320,000 inhabitants. Over time, citizens have learnt to adapt to temperatures that can range between -60° Celsius in winter and $+40^{\circ}$ Celsius in summer, and an average annual temperature of -8.8° Celsius. Piles that drive 18m deep into the frozen ground support buildings and infrastructure to ensure stability and systems are modelled to administer heating for a 8-month long cold season⁷⁸.

After Russia's political transition during the early 1990s, the dissolution of the centrally planned economy led to nationwide economic instability. The resulting labour migration from rural areas towards cities led to steady population growth for the city of Yakutsk. Relying mainly on the region's diamond mining and gas production, the capital of Yakutia rapidly recovered from the economic decline and provided migrants with more economic certainty⁷⁹.

The in-migration of ethnic Yakuti remains a major addition to the city's demographic trend. Compared to other cities and rural villages in the Sakha Republic, Yakutsk offers more employment opportunities, better services and a higher quality of living. These factors attract primarily youth from neighbouring areas, bringing the city's growth to an annual rate of 1.56% and lowering its average age to 30.2 years. Over the past decades, planning failed to match the pace of demographic expansion, gradually pushing the city's economic and infrastructural capacity to its limits. Housing is becoming increasingly scarce and rents are rising, while unemployment is often not registered – and therefore hidden – due to societal pressure. Moreover, the growing population is intensifying the city's impact on the surrounding ecosystem, resulting in environmental degradation, with emissions from mounting vehicle usage decreasing air quality and worsening winter ice fog.



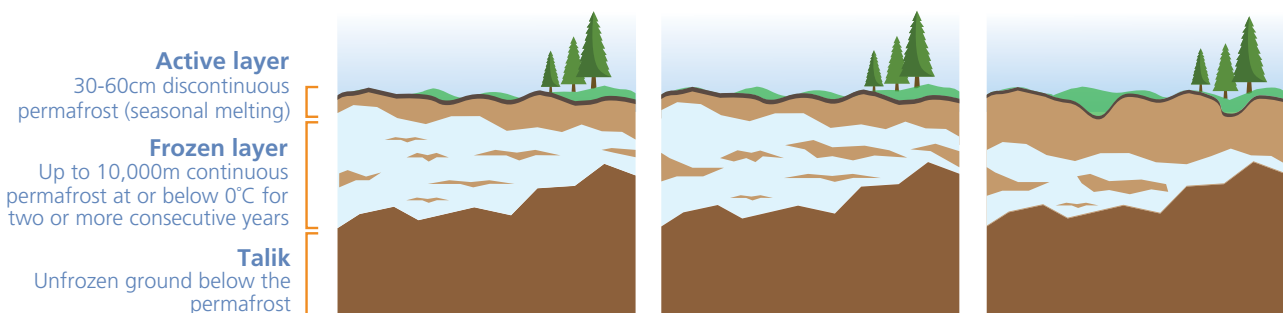
MAP 5.6: Yakutsk, Russian Federation.

Over time, citizens have learnt to adapt to temperatures that can range between -60° Celsius in winter and $+40^{\circ}$ Celsius in summer, and an average annual temperature of -8.8° Celsius.

Meanwhile climate change is also affecting the city. Global warming is causing the 'active' layer of permafrost, usually between 30cm to 60cm thick, to expand beyond 1 meter. The once hard frozen ground underneath – or continuous permafrost – is turning soft, threatening infrastructure with distortion and shortening the lifecycle of buildings. Already,

houses and apartment blocks in Yakutsk are cracking, some were even ruled uninhabitable due to danger of collapse, furthering the housing shortage⁸⁰. Key infrastructure, such as roads, power lines, (waste)water, oil and gas pipelines, and Yakutsk Airport's runways, shows similar damage⁸¹.

FIGURE 5.1: Diagram of Permafrost.



Permafrost is a permanently frozen layer of ground that consists of soil, gravel and sand, bound together by ice. It is made up of two layers of frozen ground, namely discontinuous and continuous permafrost. Discontinuous permafrost refers to the surface layer of frozen ground that is 'active', meaning it annually

melts for several weeks or months during the summer. It is underlain by continuous permafrost, which indicates the sub-surface layer of ground underneath that remains frozen – at or below 0° Celsius – for two or more consecutive years.

Beyond the city, the region's agricultural land as well as its major industries of gas and diamond mining are at risk of ground settlement and thermokarstⁱ. Additionally, prolonged thawing of ice roads and tundra reduces access to these industrial sites, and to transit routes and pipelines for maintenance⁸². Defrosting also exposes waste disposal sites, contaminating both ground water and the nearby river Lena, and produces excess salted icy water, leading to salinisation and flooding of the river during Spring time.

Nearly a decade ago, authorities in Yakutsk first recognised the need to adapt socioeconomic development to the reality of the harsh cold climate,

ⁱ Thermokarst is the thawing of permafrost when warming melts frozen ground, causing the ground supported by permafrost to collapse or subside into the volume previously occupied by ice. Water from melting permafrost or precipitation can collect in these collapse areas, altering hydrology.

whilst avoiding environmental degradation. In doing so, the city simultaneously committed to climate change mitigation, to halt and limit occurring shifts in vegetation and wildlife⁸³. The generated cold climate urban development plan retrofitted buildings to enhance energy efficiency, provided a new drainage system, and constructed better roads as well as 5,000 new apartment units. Yakutsk was awarded the UN-Habitat Scroll of Honour, which appreciates work in the domain of human settlements development, in 2011 for the implementation of its innovative policy. Ever since, the city has sought to foster its commitment to sustainable urban development and is now looking to become a resilient city⁸⁴.

Yakutsk City 2032

In 2012, current mayor Aysen Nikolaev requested his team to study the basic issues of the city of Yakutsk. Throughout the analysis, the team concluded that, in order to tackle challenges such as housing scarcity, a weakening economic foundation and multiplying environmental impacts, a shift from ad hoc reactions to farther-reaching and longer-term solutions was needed. The 2009 cold climate urban development plan constituted a first attempt to alleviate the consequences of past inadequate planning.

Recognising the identified issues are interdependent, influencing one another and exacerbated by a growing population and permafrost thawing, the team took a more comprehensive approach to the city's development. It devised the Yakutsk City 2032 policy which plans for a projected population of 406,000 people with a very young average age. The policy sets out four priorities: 1) provide comfortable living conditions by managing demographic expansion, healthcare, ecology and the urban environment, and security policy; 2) generate self-realisation opportunities through improving educational and scientific opportunities, cultural development, employment, social security and a youth policy; 3) produce economic growth via promoting industry and entrepreneurship, transport and communication, agriculture, tourism, IT and innovation, and the consumer market and services; and 4) establish an effective municipal property management by drawing up a fiscal policy, an investment and financial policy and a land and property policy.

In order to tackle challenges such as housing scarcity, a weakening economic foundation and multiplying environmental impacts, a shift from ad hoc reactions to farther-reaching and longer-term solutions was needed.

From challenges to opportunities

Since the policy was launched in 2012, Yakutsk has been reducing its environmental impact by diminishing waste disposal landfill and establishing an integrated waste management system. Similarly, it has been improving water treatment, greening the urban fabric, decreasing infill development in the city centre and researching innovative ways to preserve permafrost when constructing infrastructure. Meanwhile, the city has also been active in transforming deteriorated buildings and reducing temporary resettlement by expanding the housing stock, developing smart residential solutions and investing in enterprises dedicated to innovation in construction materials.

The city's government had adopted a positive attitude to approaching its emerging challenges in a holistic way and transforming them into an opportunity to improve residents' lives.

Planning for 2032's expected 406,000 citizens, the Yakutsk local government is broadening its educational opportunities by developing a mostly public governmental education system. The municipality is also investing in infrastructure and technology that can protect the present economic potential from permafrost thawing. In addition, local government aims to increase employment opportunities by diversifying its tertiary economy that is currently focused on the administration of the diamond mining industry. To do so, the city has established a special economic zone to attract new capital and set up an inner-city tech park with venturing financing. Moreover, it has shown an active commitment to renovating and extending the inadequate road network, delivering tourism infrastructure and improving telecommunications infrastructure⁸⁵. The city also aims to foster sustainable agricultural production, in order to lower its dependency on imports from China and others, and further its self-sufficiency.

The local government has been organising various annual cultural activities that celebrate the city's multi-ethnicity seeking to further the strong cohesion between its 124 ethnic groups and promoting the city's and the region's tourist attraction at both the national and international scale. The Yakutsk City 2032 policy was designed to address citizens' demand for an expansion in economic opportunities and the city recognises the importance of actively engaging its residents in governance. As a result, several platforms – both physical and online – were set up to open dialogue with civil society.

Yakutsk demonstrates a positive attitude to building far-reaching sustainable urban development and shows a strong commitment to forward-looking action to enhance its resilience across scales and sectors.

In 2015, the mayor of Yakutsk came to understand how the Yakutsk City 2032 policy and its implementation fit not only within the sustainable urban development framework, but moreover with the urban resilience paradigm. Indeed, the city's government had adopted a positive attitude to approaching its emerging challenges in a holistic way and transforming them into an opportunity to improve residents' lives. Investing in innovative entrepreneurship, infrastructure and technology, it aims to tackle economic and infrastructural strains, all the while reducing environmental impacts, and mitigating and adapting to climate change. The city not only works across sectors, but also across scales. It ensures the participation of all layers of its urban society in decision-making and collaborates with the regional and federal governments to secure financing and guarantee that its local policies fit within their larger-scale strategies.

Engaging in the Barcelona Resilience Week conference in 2016 and through conversations with UN-Habitat's Urban Resilience Programme (URP), the mayor stressed that the capital of the Sakha Republic could advance its urban resilience more. In January 2017, the local government consolidated its close relationship with the URP by formalising the city's participation in the programme. It installed a resilience committee, comprised of senior experts from different departments of the Yakutsk local government, to oversee the city's involvement in the programme and ensure coordination of action. As part of its commitment, it is also responsible for the development of an Arctic/Nordic Cities Resilience Network, through which it will share knowledge with other cities and collaborate on resilience-building efforts.

As the implementation of the Yakutsk City 2032 policy is ongoing, outcomes are being generated and will be evaluated over time. Yakutsk does however demonstrate a positive attitude to building far-reaching sustainable urban development and the municipality shows a strong commitment to forward-looking action to enhance its resilience across scales and sectors. Considering this proactive, inclusive and integrative approach, the city of Yakutsk is a promising example of a resilient city for arctic and northern cities.



Frozen construction site in Yakutsk, Russian Federation.
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NOTES

1. Mohamed Siad Barre was president of Somalia between 1969 and 1991. Following the assassination of the country's second president, Abdirashid Ali Shermake (1969), he seized power through a military coup, instituting a nationalist regime of socialist inspiration, prone to the Soviet Union. His over twenty-year rule ended in 1991, when General Mohamed Farah Aidid took power forcing him into exile. 1991 is also commonly referred to as the starting year of the Somali Civil War.
2. Kälín, W. (2010).
3. Decorte and Temptra (2010).
4. Gupta (2015).
5. Decorte and Temptra (2010): 16.
6. Gupta (2015).
7. UN-Habitat (2016).
8. Padnani (2013).
9. Sugrue (2014).
10. In the 1950s, 214,000 Detroit men worked in blue-collar manufacturing jobs, by 1990 the figure had fallen to only 104,000.
11. Gallagher (2013).
12. S.n. (2013).
13. Detroit Future City (2017b).
14. The Kresge Foundation, the John S. and James L. Knight Foundation and the M.K. Kellogg Foundation are the main ones among others.
15. Detroit Future City (2017b).
16. Detroit Future City (2014a).
17. Detroit Future City (2014b).
18. Detroit Future City (2017a).
19. Delgado (2011).
20. Naranjo Ramos (2014).
21. Fernández-Maldonado and Fernández-Dávila (2007).
22. AIVP (2013).
23. Wilson (s.d.).
24. Navas Perrone (2012).
25. USD 51.8 billion.
26. CDP (2014).
27. Gauteng Department of Agriculture, Environment and Conservation (2008); Visser (2005).
28. Trangos and Bobbins (2015).
29. Beall et al. (2002).
30. Joburg (2011): 3.
31. Joburg (2011).
32. The Green Bond Investment Initiative has raised over R1.458 billion in 2015 alone, financing green projects such as reducing illegal water use through smart meters, promoting separation of waste at source and introducing energy-saving measures such as solar water heaters and insulated ceilings in lower-income neighbourhoods (Johannesburg City Parks and Zoo (2015)).
33. Johannesburg Development Agency (2017).
34. Leckie (2012).
35. Office of Te Beretitenti (2012).
36. The University of the South Pacific (2011).
37. Republic of Kiribati (2007).
38. Ministry of Climate (s.d.).
39. SPREP (2016).
40. Maclellan (2012); Voigt-Graf (2016).
41. Ministry of Labour and Human Resource Development (2014).
42. Office of Te Beretitenti (2013).
43. Caramel (2014).
44. Leckie and Lewis (2010).
45. Legambiente is an Italian NGO committed to environmental and ecosystems preservation.
46. Fortune Magazine (2017).
47. European Commission (2016).
48. Médecins Sans Frontières (2016).
49. While the temporary Accommodation Centres (CDA), the Reception Centres (CPSA) and the Centres for Accommodation of Asylum Seekers (CARA) were created in 1995, 2006 and 2008 respectively, the Emergency Reception Centres (CAS) were established in 2013, in response to the increasing influx of arrivals over sea (AIDA (2017)).
50. SPRAR (2016).
51. The Dublin Regulation – also referred to as the Dublin III Regulation – is a European Union (EU) law that establishes the Member States responsible for the examination of the asylum application. Fully in force since 1997, it constitutes the cornerstone of the Dublin System – established by the Dublin Convention seven years earlier (15 June 1990). The Dublin Regulation defines an array of procedures for the protection of asylum applicants, including those concerning the country responsible for asylum application (European Commission (2017b)).
52. The Common European Asylum System was established in 1999 to harmonise standards of protection across the EU countries. It endeavours to align the EU Member States' asylum legislation, to promote effective practical cooperation and to increase solidarity and sense of responsibility among EU States, as well as between EU and non-EU countries (European Commission (2017a)).
53. The National Fund for Asylum Policies and Services is managed by the Italian Ministry of Interior and included in the Budget legislation.

54. The agreement was signed by local associations and NGOs, by the Italian Ministry of Interior – Department of Immigration and Civil Liberties – by the National Association of Italian Municipalities (ANCI) and by the United Nations High Commissioner for Refugees (Transnational Observatory for Refugees' Resettlement in Europe (2011)).
55. SPRAR (2016).
56. Sasso (2016).
57. UrbiStat (2017).
58. Parker (2016).
59. OECD (2015).
60. PricewaterhouseCoopers (2016b).
61. OECD (2017).
62. PricewaterhouseCoopers (2016b).
63. The World Bank (2011).
64. Kidokoro et al. (2008).
65. OECD (2017).
66. World Cities (2016).
67. *Ibid.*
68. *Ibid.*
69. The World Bank (2011).
70. PricewaterhouseCoopers (2016b).
71. Mori (s.d.).
72. *Ibid.*
73. The World Bank (2011).
74. PricewaterhouseCoopers (2016a).
75. The World Bank (2011).
76. PricewaterhouseCoopers (2016a).
77. OECD (2017).
78. Kesserwan and Arteau (2017).
79. Lewis (2012).
80. Luhn (2016).
81. Climate Change Post (s.d.).
82. Arctic Council (2016); Lien et al. (2013); The World Bank (2008).
83. Jaycen (2014).
84. UN-Habitat (2011).
85. PricewaterhouseCoopers (2015); Lewis (2012).

CONCLUSION AND WAY FORWARD

“The ability of development and philanthropic organisations to work closely with vulnerable communities and groups and implement the lessons of resilience-thinking [...] will determine our success in addressing the critical challenges of the 21st century.”

– Judith Rodin

President of the Rockefeller Foundation, 2005 - 2017
President Emerita of the University of Pennsylvania



A busy street of old town Shanghai, China.
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Originating in ecological systems thinking, the resilience concept has since the 1960s and early 1970s rapidly found its way into various disciplines. With the promise of building capacity to manage the impacts of critical and chronic events, resilience attracted and continues to attract both scholars and practitioners. The concept gained currency in the fields of psychology, engineering, business management and, over decades, in social systems thinking on human settlements. Intertwining with growing interest in urban planning and ‘good’ governance, the momentum for resilience culminated in its uptake into urban governance thinking and global development agendas, coining the term ‘urban resilience’.

As our world becomes increasingly urban, factors like inadequate planning, and asymmetric urban and economic development amplify human exposure and intensify vulnerabilities to hazards. Rapid urbanisation, natural catastrophes or man-made stresses put cities under severe strain if not sufficiently anticipated, and cause destruction of infrastructure and sudden disruptions in services while intensifying latent socio-economic vulnerabilities. Decades of experience in disaster risk reduction and emergency management led to the understanding that the protection of people and assets must go beyond the traditional approach to risk reduction to embrace forward-looking development planning. In the wake of this growing demand to shift operations – in pre- and post-crisis situations – from reducing a city’s exposure to strengthening its capacity, the potential for resilience to couple transitory humanitarian and emergency interventions with longer-planned and integrated sustainable urban development is gaining traction.

Over the past decade, an ever-growing number of actors from the international development sphere have strongly committed to improving urban resilience around the globe. Spearheaded by non-profit and multi-lateral organisations, private companies followed the trend soon after. Moulding the concept to their respective approaches, the diverse stakeholders adopted diverse entry points to the resilience field, with climate change adaptation, disaster risk reduction and community development topping the list.

The adaptability and flexibility of resilience thinking offers an unprecedented opportunity to gather actors from local, regional, national and global scales, the academic, public and private domains, and a range of disciplines on common ground.

The adaptability and flexibility of resilience thinking offers an unprecedented opportunity to gather actors from local, regional, national and global scales, the academic, public and private domains, and a range of disciplines on common ground. Although approaches to resilience progressively branch out, the activities of organisations, corporations, governments and research institutes are weaving together under one umbrella concept. By forging partnerships and alliances for collaboration, and establishing networks and platforms for exchange, actors are nestling themselves in a continuously intertwining community of practice.

Through the pooling of resources, actors collectively develop and implement tools, indices and standards. Measuring the resilience of urban systems, either by sector or in their entirety, is proving increasingly valuable for the identification of capacity gaps. These assessment instruments often cap the sole mapping of risks to reveal opportunities for action and compose the building block of long-term strategies. Forces also join to produce standardised frameworks or guidelines to enhance resilience, with the scope of informing urban governance and policies. Most methods support furthering resilience from an inclusive multi-disciplinary and multi-scale perspective that integrates disaster management and urban development views, to plan for the long term.

Case study research, including those detailed in this paper, confirms that to guarantee protecting people's lives in the short and long run, cities and their partners need to adopt a forward-looking, positive vision that fosters resilience in a comprehensive manner. Investments in creating resilient capacity have limited results if managed per sector, potentially even creating reversed effects on others. Highlighting how pressure on one sector can heavily affect another, the various cases advocate for inclusion and integration of, and effective coordination among, relevant stakeholders from different scales, realms and disciplines.

Mirroring the rising ubiquity of resilience, the plethora of international meetings, conferences and summits on this topic hold the key to shaping future resilience building. Calling on collective action from all stakeholders from numerous domains, the New Urban Agenda confirmed the perception of the city as an interconnected and indivisible system of systems. Similarly, the uptake of urban resilience in the overarching United Nations 2030 Agenda for Sustainable Development – comprising the Sendai Framework for Disaster Risk Reduction, the Sustainable Development Goals, the Paris Agreement, the World Humanitarian Summit Commitments to Action and the New Urban Agenda – consolidated the shared understanding that truly resilient cities move beyond disaster risk reduction, emergency planning or climate change adaptation to encompass sustainable patterns of urban development. For the next twenty years, and possibly beyond, this Agenda will gradually link the humanitarian assistance and international development realms, ensuring an integrative, transformative, forward-looking approach to resilience. Only by collectively adapting such a holistic approach will we turn challenges into opportunities, encourage positive action and truly move towards a better urban future.

Truly resilient cities move beyond disaster risk reduction, emergency planning or climate change adaptation to encompass sustainable patterns of urban development.



Shibuya crossing in Tokyo, Japan.
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CONCLUSION

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Based on the understanding that the whole is greater than the sum of all parts, this first edition of ***Trends in Urban Resilience*** details the approach, methodology and practice of numerous organisations that collectively comprise the whole of urban resilience thinking and efforts today.

This publication starts at the concept's roots and maps the veins and evolution of urban resilience over shifting political and academic climates. Taking stock of the most pertinent actions and approaches, this publication concludes by making a clear case for an Urban Resilience movement that is globally growing in both stature and currency.

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