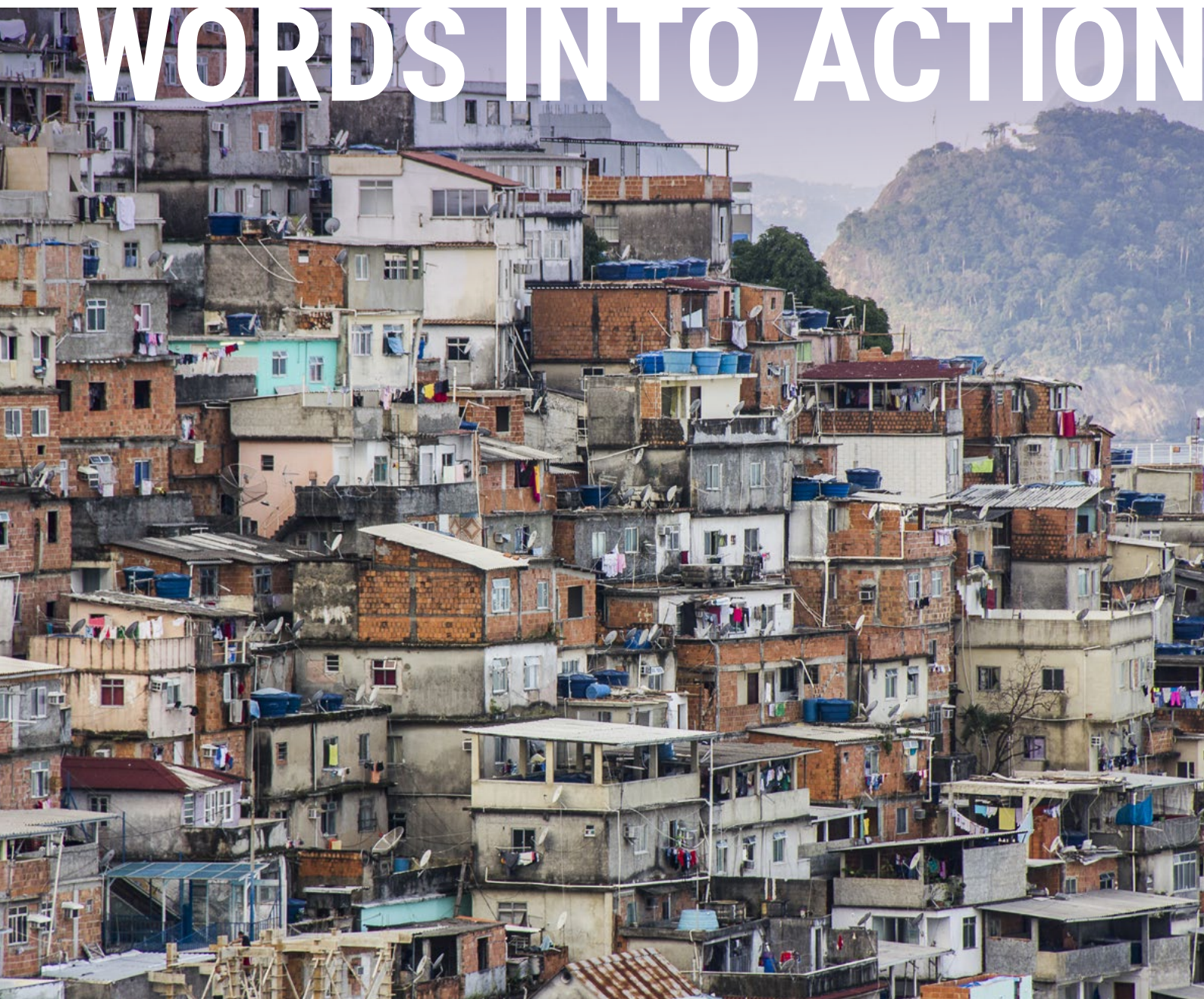


09

  
**SENDAI FRAMEWORK**  
FOR DISASTER RISK REDUCTION 2015-2030

**IMPLEMENTATION GUIDE  
FOR LAND USE AND URBAN PLANNING**

**WORDS INTO ACTION**



# WORDS INTO ACTION

## Engaging for resilience in support of the Sendai Framework for Disaster Risk Reduction 2015-2030

The Words into Action (WiA) guidelines series aims to ensure worldwide access to expertise, communities of practice and networks of DRR practitioners. The guidelines offer specific advice on the steps suggested to implement a feasible and people-centered approach in accordance with the Sendai Framework for Disaster Risk Reduction 2015-2030. These guidelines are not meant to be exhaustive handbooks that cover every detail, and those who need more in-depth information will find references to other sources that can provide them with it.

Using a knowledge co-production methodology, WiA work groups take a participatory approach that ensures wide and representative diversity in sources of know-how. WiA is primarily a knowledge translation product, converting a complex set of concepts and information sources into a simpler and synthesized tool for understanding risk and learning. It is also meant to be a catalyst for engaging partners and other actors.

In summary, the WiA guidelines are pragmatic roadmaps to programming an effective implementation strategy. This is facilitated by promoting a good understanding of the main issues, obstacles, solution-finding strategies, resources and aspects for efficient planning. The guidelines can be a valuable resource for national and local capacity building through workshops and training in academic and professional settings. They can also serve as a reference for policy and technical discussions.

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## IMPLEMENTATION GUIDE FOR LAND USE AND URBAN PLANNING

# WORDS INTO ACTION

A companion for implementing  
the Sendai Framework  
for Disaster Risk Reduction 2015-2030

## ACKNOWLEDGEMENTS

This guide responds to the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) concern that more dedicated action needs to be focused on tackling underlying disaster risk drivers in urban areas through strengthening land use and urban planning. The guide advises those formally and informally involved in urban development and planning, such as local government leaders, mayors, city managers, urban planners, schools of architecture and civil society organizations, on identifying methods and caveats for risk-sensitive planning and development.

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## LIST OF ACRONYMS

<b>AAAA</b>	Addis Ababa Action Agenda
<b>ADB</b>	Asian Development Bank
<b>CBA</b>	Cost-benefit analysis
<b>CBO</b>	Community-based organization
<b>CDS</b>	City development strategies
<b>COP21</b>	21 <sup>st</sup> Conference of the Parties to the UN Framework Convention on Climate Change
<b>DRM</b>	Disaster risk management
<b>DRR</b>	Disaster risk reduction
<b>EIA</b>	Environmental impact assessment
<b>EMI</b>	Earthquake and Megacities Initiative
<b>EWS</b>	Early warning system
<b>GDP</b>	Gross domestic product
<b>HFA</b>	Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters
<b>IFRC</b>	International Federation of Red Cross and Red Crescent Societies
<b>IIED</b>	International Institute for Environment and Development
<b>ISO</b>	International Organization for Standardization
<b>KCCA</b>	Kampala Capital City Authority
<b>MCA</b>	Multi-criteria analysis
<b>M&amp;E</b>	Monitoring and evaluation
<b>NGO</b>	Non-governmental organization
<b>NUA</b>	New Urban Agenda
<b>ODI</b>	Overseas Development Institute
<b>P4A</b>	Partners for Action
<b>SDGs</b>	Sustainable Development Goals
<b>SMART</b>	Storm Water Management Road Tunnel
<b>SME</b>	Small and medium-sized enterprise
<b>SWOT</b>	Strengths, weaknesses, opportunities, threats
<b>UPAG</b>	Urban Planning Advisory Group of UNDRR
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UN-GGIM</b>	United Nations Committee of Experts on Global Geospatial Information Management UN-Habitat United Nations Human Settlements Programme
<b>UN-Habitat</b>	United Nations Human Settlements Programme
<b>UNDRR</b>	United Nations Office for Disaster Risk Reduction (formerly known as UNISDR)
<b>WHS</b>	World Humanitarian Summit

## FOREWORD



Mami Mizutori

Special Representative of the UN Secretary-General  
for Disaster Risk Reduction

More than half of the world's population is now living in urban areas, and the number continues to grow. The rapid increase in urban populations makes it increasingly difficult and challenging for cities and local governments to ensure the safety and well-being of their citizens. Rapid urbanization can lead to unplanned and informal settlements, building in vulnerable locations and leave populations without access to basic public services. These factors increase the cities' and urban populations' vulnerability to the adverse impact of disasters and extreme climate events.

In the past few years alone, we have seen the devastating impact of disasters on cities. In mid-2018, severe floods and cascading landslides inundated the South Indian state of Kerala, causing over 483 casualties, affecting nearly 5.4 million people and leaving an estimated recovery bill of US\$3.5 billion. That same year, wildfires in northern California wiped out the community of Paradise, killed 85 people and destroyed nearly 14,000 homes in November. In July 2019, slum fires in Dhaka, Bangladesh, left 10,000 homeless – making the urban poor even poorer.

Cities are centres of growth and opportunity hubs, and urbanization will continue. How can we ensure that cities are expanding or being built in safe and resilient ways? How can we ensure that people prosper and flourish in an urban environment?

The Sendai Framework for Disaster Risk Reduction 2015-2030, adopted by the United Nations Member States in 2015, was conceived to prevent the creation of new and to reduce existing disaster risk, and losses to lives and livelihoods, economic assets and damage to critical infrastructure. Strengthening people's and communities' resilience, with a focus on those most at-risk, and ensuring risk-informed land use and urban planning is critical for the achievement of this goal.

I am pleased to share with you this Words into Action guideline – **Implementation guide for land use and urban planning** – which demonstrates how to reduce disaster risk through land use and urban development planning. I hope it inspires not only local and national governments alike, the private sector, communities and those engaged in urban development and disaster risk reduction to proactively build and support disaster-resilient cities.

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## ABOUT THE GUIDE

This guide is intended to provide guidance for the urban planning profession and those involved in city development on how to incorporate disaster risk reduction (DRR) and resilience into urban planning decisions and investments to support city governments' resilience objectives and strategies.

It has been written for those actively engaged in urban development and disaster risk reduction. Specifically, this includes: ministries of local government, local government leaders, mayors, city managers and urban planners, as well as schools of architecture, planning and urban development. At the same time, this guide recognizes that planning is not only the function of governmental actors and agencies, executed through formalized systems, but that the private sector and civil society, including community-based organizations, often have a large role to play in shaping cities. The aim, therefore, is to provide these varied actors with broad guidance and up-to-date references in order to mainstream disaster risk reduction and resilience building in their respective activities and roles, including policy formulation, plan-making, setting by-laws and regulations, public service delivery, infrastructure development, community mobilization, teaching, training and capacity building.

The guide unfolds in five chapters. The first chapter sets the scene, explaining key elements of the post-2015 development agenda, particularly the Sendai Framework for Disaster Risk Reduction (Sendai Framework). Chapter two discusses key concepts related to disaster risk reduction, resilience and urban planning, and explores the relationship between them. The third chapter explains how DRR can be integrated into various parts of the urban planning system and throughout the planning cycle. Chapter four addresses the vexed issue of financing, and the fifth and final chapter puts forth some conclusions and caveats.

There are a few elements that make the guide a handy tool for urban practitioners. Definitions of key terms are included in boxes where the terms first appear and recapitulated at the end in the Terminology section. After each substantive section, a set of prompt questions are offered to enable the reader to reflect on the concepts explained and help her/him situate them in her/his own context. These questions are also consolidated at the end of the guide. There are also several case studies, big and small, throughout the guide. More detailed case studies appear in boxes, while shorter ones are integrated within the main body of the text.

In addition, each section has a list of resources and tools for further exploration, with a complete list of references compiled at the end of the guide.

# 01

## THE SENDAI FRAMEWORK AND THE POST-2015 AGENDA



## 1.1 The Sendai Framework for Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is a 15-year voluntary, non-binding agreement that sets a far-reaching, people-centred approach to disaster risk reduction (DRR). It was adopted by UN Member States on 18 March 2015 at the third UN World Conference on Disaster Risk Reduction in Sendai City, Japan. The Sendai Framework applies to risks that are

*“small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or man-made hazards as well as related environmental, technological and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors” (The Sendai Framework, 2015).*

### DISASTER

*“A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic or environmental losses and impacts” (United Nations General Assembly, 2016:13).*

### DISASTER RISK REDUCTION

*“Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development [...] Disaster risk reduction is the policy objective of disaster risk management, and its goals and objectives are defined in disaster risk reduction strategies and plans” (United Nations General Assembly, 2016:16).*

### DISASTER RISK MANAGEMENT

*“The application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses” (United Nations General Assembly, 2016:15).*

The Sendai Framework puts a stronger emphasis on disaster risk management (DRM), rather than on disaster management. It articulates the need to improve understanding of risk and focus on addressing underlying drivers that cause risks. This translates into:

- reducing existing risk,
- preventing future risk, and
- enhancing resilience to risks.

### DISASTER RISK

*“The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity [...] It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors” (United Nations General Assembly, 2016:14).*

### RESILIENCE

*“The ability of a system, community 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 the preservation and restoration of its essential basic structures and functions through risk management” (United Nations General Assembly, 2016:22).*

The Sendai Framework supersedes the Hyogo Framework for Action 2005-2015 (HFA), which set the groundwork for cross-sectoral and multi-stakeholder coordination to reduce disaster risk. Priority 4 of the HFA identified measures that could be incorporated into land use planning to reduce disaster risk. These included the use of disaster risk assessments, mainstreaming disaster risk considerations into infrastructure projects and ensuring that standards, codes and reconstruction practices were fit for purpose and applicable to the local context. However, though the HFA acknowledged the need for addressing underlying risk factors, including those related to planning, there is still much to be done in promoting strategic, participatory urban planning (frameworks, policies and practices) – or “good practices” in planning – that reduces disaster risk (UNISDR, 2015; World Bank, 2012).



**DISASTER RISK ASSESSMENT:**

*“A qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend” (United Nations General Assembly, 2016:15).*

Within the Sendai Framework, urban/ land use planning is highlighted as part of national and local actions to be taken under Priority 3 (Investing in disaster risk reduction for resilience) and, to a lesser degree, under Priority 4 (Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction). As part of the former, it is suggested that national and local-level actions could include mainstreaming of disaster risk assessments into land use policy development and implementation, including the areas of urban planning, land degradation and informal housing, as well as in mapping and management of rural development planning. Furthermore, the importance of getting building codes, standards and (re) construction practices right (whether by revising existing or creating new ones, as necessary), is also emphasized in order to ensure disaster-resistant structures. Under Priority 4, the importance of providing guidance for post-disaster reconstruction is highlighted. This includes guidance on land use planning, including relocation where necessary, and structural standards improvement.

**LAND USE PLANNING:**

*The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long-term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses (UNISDR, 2009).*



## 1.2 Ten Essentials for Making Cities Resilient

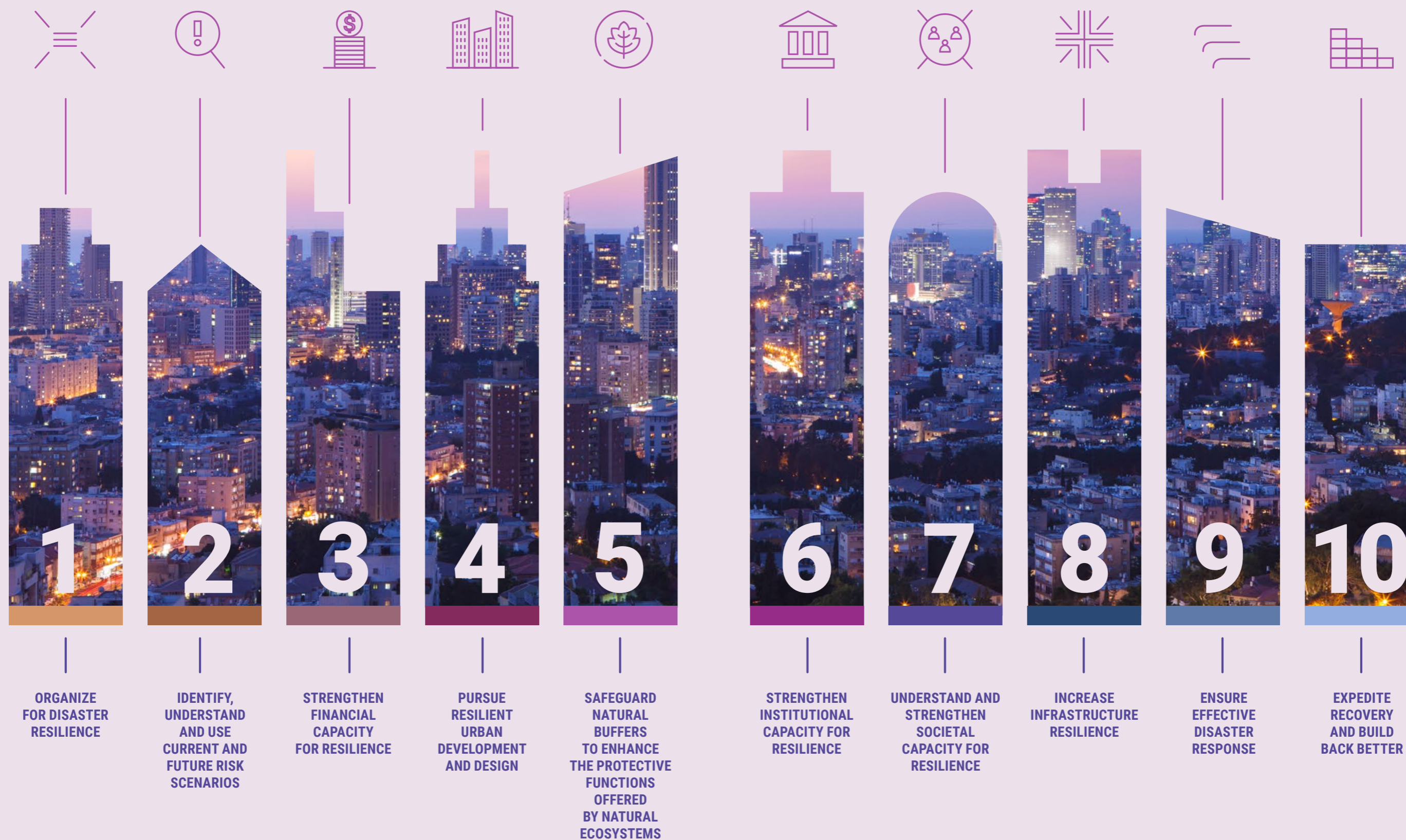
To further the ambitions of the HFA and the Sendai Framework, UNDRR's campaign Making Cities Resilient – My City is Getting Ready! sets out the ‘ten essentials’ that need to happen to make cities resilient.<sup>1</sup> The Ten Essentials for Making Cities Resilient, which were launched in 2010, formed the building blocks for DRR within urban development and were developed in line with the five priorities of the HFA.

The ten essentials (see Box 1 below) were revised in 2015 to align them with the direction of the Sendai Framework and shift the focus from advocacy to implementation. They are operational, adaptive and applicable to all cities and sub-national contexts. They are detailed in Annex 4.

Initiatives such as 100 Resilient Cities (pioneered by the Rockefeller Foundation), ARISE (the Private Sector Alliance for Disaster Resilient Societies led by UNDRR) and standards such as ISO 37120 and ISO 37123 are also helping to foster an understanding of how the Sendai Framework can be implemented by various actors and stakeholders.

<sup>1</sup> <https://www.unisdr.org/campaign/resilientcities/toolkit/article/the-ten-essentials-for-making-cities-resilient>

# The Ten Essentials for Making Cities Resilient



**BOX 1:****The Ten Essentials for Making Cities Resilient: an operational framework for the Sendai Framework at the local level****ESSENTIAL 1:****Organize for disaster resilience**

Put in place an organizational structure and identify the necessary processes to understand and act on reducing exposure, its impact and vulnerability to disasters.

**ESSENTIAL 2:****Identify, understand and use current and future risk scenarios**

City governments should identify and understand their risk, including hazards, exposure and vulnerabilities, and use this knowledge to inform decision making.

**ESSENTIAL 3:****Strengthen financial capacity for resilience**

Understand the economic impact of disasters and the need for investment in resilience. Identify and develop financial mechanisms that can support resilience activities.

**ESSENTIAL 4:****Pursue resilient urban development and design**

The built environment needs to be assessed and made resilient as applicable, informed by risk identified in Essential 2.

**ESSENTIAL 5:****Safeguard natural buffers to enhance the protective functions offered by natural ecosystems**

Identify, protect and monitor critical ecosystems services that confer a disaster resilience benefit.

**ESSENTIAL 6****Strengthen institutional capacity for resilience**

It is important to ensure that all institutions relevant to a city's resilience have the capabilities they need to discharge their roles.

**ESSENTIAL 7****Understand and strengthen societal capacity for resilience**

Ensure understanding and strengthening of societal capacity for resilience. Cultivate an environment for social connectedness which promotes a culture of mutual help through recognition of the role of cultural heritage and education in disaster risk reduction.

**ESSENTIAL 8****Increase infrastructure resilience**

Assess the capacity and adequacy of, as well as linkages between, critical infrastructure systems and upgrade these as necessary, according to risk identified in Essential 2.

**ESSENTIAL 9****Ensure effective disaster response**

Ensure the creation and updating of disaster response plans are informed by risks identified in Essential 2 and communicated to all stakeholders through use of organizational structures as per Essential 1.

**ESSENTIAL 10****Expedite recovery and build back better**

Ensure of sufficient pre-disaster plans, according to risks identified and that after any disaster, the needs of the affected are at the centre of recovery and reconstruction, with their support to design and implement rebuilding.



## 1.3 Linkages to other international agreements

The Sendai Framework forms part of the larger post-2015 development agenda, which includes multiple international commitments and frameworks, as listed below.

- Transforming our World: The 2030 Agenda for Sustainable Development, inclusive of the Sustainable Development Goals (SDGs), adopted at the UN Sustainable Development Summit in New York, United States.
- Addis Ababa Action Agenda (AAAA), adopted at the Third International Conference on Financing for Development in Addis Ababa, Ethiopia.
- Paris Agreement, adopted at the UNFCCC's 21<sup>st</sup> International Conference of Parties (COP21) in Paris, France.
- The Agenda for Humanity, adopted at the World Humanitarian Summit (WHS), held in Istanbul, Turkey.
- New Urban Agenda (NUA), adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III), held in Quito, Ecuador.

The Sendai Framework has substantial linkages to each of these, as illustrated in Figure 1. These linkages promote coherence and present opportunities for more effective action and outcomes across separate but intertwined agendas.

FIGURE 1:

Linkages between the Sendai Framework and other post-2015 commitments and frameworks



## USEFUL LINKS

The Private Sector Alliance for Disaster Resilient Societies (ARISE)  
<http://www.preventionweb.net/arise/>

100 Resilient Cities (Rockefeller Foundation)  
<http://www.100resilientcities.org>

ISO 37120 Sustainable development of communities Indicators for city services and quality of life (2014)  
<https://www.iso.org/standard/62436.html>

ISO 37120 Sustainable cities and communities Indicators for city services and quality of life (2018)  
<https://www.iso.org/standard/68498.html>

ISO 37123 Sustainable cities and communities Indicators for resilient cities (2019)  
<https://www.iso.org/standard/70428.html>

## EXPLORE MORE

Sendai Framework for Disaster Risk Reduction (2015)  
<http://www.unisdr.org/we/coordinate/sendai-framework>

Addis Ababa Action Agenda (2015)  
[www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA\\_Outcome.pdf](http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf)

Paris Agreement on Climate Change (2015)  
[http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)

Transforming our world: the 2030 Agenda for Sustainable Development (2016)  
<https://sustainabledevelopment.un.org/post2015/transformingourworld/publication>

World Humanitarian Summit and the Agenda for Humanity (2016)  
<https://www.agendaforhumanity.org/summit>

New Urban Agenda (2016)  
<http://habitat3.org/the-new-urban-agenda>

## USEFUL TOOLS

Making Cities Resilient Campaign: My city is getting ready  
<https://www.unisdr.org/campaign/resilientcities/>

How to Make Cities More Resilient: A Handbook for Local Government Leaders  
<https://www.unisdr.org/campaign/resilientcities/toolkit/article/a-handbook-for-local-government-leaders-2017-edition>

Making Cities Resilient Report 2012: A global snapshot of how local governments reduce disaster risk  
[http://www.unisdr.org/files/28240\\_rcreport.pdf](http://www.unisdr.org/files/28240_rcreport.pdf)

Making Cities Resilient Report 2019: A snapshot of how local governments progress in reducing disaster risks in alignment with the Sendai Framework for Disaster Risk Reduction  
<https://www.unisdr.org/campaign/resilientcities/toolkit/article/making-cities-resilient-report-2019>

The Ten Essentials for Making Cities Resilient  
<https://www.unisdr.org/campaign/resilientcities/toolkit/article/the-ten-essentials-for-making-cities-resilient>

# 02

## BUILDING DRR AND RESILIENCE THROUGH URBAN PLANNING



## 2.1 Multiple hazards and drivers of urban risk

As urban areas and their populations continue to grow and expand, more people, assets and systems are being exposed to hazards. Unplanned urbanization encourages the growth of slums and informal settlements, exacerbating existing vulnerabilities and contributing significantly to disaster risk in urban areas. Political exclusion and lack of participation of women and other marginalized groups in decision-making means that a diversity of voices is absent or excluded in planning and design.

Further, urban hazards are complex and interlinked. Often hazards such as flooding can trigger secondary hazards such as disease outbreaks, which may have even more severe impacts than the primary hazard; therefore, a multi-hazard approach is necessary in urban areas.

In 2015, annual losses from disasters totalled US\$260 billion. This is expected to rise to US\$414 billion by 2030 (UNISDR, 2015). Trillions of dollars of future investment will be poured into hazard-prone urban areas, mainly because the drivers of urban risk are neither properly understood, nor addressed. Some key drivers are discussed below. Clearly, however, not all are of equal significance, or can be addressed in the same way; for instance, poverty and inequality, as well as climate change, are underlying drivers that need to be addressed through policy interventions at multiple scales. Urban environmental degradation, haphazard urban expansion and poor land management, however, can be effectively addressed through urban policymaking. Weak institutional arrangements, limited capacities and lack of participation in decision-making are also larger governance issues, which can, nonetheless, find local level solutions.

### POVERTY AND INEQUALITY

Poverty and inequality are major determinants of a household's, community's and society's exposure to risks and their ability to cope. Vulnerability, just like poverty and inequality, is differentiated across a city. Typically, women, children, the elderly and marginalized groups are disproportionately at risk due to locational attributes, lack of voice in decision-making and socio-spatial inequalities. When urbanization is unplanned, poorer residents may settle in hazard-prone areas, and their subsequent relocation to "safer" zones, without proper consultation, may in fact make them vulnerable in other ways, by removing important sources of livelihoods and social networks. This can reduce

women's, men's and children's ability to cope with future everyday hazards and disasters.

### CLIMATE CHANGE

Climate change is creating new risks and exacerbating existing ones. This is evidenced by more frequent and intense climatic events, such as floods, cyclones and droughts. 90% of disasters are weather related (UNISDR, 2015). Cities contribute to climate change but also bear the brunt of climate change. Urban planning has a role in both mitigation and adaptation. Climate change can provide leverage to tackle disaster risks more generally.

### ENVIRONMENTAL DEGRADATION

Urban environments and their protection or degradation are also determinants of risk. For example, the destruction of ecosystems and the natural drainage and flood protection they offer can enhance the impact and severity of flooding and landslides. Urban and regional planning can either greatly degrade the environment, or work with it and protect it, by incorporating natural ecosystem services into urban infrastructure and spatial plans and ensuring protection of the environment is reflected in legislation and regulations.

### ENVIRONMENTAL IMPACT ASSESSMENT

*Environmental impact assessment: Process by which the environmental consequences of a proposed project or programme are evaluated and undertaken as an integral part of planning and decision-making processes with a view to limiting or reducing the adverse impacts of the project or programme (UNISDR, 2009).*



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### UNPLANNED URBAN EXPANSION

Data from the Atlas of Urban Expansion (2016) demonstrate that much of the urban expansion over the past few decades has been unplanned and has led to a reduction in urban densities and the growth of urban sprawl. Between 1990 and 2015, there was a 30% increase in land use per capita across 200 of the world's cities, resulting in an expanding ecological footprint, rising energy consumption, reduced environmental sustainability and unequal access to public goods and services, among other impacts ([www.guo.unhabitat.org](http://www.guo.unhabitat.org)). Furthermore, many cities, and settlements within them (both formal and informal), are located in areas of high-risk exposure, typically coastal areas, floodplains, unstable slopes or near hazardous industries (UNISDR, 2015).

### POOR LAND MANAGEMENT/ GOVERNANCE

Land management encompasses "[all] the activities associated with land as a resource to achieve, social, environmental and economic sustainable development. It includes the development and management of utilities and services; the management of land resources such as forestry and soils; the implementation of land use policies; environmental impact assessment and monitoring activities that affect good land use. Land administration is part of the infrastructure that supports good land management" (UN-GGIM, 2015). Poor land management, in relation to all the dimensions mentioned above, can restrict the provision of affordable, serviced land for building, driving large sections of the urban population into illegal and/or informal settlements situated on hazard-prone land. Pro-poor land management, advocated by UN-Habitat, aims to address this by focusing on secure land and property rights for the poor, reflecting local land and property conditions and in support of broad-based socio-economic and political inclusion of the poor. Improved land governance also includes ensuring updated land records and a well-established land information system, mechanisms to resolve disputes, etc.

### POLITICAL EXCLUSION AND LACK OF PARTICIPATION IN DECISION-MAKING

A wide range of actors seek to influence outcomes and the spatial organization of cities and regions. This affects who determines risks, priorities, actions and investments. Typically, access to decision-making processes is unequal and skewed against those living in poverty and suffering from multiple forms of socio-spatial inequality. Gender and intersectionality are often absent or used tokenistically in planning. Participation of local stakeholders should include, among others, women, children, youth, the elderly, people with disabilities, indigenous people, the urban poor, migrants, the private sector, non-governmental organizations (NGOs), community-based organizations (CBOs) and academia. The inclusion of diverse stakeholders in planning processes can enable inclusive planning outcomes that can also support risk reduction through such measures as universal design, ensuring safe public spaces and systematically addressing socio-spatial inequalities with regards to basic infrastructure provision.

### WEAK INSTITUTIONAL ARRANGEMENTS

A lack of decentralization of resources and capacities, as well as unclear or duplicated urban planning mandates, can reduce the effectiveness and ability to act to mitigate risk. In many countries, responsibilities for DRR and those for urban planning rest with entirely different institutions or government departments. There is usually little coordination between departments and tiers of government or across local municipalities. "Disaster management is still seen largely as contingency planning for disaster response rather than a larger perspective on urban resilience" (Johnson, 2011: 16). Vertical and horizontal integration of policies and plans can assist with coordination of objectives, actions, responsibilities and funding streams. Integration can also minimize overlap in mandates and actions and facilitate cost-effective planning.



### LIMITED IMPLEMENTATION AND ENFORCEMENT CAPACITY

In places where there is low capacity to implement, legislation and regulations may not be workable if they are too rigid, arduous, complex and costly for the realities of the local context. The lack of ability to enforce laws and regulations in many cities is an important barrier to effective urban planning. Typically, enforcement of regulations and codes lies with local governments. However, local governments may not always have the resources and capacity required to carry out this responsibility. Decentralization of resources and capacity can go some way to assisting with this function, along with a broader ability to plan at the municipal level. In addition, education and training for developers/builders/contractors on building codes and how these can be met realistically and without further cost impediments should also accompany municipal enforcement activities.

At the same time, however, a flexible, differentiated approach may be required for different types of settlements in order to avoid building codes becoming yet another source of harassment for the urban poor. Several cities have in the past used strict, old-fashioned zoning and building regulations to forcibly evict the poor, thus significantly increasing their vulnerability to crises.

## 2.2 What role does urban planning play in DRR and urban resilience?

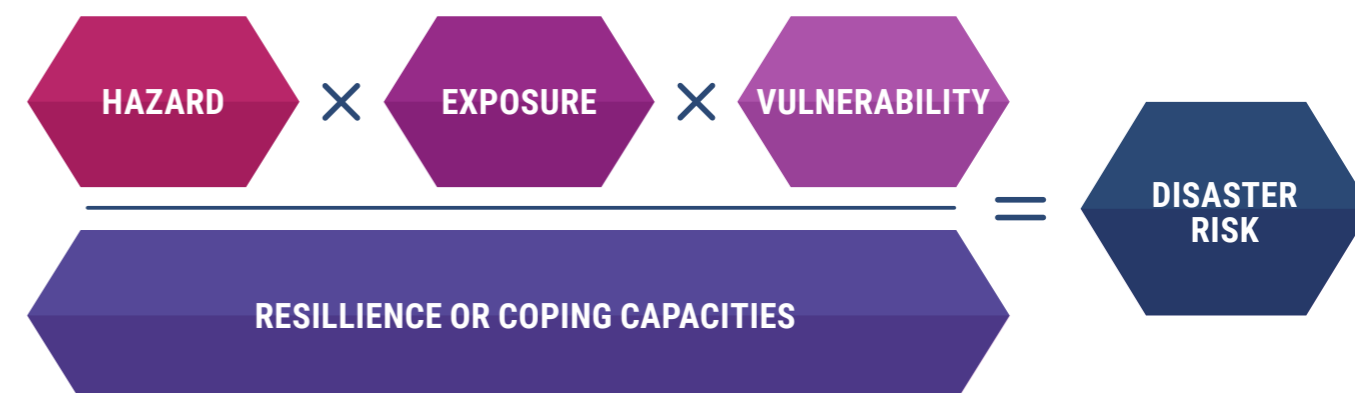
Urban and territorial planning has most been defined as "a decision-making process aimed at realizing economic, social, cultural and environmental goals through the development of spatial visions, strategies and plans and the application of a set of policy principles, tools, institutional and participatory mechanisms and regulatory procedures" (UN-Habitat, 2015a). It should be noted, in particular, that (a) planning is an inherently political process that involves decisions related to allocation of resources to competing priorities, and (b) it is not only a formal activity undertaken by government, but very often is initiated by groups other than formal governments, such as non-governmental and community-based organizations, and sometimes business (Watson, 2009).

Urban planning has an important role to play in reducing current and future disaster risks and building the resilience of city systems, urban residents, businesses and infrastructure. Of all areas that will be urban in 2030, 60 per cent are yet to be built. There is therefore enormous scope for planning to both leverage growth and retrofit existing areas to be more resilient to shocks and stresses. However, current integration of DRR into urban planning is often limited. For cities to be resilient, urban planning and planners need to approach DRR

as a cross-cutting issue pertinent to the heart of good urban development, including urban policy, planning, design and investment decisions. Risk reduction through urban planning needs to integrate DRR into planning, as well as tackling urban growth and poverty and the processes of urbanization that lead to inequalities and increased vulnerabilities. The most cost-effective and sustainable investments in reducing disaster risk are those plans and projects that meet daily needs and reduce poverty (World Bank, 2012).

Disaster risk reduction must also incorporate efforts to build long-term resilience. Notionally, resilience can be seen as the opposite of vulnerability, as the ability of a system to withstand shocks and stresses, to bounce back better or recover from these. Recent discussions also talk about the ability to "bounce forward", or positively transform, as an important element of resilience.

UNDRR's explanation of the relationship between vulnerability, resilience and disaster risk is illustrated below. Definitions of the key terms herein are included in the following box



**HAZARD:**

A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation [...] Hazards may be natural, anthropogenic or socio-natural in origin.

**EXPOSURE:**

The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

**VULNERABILITY:**

“The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.”

(United Nations General Assembly, 2016)



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The practice of urban planning, its intentions, and the actors involved, can positively contribute to reducing risk and enhancing resilience in the following ways:

1. Enable the provision of safe land and secure tenure for the urban poor through participatory processes, including with women, children and those with disabilities, granting incremental legal status to informal settlements, reflecting infrastructural provision in spatial plans, and ensuring that poverty reduction and addressing socio-environmental and spatial inequality are criteria for urban development and infrastructure projects.
2. Facilitate safer settlements through locational and design aspects, including the application of appropriate planning policies, laws, spatial plans and standards and codes.
3. Enhance the inclusion of various stakeholders and voices, through well-designed stakeholder engagement and longer-term relations. In particular, those of the most vulnerable and excluded, including women, children and marginalized groups need to be included in defining risk and priorities and in monitoring responses.
4. Enhance understanding of the spatial, regional and relational aspects of hazards, risks and disaster impact. Planning can do so by utilizing methods embedded in activities such as spatial and regional planning and mesh institutional with spatial approaches through strategic planning.
5. Further climate change mitigation and adaptation, as well as the protection of ecosystems, through use of environmental planning methods, such as blue-green grids and planning that reduces greenhouse gasses (GHG) emissions. Other planning-related measures that can also be of benefit include locational policies, zoning, the mobility and provision of public transport and green building standards.
6. Facilitate linkages between different scales of responsibility, financing and institutional arrangements when addressing risk across sub-municipal, municipal, city-wide and regional levels. Similarly, planning can facilitate linking household and neighbourhood initiatives with municipal and city-wide strategies to strengthen DRR across the board.

7. Work in partnership with communities on upgrading projects to ensure the greatest impact when implemented, including utilizing co-production where applicable.
8. Foster partnerships, such as city-to-city and between city authority and residents, by negotiating competing needs and – ideally – (co-)identifying the objectives of planning.
9. Use existing and create new opportunities for learning and improvement through monitoring and evaluation.

10. Improve and enhance planning systems, bringing in new ideas, resources and ways of working.

The following chapter details how these opportunities for planning to reduce risks can be carried out through integrating DRM into the planning process, including legislative and regulatory frameworks, land use and spatial plans, and urban development and infrastructure projects.

### Questions for reflection

- What are the drivers of urban risk in your city/country?
- How does the urban and land use planning system work in your city/country?
- Is disaster risk reduction addressed as part of urban planning?





## BOX 2:

### Case study – Challenges to reducing risks through planning in Kampala

Kampala, the capital city of Uganda, is an example of a dynamic, fast-growing city in a low-income country. The city has an annual growth rate of 3.7% and demand pressure on land is increasing. Kampala has signed on to be party to the DRR agenda, becoming a member of the UNDRR Making Cities Resilient campaign and implementing a low-emission and climate-resilient strategy, known as the Kampala Climate Change Action strategy.



Kampala (Photos by Alex Macfarlane)



The Kampala Capital City Authority (KCCA) has undertaken a number of disaster risk profiling exercises, which have shown up many challenges. To meet these challenges, the city government has come up with strategies, including how urban planning needs to be improved. With respect to planning, the risk profiling outlined:

- That the city's revenue streams are poor, which limits avenues for investing in required infrastructure.
- There is a weak regulatory framework and land use planning, so KCCA is not able to regulate much of the development that is happening in the city. Additionally, enforcement can often be biased, due to political interference.
- Land use, environmental and other policies are not coordinated with the climate change agenda.
- Going forward, all infrastructure must take into account risks, including those from climate change.
- There is a lack of incentives for the private sector to invest in risk reduction.
- A big challenge resides with some of the basic infrastructure systems. The city does not have proper technology in place for drainage systems, solid waste management and sewerage.

The disaster risk profiling exercises have pinpointed the urban planning-related challenges and now KCCA is working to address these.

Source: UNISDR, 2016 and points elaborated from Kampala representation at Habitat III in Quito, Ecuador, October 2016.



## EXPLORE MORE

EMI Guide to Measuring Urban Risk Resilience: Principles, Tools and Practices of Urban Indicators. <https://emi-megacities.org/?emi-publication=a-guide-to-measuring-urban-risk-resilience-principles-tools-and-practice-of-urban-indicators-2>

ARUP/Rockefeller City Resilience Framework <https://www.rockefellerfoundation.org/report/city-resilience-framework/>

Urban Africa Risk Knowledge <https://www.urbanark.org/>

## USEFUL TOOLS

UN-Habitat International Guidelines on Urban and Territorial Planning. <https://unhabitat.org/project/international-guidelines-on-urban-and-territorial-planning-guidelines-or-igutp>

Risk-based land use guide: Safe use of land based on hazard risk assessment. Geological Survey of Canada (2015) <http://publications.gc.ca/site/eng/9.847514/publication.html>

EMI Risk-Sensitive Land Use Planning Guidebook. [http://emi-megacities.org/wp-content/uploads/2015/01/RSLUP-Guidebook\\_FINAL.pdf](http://emi-megacities.org/wp-content/uploads/2015/01/RSLUP-Guidebook_FINAL.pdf)

# 03

INTEGRATING DRR INTO  
URBAN PLANNING:  
FRAMEWORKS, PLANS,  
PROJECTS AND OTHER  
INTERVENTIONS



FIGURE 2

Key questions for integrating DRR into planning processes

Urban development is closely intertwined with risk. If done well, it can reduce disaster risk; if done without careful consideration, it may exacerbate risk – not just within the boundaries of an “urban settlement”, but also its surrounding region, upstream and downstream. Conversely, reducing disaster risk supports many other planning goals related to sustainable development, poverty reduction, future planning and climate change mitigation and adaptation, reinforcing and future-proofing planning efforts, development goals and investments.

There is, therefore, a compelling case to mainstream DRR into various elements of the urban planning system. Formal urban planning is an iterative, problem-solving system that tends to follow a process of defining problems and identifying current and future needs through the use of data gathering and analysis, identifying and testing options and deciding upon and setting a course of action. It continues with implementation of the plan, project or regulation and monitoring and evaluating to check if the course of action is meeting its goals. Plans are supposed to spatially reflect planning regulations as well as the intentions of different actors and guide the type of development and projects that can occur in specific locations. Yet, in practice, spatial plans are often ignored. Projects, both formal and informal, often take place without reference to spatial plans and may not always abide by regulations.

The following section therefore adopts a broader conception of planning in its relationship to DRR. It explores how DRR can be integrated into legal and regulatory frameworks, different types of urban and territorial plans, urban development and infrastructure projects, as well as other “informal” urban development activities that take place outside the formal realm but are important contributors to the co-production of cities by various actors.

Figure 2 shows how DRR can be integrated into a typical planning process, including key steps of information and knowledge gathering, visioning and prioritization, action planning and implementation, and monitoring and evaluation. These steps may appear together or independently, in different combinations and varying sequences in different contexts. The questions found under different headings will thus be useful in any context and can be adapted, enhanced or elaborated as required.



### 3.1 Legislative and regulatory frameworks

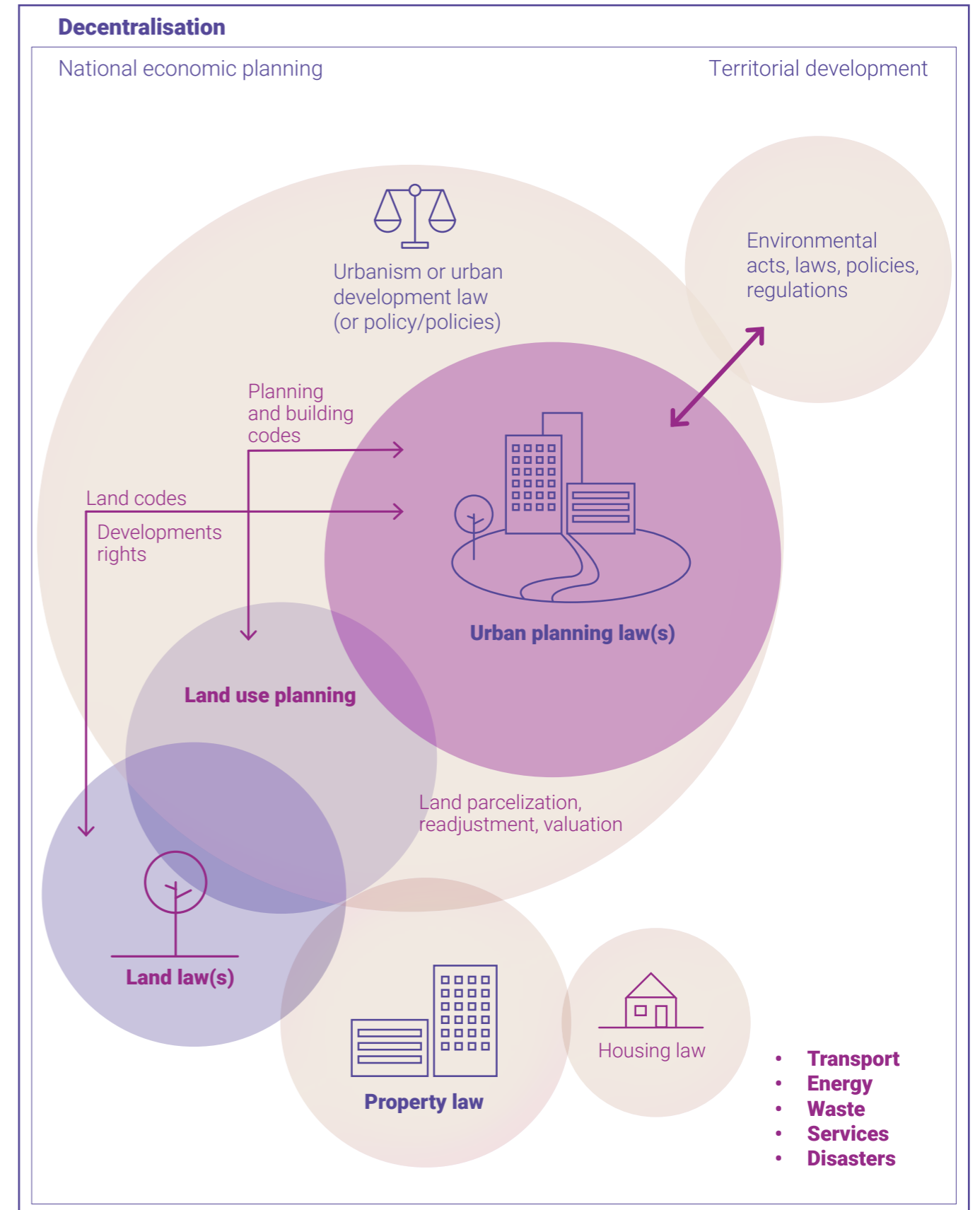
Legislative and regulatory frameworks, when used effectively, can deter settlements (both formal and informal) from hazard-prone lands, enable the provision of safe land and security of tenure and establish risk-reducing design and construction standards. The legislative and regulatory frameworks that control and guide urban development consist of interlinked policies, laws, regulations and other enforcement and guiding instruments, such as codes and standards.

Before describing such frameworks, it is important to keep in mind that planning legislation does not operate in a vacuum, but rather interacts with other laws and regulations, such as those relating to property, the environment, land and housing. It operates, moreover, within an overall frame of decentralization and assignment of powers, responsibilities and resources to various levels of government (see Figure 3). Typically, DRR responsibilities are distributed (often unevenly) between various levels of government. Managing these inter-governmental relations and acting at different scales is thus critical in addressing risks.



FIGURE 3

The web of legislative frameworks around cities



In the context of planning, legal and regulatory frameworks encompass planning policies, legislation, regulations, building codes and standards. The distinctions among these, and their relevance to DRR, is explained below.

*Planning policies* set broad directions for urban development and control and are important for setting the direction of how disaster resilience should be incorporated into the broader planning framework. The delivery of policy intent relies upon the enactment of planning laws that can guide measures to reduce risk.

**PLANNING LAW** relates to the collective laws (national, state/provincial laws and local laws) that govern and are enacted through the making of spatial and land use plans and planning regulations (Berrisford, 2013).

To foster risk reduction, there is a need for a perspective shift with regards to the role of planning law. Legislation needs to become pre-emptive and forward looking rather than reactive, responding to disasters when they occur (Tanner *et al.*, 2015) (see, for example, the Istanbul case study in Box 3 in this section). Planning law needs to focus on incentivizing “getting the basics right” in terms of equitable service delivery. Legislation to enable DRR will also benefit from being less specific in prescribing exact regulations, and instead allow for more flexibility on implementation, in line with local development needs, accessibility and affordability. Less prescriptive legislation does, however, require (a) engagement of multiple stakeholders in its formulation, including representatives of government departments, community-based organizations and civil society, experts and those representing private interests, and; (b) more sophisticated decision-making mechanisms at the project or plan approval stage to determine whether a plan or development does meet legislative requirements (Johnson, 2011).

**PLANNING REGULATIONS** set out specific detailed rules of how a particular requirement of legislation is to be met. Regulations are statutory in their own right and may pertain to urban development, housing, streets, land use and so forth.

*Planning regulations* have a positive role to play in DRR; they can minimize exposure of sensitive uses, such as hospitals, schools, community centres, record-keeping facilities and critical infrastructure through, for instance, ensuring their location in less risky areas. However, planning regulations can also be used to undermine resilience building when they are used to exclude urban development and city-making practices. Good practice in terms of regulation may entail relaxing requirements, such as allowing for smaller plot sizes to ensure that land located near services and employment opportunities is affordable and attainable for the urban poor. Less prescriptive legislation could also mean relying more on design approaches rather than land management in some instances, to make desirable areas safer, while being realistic about development pressures on land.

**STANDARDS** (relating to buildings and the built environment, such as roads and bus stops) cover the physical characteristics, materials, components and buildings and how they will be deemed as satisfactory for use in the given context. They regulate design by specifying such items as room size, distance from adjacent buildings, types of material and construction techniques. Codes and regulations refer to standards.

### **BUILDING CODES (OR BY-LAWS):**

*“A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration and occupancy of structures which are necessary to ensure human safety and welfare, including resistance to collapse and damage” (United Nations General Assembly, 2016:11). This includes both technical and functional standards and must be accompanied by a systematic enforcement regime in order to be effective.*

*Standards and codes* can reduce risk by prescribing restrictions on building types, uses, occupancy, density and high-risk areas. Codes, standards and zoning should be designed to be flexible and respond to local context, especially for informal and marginalized human settlements. They should enable resilience rather than being so restrictive as to hinder risk reduction. Standards should be appropriate for a place’s capacity to implement and enforce them.



## BOX 3

### Case study – DRR in land use planning legislation in Istanbul

In an earthquake-prone city such as Istanbul, Turkey, with 15 million inhabitants, integrating DRR into land use planning is critical for the preservation of assets and for providing a sustainable and resilient city.

Land use planning in Istanbul is regulated by the Spatial Planning Bylaw (updated in 2014) that includes several articles forcing planners to consider natural/man-made hazards in planning processes. For example, according to the bylaw:

– “In the settlements or urban environments where disaster and other urban risks are high, urban risk analysis or prevention plans must be done and disaster risk reduction measures taken into account in the plans” (Article 8, Clause 10);

– “It is essential to consider the disaster risk reduction measures based on relevant hazard reports and geological investigations” (Article 18, Clause 1, sub-clause h);

– “In the places where an approved geological-geotechnical or micro-zonation report does not exist, no land use plan can be prepared” (Article 21, Clause 6);

– “In urban plans; open spaces, roads and other spatial elements that may be needed in a disaster or emergency are taken into account” (Article 21, Clause 13).



In line with this bylaw, circulars were issued in 2002 (No: 113, 114) and 2004 (No: 89, 90) by the Istanbul Metropolitan Municipality (IMM) that make preparation and approval of plans dependent on certification by the Directorate of Earthquake and Ground Research (the department of the IMM responsible for geo-scientific studies and disaster risk analysis). In particular, the Directorate must evaluate whether proposed plans comply with hazard and/ or risk data provided as part of plan preparation. The latter must include a land suitability map (an integrated analysis of geological structure, liquefaction parameters, landslide hazard, tsunami probability and flooding), whose standards are determined by the Ministry of Environment and Urbanization (circular No: 102732, issued in 2011).

These basic legislative measures seek to guarantee the consideration of disaster risks in planning processes for now and into the future. However, current disaster risks linked to earthquakes in Istanbul are due to unplanned and informal developments that have created an extremely dense, vulnerable built environment. It is estimated that a magnitude 7.5 earthquake (a credible worst-case scenario) would cause 30,000-40,000 deaths, based on existing vulnerability of buildings (Strasser *et al.*, 2008).

To try and address these existing risks, new legislation, “The Law of Transformation (Redevelopment) of Areas under the Disaster Risks”, was issued in 2012. This law defines the principles for the renewal (reconstruction) of buildings, both individually or in groups of buildings, in a defined area. These principles include procedures of risk assessment, rehabilitation, clearance, and urban renewal. Implementation of the law has met with criticism – particularly regarding the absence of public participation (ADB, 2016).

As it is difficult to convince the majority required (60%) to sign on to any project, there have been many problems with judicial processes, sometimes leading to the termination of redevelopment. However, if the legislation could be applied in line with lessons learned on participation and consensus, it might serve as an efficient tool to address the existing risks. In general, addressing risk in urban areas is a difficult and politically unpopular task and needs to be handled in the most participatory way possible, considering both human and social developmental needs (resilience), while addressing the vulnerability of buildings in an economically and technically efficient manner.

Clearly, one of the best things that planning can do for DRR is to consistently work with the aim of addressing socio-environmental and spatial (in)justices in urban areas. Such an approach to planning rests on participatory, transparent and accountable governance and a broad-based adherence to the rule of law. In situations where there is a lack of compliance culture, legal sanction efforts should be targeted at larger developments and developers, which can have a greater role in mitigating disaster risk, rather than households

and informal settlements. For the latter, lack of compliance should be understood as a prompt to revisit regulations and standards, or indeed to negotiate alternative settlement options or regulations. Under no circumstances should regulations and standards be used as a justification for forced evictions.

The table below illustrates steps that can be taken to further the integration of DRR into legislative and regulatory frameworks as discussed above.

**TABLE 1**  
How DRR can be integrated into legislative and regulatory frameworks

## HOW DRR CAN BE INCORPORATED

<b>Policy</b>	<p>Ensure that policy links to or consults the direction of international agreements and guides, such as the Sendai Framework, Post- 2015 Agenda.</p> <p>Clearly articulate the direction of how DRR is to be included in planning to guide decision-making processes.</p> <p>Articulate clear linkages between and/or hierarchy of related policies. For example, including DRR and resilience in national urban policy, and/or linking urban policy to national DRM policy that may outline the role of urban planning in reducing disaster risk.</p> <p>Focus on the inclusion and participation in decision-making of women and other marginalized groups that tend not to feature in planning and design.</p> <p>Focus on rights of urban citizens to address the risks that come from lack of access to basic necessities, such as housing, services, and representation (Ziervogel <i>et al.</i> 2017).</p> <p>Slum/informal settlement upgrading policies should also clearly articulate DRR impacts.</p> <p>Consider transboundary cooperation on matters related to land use planning and industrial safety</p>
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<b>Legislation</b>	<p>Specify that DRR is to be included in all levels of plans, regulations and associated instruments (see Johnson, 2011).</p> <p>Be less prescriptive and more flexible to accommodate local needs.</p> <p>Specify and legislate what type of hazard information is needed in regulations and planning approvals (i.e. when an EIA is required and ensuring DRR is a mandated component).</p> <p>Legislate stakeholder and civil participation in planning processes. Clearly establish what participation entails, and its extent in the planning process and decision-making.</p>
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## EXAMPLE

National urban policy, Kenya – DRM has been included as a key focus.

National Strategy for Disaster Resilience, Australia, 2011, clearly articulates the role of urban planning in reducing disaster risk.

Convention on Environmental Impact Assessment (EIA) in a Transboundary Context (Espoo Convention) and The Convention on the Transboundary Effects of Industrial Accidents (UNECE, 2017).

Turkey – Flexible and inclusion of geological requirements into legislation and planning approval process (Johnson, 2011).

<b>Regulations</b>	<p>Specify DRR in appropriate regulations, including those that regulate locational aspects and those that regulate design aspects.</p> <p>Maintain an updated inventory of land use classifications and vulnerability and an urban spatial and building data base to monitor development in hazard-prone areas.</p>	
<b>Standards and codes</b>	<p>Design standards and codes to enable flexibility. Publicize and communicate them.</p> <p>Complexity of standards and codes should correlate with an authority or place's ability to enforce them.</p> <p>Implementing standards and codes may benefit from:</p> <ul style="list-style-type: none"> <li>• Sign posting</li> <li>• Tax incentives</li> <li>• Exchanging rights schemes and land exchange (see Wamsler, 2014:172)</li> <li>• Land pooling and land readjustment programmes (see Wamsler, 2014:172)</li> </ul> <p>Local monitoring groups may be set up as enforcement measures, where local government does not have the capacity to solely enforce.</p>	<p>"Climate safe" building codes.</p> <p>ISO standards for climate change, built environment, organizational sustainability, flooding, etc.</p>



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### Questions for reflection

- Are there laws other than those shown in Figure 3 which have an impact on the urban planning and disaster risk reduction system in your country? Which ones?
- What do you see as the legal and regulatory bottlenecks in mainstreaming DRR in the urban planning system in your city/ country? How can these be addressed, and at what scales/ levels?





### 3.2 Land use and spatial plans

Various kinds of urban and territorial plans, including spatial and land use plans, influence location, the type of development allowed in certain areas, the quality of development, and timing of projects and infrastructure delivery (UN-Habitat, 2015b). Plans can be used to reduce or avoid risks posed by locational factors, such as flood plains, putting such locations to non-sensitive uses – for example, as park land (March and Leon, 2013). The multi-functional use of land can also be a consideration of importance for DRR. For example, schools and other public buildings may be used as refuges during and after disasters, and open spaces and car parks may be designed as temporary water retainers during storms or floods. Further, land use plans and provisions should consider the potential and constraints posed by the sub-surface conditions, where much critical infrastructure is located and where opportunities for risk reduction can often be obtained (see case study on resilience of underground mass rapid transit systems in Box 5).

Integration of DRR into plans can also assist with post-disaster response and rebuilding. Spatial plans can assist to improve emergency response through suitable arrangement of urban form and layout. This may include strategic provision of open spaces and well-planned road networks for rescue operations (March and Leon, 2013).

There are numerous types of spatial plans with different purposes, strengths and weaknesses. The most predominant types, and their ability to enhance or integrate DRR, are reflected in the table below.



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TABLE 2

Types of plans and their potential for integrating DRR

	WHAT IT ENTAILS	POTENTIAL FOR INTEGRATING DRR
Strategic planning	Integrated social, economic, spatial and environmental approaches to land and development, with organizational and institutional change to sustain urban changes. This could be in a form of a city development strategy (CDS)  Typically applies to a single urban area.	Link disaster resilient planning with institutional, organizational and financial mainstreaming.  Identify hazards and risks in SWOT analysis and integrate into plan-making process.  Focus on the political inclusion and participation in decision-making of women and other marginalized groups that tend not to feature in planning and design.
Master planning	Detailed and dynamic long-term plan for economic growth, infrastructure, housing and the built environment.	Tends to take a technical approach to planning and may do so for DRR too. Tendency towards large projects rather than taking on board smaller-scale community adaptive capacities.  May take a heavily regulatory approach to DRR.
Regional planning	Broadly specifies land use, infrastructure and settlement patterns across a region. Likely to encompass multiple governance structures, area plans, and jurisdictions, and types of areas, such as urban, rural, peri-urban and agricultural. Typically applies to a single urban area.	Positively contribute to understanding risks, hazards, exposure and vulnerabilities at the regional level, including rural-urban linkages and impacts.
Informal settlement upgrading	Prioritization of infrastructure for the most vulnerable populations living in slums.	Risk reduction is tied to community-identified urban development priorities. Can enhance risk resilience of marginalized settlements and vulnerable populations.
Urban sectoral plans	Includes transport plans, parks and open space strategies, waste management plans, housing strategies, underground planning, etc.	Identify sector specific actions to minimize risk and prepare for adaptability. Can also set risk-based principles in plans for associated projects and development.



#### Questions for reflection

- What are the different kinds of spatial/ land use/ urban plans deployed in your country?
- How can DRR be mainstreamed in each of these?

One of the first stages in getting started is to ensure that all technical staff and planning departments understand the concepts of resilience and disaster risk reduction and how these should influence their work. Thus, training is an important initial step in the process. Barcelona, which has a large urban resilience and sustainability programme, is an example of a city that is seeking to ensure that city technical staff get adequate training.

## BOX 4:

### Case Study – the role of competent safety authorities in decision-making regarding land use in Estonia

The Estonian Rescue Board (crisis management department and regional and local rescue centres) is responsible for prevention and emergency preparedness for industrial accidents. The board is actively involved in siting and land use procedures and related environmental impact assessment, including screening and scoping, and has a number of binding powers in this respect. Comprehensive, special or detailed spatial plans and building design documentation must be submitted to the board for approval when:

- Selecting the location of a new establishment;
- Expanding the operations of an existing establishment or increasing production, provided that a plan needs to be initiated or amended or a building permit needs to be granted;
- Planning an area located in the danger zone of a hazardous enterprise, an enterprise with a major hazard, or planning construction works there.

The board assesses whether:

- The plan or construction works increase any major-accident hazard or the severity of its consequences;
- The planned accident-prevention measures are sufficient;
- The operator of the establishment must submit additional information to the local authority and to the board before the plan is adopted or the building permit is granted.

The board may reject a proposal if a planned activity in the plan or in the building design documentation increases the risk of a major accident occurrence, or the severity of its consequences, and the planned accident prevention measures are insufficient.

Excerpt from the UN Economic Commission for Europe (UNECE) "Guidance on Land Use Planning, the Siting of Hazardous Activities and related Safety Aspects, 2017."

The UNECE has several legal and policy instruments stipulating land use planning and location decisions, with due consideration to environmental risk considerations (see Annex 3 for more details).



### Questions for reflection

- What are the different kinds of spatial/ land use/ urban plans deployed in your country?
- How can DRR be mainstreamed in each of these?

## 3.3 Urban development and infrastructure projects

Urban development and infrastructure projects include roads and transport, housing, telecommunications, health care facilities, education, open space, water and sewerage infrastructure. The required annual investment in infrastructure is expected to total around 2.5% of global GDP by 2030, or US\$52 trillion (UNISDR, 2015). The complexity of urban infrastructure increases as urban areas expand in population and density (World Bank, 2012). As such, resilient infrastructure systems need to be able to "anticipate, absorb, adapt to and or rapidly recover from a disaster" (UNISDR, 2015).

Whereas urban infrastructure projects should ideally be based on long-term strategic/ master plans, as described in the previous section, in reality, a good deal of city development is instead influenced by investment projects proposed by the private sector or stems from international donor projects. In these situations, long-term strategic plans, assuming they exist, are not necessarily taken into account.

An example of this is the Indian city of Gurgaon, part of the National Capital Region surrounding Delhi. Various development authorities, municipal corporations and private developers have zones to manage, meaning that a holistic plan for Gurgaon has become nearly impossible. Huge tracts of land were given to private developers, who sought to extract as much revenue as possible out of the land rather than create green or public spaces. They did not build the requisite infrastructure to support development, although they say that development charges collected from them towards providing infrastructure were diverted (Kumar and Misra, 2012).

When planning is weak and urban development is driven by projects largely undertaken by the private sector, mainstreaming DRR into such projects becomes extremely critical, but also challenging. Private sector decision-making about where and how to construct influences disaster risks; but it is the public sector and individuals that are most exposed to the consequences should disasters strike. (Johnson *et al.*, 2013). Some of the underlying drivers of risk connected with private-sector developments have been identified as: the amount

of information available to the private sector about hazard risks is not sufficient; the prioritization of short-term returns on investment/financial gains over medium and long-term risk reduction and mitigation; weak or easy-to-flout regulations, and; corruption.

When looking at how infrastructure development can support DRR, two questions must be posed: (a) who or what is the infrastructure for? and; (b) will it support urban trajectories that serve the objectives of DRR and resilience? If those two questions had been answered satisfactorily and reasonably, the city of Gurgaon, mentioned earlier, would look very different today.

The above notwithstanding, urban development and infrastructure projects can build disaster resilience in the following ways:

- Incorporate natural ecosystem services into urban infrastructure and resilience projects by undertaking EIAs to understand and identify how new infrastructure may impact natural systems; and to seek opportunities for enhancing or rehabilitating degraded urban natural environments (World Bank, 2012).
- Design infrastructure so it is prepared to fail in the event of a disaster without creating a catastrophe; and have a plan in place to operate through redundancy and back-up measures (World Bank, 2012).
- Implement upgrading projects or projects geared at improving infrastructure for communities, in partnership with those communities (World Bank, 2012).
- Design large scale underground spaces (e.g., car parking, tunnels, etc.) so they can serve a variety of DRR functions (e.g., as temporary water retention basins, as refuges) while also providing efficient access for servicing dense urban building blocks with water, energy and waste removal services. See Box 5 below on the use of underground space.

Table 3 below shows some key mechanisms by which DRR can be integrated into urban development and infrastructure projects.



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TABLE 3:

How DRR can be integrated into urban development and infrastructure projects

PROJECT PHASE	WHAT IT ENTAILS
Identifying potential projects	Infrastructure projects and investments that will enhance a city's resilience should be prioritized (see Kellett and Caravani, 2013, for discussion on triple benefits of investing in DRR). Project need should be based upon pre-analysis of social, economic and environmental needs and addressing inequalities within these. Ideally, such potential projects should be reflected in spatial plans.
Planning application	Planning throughout project lifespans should adhere to planning framework (which may or may not have provisions for disaster resilience). A clear and detailed risk assessment must be undertaken to understand the potential risk this project entails and to identify possible risk reduction/resilience measures that can be embedded in the project design and planning. Ensuring compliance with regulations, codes and standards should commence in pre-design and planning.
Commencing the project	Include lessons learned from previous infrastructure projects undertaken by the respective organization or city. What could be improved in incorporating risk and resilience?
Procuring the services of firms, organizations or community enterprises to undertake parts or all of the project	Written terms of reference or project conditions should specify a commitment to inclusion of disaster risk considerations throughout a project. Procurement of services from community groups / small and medium-sized enterprises (SMEs) that include disaster risk considerations should be prioritized, where appropriate.
Designing and planning the project	Be informed by data, and local and professional knowledge that can identify the safest areas to prioritize projects and investments as well as reduce episodic and everyday risk. Where data and local knowledge exist on climate change and disaster risk, this can be included in impact studies, including environmental and socio-economic impact assessments. Where this data doesn't exist, engaging with organized communities and universities may assist to collect primary data and inform design. This is also a great opportunity to include stakeholder perceptions and spatial distribution of risk. Scoping of extent of risk and issues to be included for further analysis and inclusion in planning, design, decision-making and monitoring and evaluation (by way of appropriate indicators). Where appropriate for larger projects, the results of risk assessments may be incorporated into a multi-criteria analysis (MCA) or cost-benefit analysis (CBA), if these are used. Incorporate into (detailed) design and planning, structural mitigation. Structural approaches to reducing risk are most effective when they are addressed during the initial design and construction using a thoughtful combination of local building practices, including land use regulations and building codes that address modern design technologies (World Bank, 2012)
Financing	Incorporating DRR measures early on in the project planning and identification will reduce any extra costs for implementing DRR measures (Bosher, 2013). Can extra incentives be offered by government for those projects which incorporate DRR or resilience measures? Will insurance be less expensive?
Implementation	Participation of relevant stakeholder to ensure that DRR measures are being implemented as specified. Consistent checking of quality of materials and construction quality.
Monitoring and evaluation (M&E)	Measures for M&E should include risk indicators. These can be developed from risk assessment undertaken in the design and planning stages (see World Bank, 2012).

## BOX 5:

### Case Study – Smart combinations of surface land use and underground space use offer important opportunities for DRR

The Storm-water Management and Road Tunnel (SMART) is a multipurpose tunnel that serves both water management and traffic management in the central business district (CBD) of Kuala Lumpur, Malaysia.

SMART combines two uses that would normally seem incompatible. Most of the time, traffic is diverted from the congested CBD through a road tunnel that runs inside a storm water tunnel. Brown (2014) mentions a 75% reduction in travelling time and reduced air pollution, as traffic jams are avoided. The storm-water tunnel itself has three modes, including one mode where traffic is stopped, and the road tunnel is opened to flood waters. In this way, 90% of storm water can be discharged using SMART and flooding of the CBD is averted. The smart thing is the way the system is financed. A toll is charged for the road tunnel, and this helps, together with the cost saved in cleaning up flood damage, in recovering the initial investment cost in a relatively short time (UNISDR, 2012).



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A similar example to the SMART can be found in Rotterdam, the Netherlands.

In the Museum Park area of Rotterdam, an underground parking lot was planned. By excavating deeper, sufficient space was created for both the underground parking and an underground storm-water retention basin. Although the two uses are separate from each other, the combined use of underground space illustrates what Brown calls coupled and co-located projects (Brown, 2014). The retention basin provides a 10-million-cubic-metre storage space in case the city's canal system reaches full capacity during heavy rainfall. The storm water is diverted to the basin and pumped out using the sewer system after the rainfall has stopped (City of Rotterdam, 2016). The project is one of the measures from the Water Plan 2, a collaboration between the city and the Water Authority aimed at reducing flooding risk for the city centre.



<https://www.rotterdam.nl/wonen-leven/waterberging-museumparkgarage/>



### Questions for reflection

- What is the relationship between plans and projects in your city? Who are the major actors involved in planning and executing urban projects?
- Can you think of any example(s) where DRR has been fully integrated into an urban development or infrastructure project? What made this possible?

### COST-BENEFIT ANALYSIS:

A method to assess a broader range of positive and negative impacts of an investment to the public and the city government's key stakeholders

(World Bank, 2012). This includes financial, environmental and social impacts which are expressed in monetary terms.

### 3.4 Informal urban interventions

A key element to be considered in many cities in low and middle-income countries is that only a small percentage of city development is implemented according to formal plans. For example, in Dar es Salaam, in Tanzania, 70% of the city's residents live in unplanned settlements. There are many types of processes that produce the built environment, including informal construction, in the form of residential settlements and industrial or commercial buildings; informal economic activities, for example, street vending or home-based enterprises; or community-based upgrading efforts and community-installed infrastructure. This informal built environment straddles income and spatial divides – it is not only the poor who are living and working in informal constructions, it is also the rich, and those in between. There are also professionals involved in shaping it – small and medium-scale developers, architects and engineers, as well as land-owners, residents and businesses.

Many of these informal urban development processes and activities do not follow development control regulations strictly, or at all, which makes them vulnerable to natural induced disasters and man-made crises. Construction may be located in areas exposed to hazards, and construction materials and technologies may not be robust enough, or there may be a lack of basic infrastructure. The communication of information about safe building techniques and safe areas for development should, therefore, become an important statutory function.



Dar es Salaam  
Photo by Alex Macfarlane

However, infringement of controls and regulations – and addressing DRR – in informally built areas is often being used as a means to evict people from lands they may have occupied for some time. In some cases, as in settlements along the Msimbazi River in Dar es Salaam, multiple land tenure claims have compounded opaque disaster risk regulations to legitimize evictions. Yet, rarely is eviction or resettlement a solution for DRR. Co-produced upgrading or infrastructure improvements, with the strong participation of those involved, can offer better outcomes for people and for a city (Lavell, 2016).

To address disaster risks and build resilience in the informally produced city, planning needs to come to terms with the reality of multiple planning actors and adopt a multi-stakeholder approach. It is possible to build essential infrastructure, provide public services and reduce disaster risk in cities that are largely informally produced through negotiated agreements with communities and other stakeholders. A case in point is that of Medellin, which has transformed itself from one of the most dangerous cities in the world in the 1990s, to a safe, inclusive city that not only recognizes or acknowledges informality and risk but has started to constructively deal with them. Well-conceived spatial and urban policies, implemented in consultation and partnership with local communities and businesses, have had an impact in defusing conflict and urban violence in Medellin and sharpening the focus on risk reduction and resilience building.



Medellin  
Photo by Barbara Lipietz

Another example is that of the Baan Mankong (“Secure Housing”) programme in Thailand, where government funding has been channelled to networks of community organizations for informal settlement and neighbourhood upgrading. Such funding is based on the principle of demand-led funding, where organized communities request funding from national governments for upgrading of their neighbourhoods. This programme has enabled not only the material improvement of more than 104,000 households throughout the country, it has also supported the development of strong community networks of women and men able to respond rapidly to disaster situations (Boonyabancha and Kerr, 2018; Archer and Boonyabancha, 2011).

#### Questions for reflection

- What is the extent of informal development in your city, i.e., development that takes place which is not compliant with existing urban or land use plans? What do you think are the major reasons for informal development?
- How can DRR be addressed in situations where there is a high level of informality?
- Are you aware of any examples where poor communities have taken steps towards DRR in their local environment? How can these initiatives be supported or scaled up?



## EXPLORE MORE

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City of Barcelona, Planning, Ecology and Mobility  
<http://ajuntament.barcelona.cat/ecologiaurbana/en>

Caribbean Handbook on Risk Management: a guide for risk assessment and planning:  
<http://www.charim.net/>

Effective law and regulation for disaster risk reduction: a multi-country report. IFRC and UNDP, 2014  
<https://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/effective-law---regulation-for-disaster-risk-reduction.html>

Reducing Relocation Risks in Urban Areas  
<https://www.ucl.ac.uk/bartlett/development/reducing-relocation-risk-urban-areas>

Integrating Climate Change into City Development Strategies (CDS). UN-Habitat, 2015  
<https://citiesalliance.org/resources/knowledge/cities-alliance-knowledge/integrating-climate-change-city-development>

## USEFUL TOOLS

Reducing disaster risk by managing urban land use: Guidance notes for planners. Asian Development Bank, 2016.  
<https://www.adb.org/sites/default/files/publication/185415/disaster-risk-urban-land.pdf>

Promoting use of disaster risk information in land-use planning. Asian Disaster Preparedness Center and Regional Consultative Committee on Disaster Management, 2011.  
<http://www.preventionweb.net/publications/view/24664>

Urban Resilience Master Planning: A Guidebook for Practitioners and Policymakers. EMI, 2016.  
<https://emi-megacities.org/?emi-publication=urban-resilience-master-planning-a-guidebook-for-practitioners-and-policymakers>

An Overview of Tools for Integrating Environmental Management and Disaster Risk Reduction.  
 The Global Development Research Centre.  
<http://www.gdrc.org/uem/disasters/disenvi/tools/>

Guidance on land-use planning, the siting of hazardous activities and related safety aspects. United Nations Economic Commission for Europe, 2017.  
<http://www.unece.org/index.php?id=47851>

International Guidelines on Urban and Territorial Planning. UN-Habitat, 2015.  
<https://unhabitat.org/international-guidelines-on-urban-and-territorial-planning>



# 04

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## FINANCING OPTIONS





Mainstreaming DRR into various elements of the urban planning system includes exploring financing options for DRR (see Figure 4). In most parts of the world, municipal expenditure is fraught with complex priority setting to match limited budgets with growing, competing demands. Few cities world-wide have integrated or fully mainstreamed DRR into municipal planning (like Cairns, Australia); fewer still have mainstreamed DRR into municipal budgeting (Johnson and Blackburn, 2014). The case for focusing on pre-disaster risk management as a long-term municipal investment with multiplier effects has not yet been made effectively, despite research and evidence pointing to at least three benefits stemming from budgeting for DRR. These benefits are: avoiding losses when disasters strike; stimulating economic activity associated with reduced risk, and; “win-win” situations for development, including facilitating wealth, health and sustainable development (ODI, 2015).

In a competitive municipal funding environment, international funding for DRM can appear to be a promising avenue. However, current DRM funding from international funds is largely geared at post-disaster recovery and reconstruction, rather than supporting pre-disaster risk reduction, as advocated by the Sendai Framework. Climate funding provides another funding avenue and appears to be more established than funding for DRR alone. This probably explains why the Sendai Framework calls for integration of disaster risk reduction measures into multilateral and bilateral development assistance programmes related to climate change adaptation.



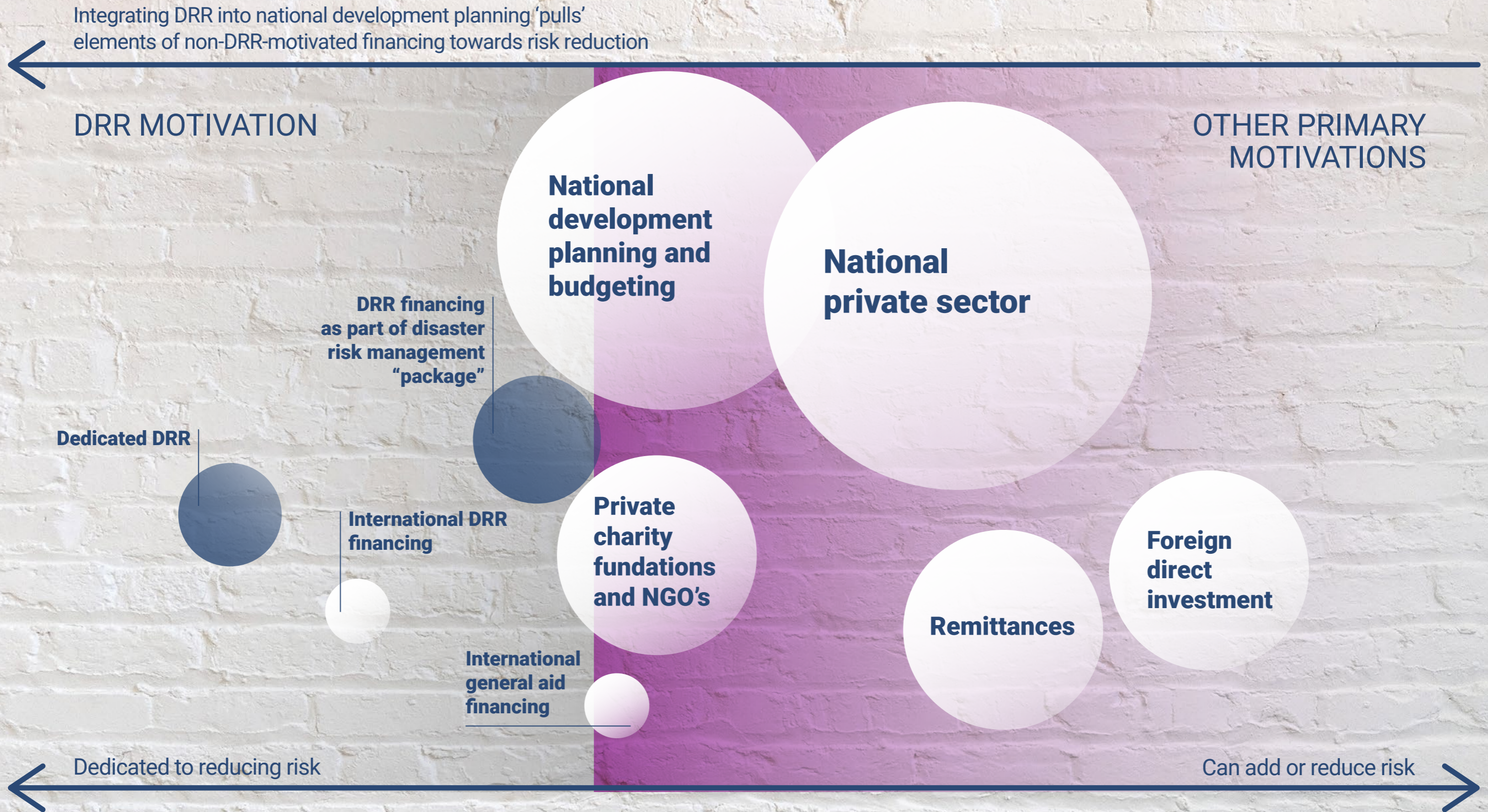


FIGURE 4

The taxonomy of DRR financing (Source: Kellett, Caravani and Pichon, 2013).

**Note:** The size of the "circles" gives some indication of the relative importance of these sources of financing. Blue circles represent areas of national finance that could also be responsible for developing risk reduction policies that could affect other financial flows

Persistent challenges remain in terms of accessing international funding – particularly for municipal governments in low- and middle-income countries (Wamsler, 2014). The majority of climate finance goes through national governments and adequate funds do not always reach city and local governments. A paper published by Smith, Brown and Dodman (2014) argues for more direct mechanisms for organized urban communities to seek funding from international sources, in collaboration with local governments. The authors point to the extensive experience of community savings groups in raising and managing funds geared at upgrading their living environment. Such an approach to channelling international funds would offer scope for greater integration of slum upgrading and climate change adaptation measures, as well as empowering stakeholders on the ground.

It points to a burgeoning creativity with regards to financing for disaster risk management. By and large, these “new” financial initiatives specifically for disaster risk management build upon the current focus that many local governments have on improving internal sources of revenue through, for example, property tax collection and public land leasing, or improving the productive capacities of cities (through better planning and smarter mobility, for instance). In some contexts, such processes have been explicitly accompanied by attempts to channel internal resources in ways that address unequal infrastructure provision, thereby addressing cities’ overall resilience. Belo Horizonte’s (Brazil) participatory budgeting process is a case in point, where participatory budgeting has enabled an inversion of spending priorities towards traditionally excluded areas and neighbourhoods (Cabannes and Lipietz, 2018). Participatory budgeting is a form of decision-making that actively involves the citizenry in prioritizing spending of public resources.

A review of participatory budgeting spending in Belo Horizonte shows that the great majority of the financing is spent less than 500 metres away from the population who made the decisions – that is, participatory budgeting projects have been highly accessible. Moreover, the population closest to participatory budgeting projects, those most likely to benefit from them, have been the poorest families in the city (Carvalho and Camargo, 2007).

Efforts to work creatively with internal financial resources have also targeted political exclusion. In Seville (Spain), for instance, the participatory budgeting process has created a number of different assemblies in a deliberate attempt to facilitate the participation of women, youth and migrant communities in decision-making on the municipal budget. In Campinas (Brazil), a specific committee was set up to seek to bring excluded or minority communities to the participatory budgeting table (Cabannes and Lipietz, 2018).

Other locally based approaches to financing disaster risk management in cities seek to develop partnerships with other actors or incentivize DRM processes among multiple planning agents. Such incentive structures include:

- I) Personal and corporate tax reductions for infrastructure built in low-risk zones or to particular disaster-resilient standards;
- II) Subsidies for commerce, manufacturing and industrial enterprises located in lower risk areas;
- III) Easing of height restrictions and floor area ratios for property developers that adopt strong resilience features;
- IV) Risk-based insurance premiums and deduction differentials for properties that incorporate DRR measures in their design;
- V) Provision of secured land tenure and enhanced social services for informal settlers that relocate to lower risk zones (Benson, 2016).

The case study from Canada below illustrates how creative partnerships between the public and private sectors can address disaster risk in an effective manner.

## EXPLORE MORE

10 things to know about financing for reducing disaster risk. ODI, 2015  
<https://www.odi.org/publications/9334-10-things-know-about-finance-reducing-disaster-risk>

Financing the Resilient City: A demand-driven approach to development, disaster risk reduction and climate adaptation. ICLEI, 2011  
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Reconfiguring urban adaptation finance. IIED, 2014  
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## BOX 6:

### Case Study – Flood insurance in Canada: A win-win partnership between the community, public and private sectors

The Partners for Action (P4A) initiative in Canada demonstrates how targeted data and research can drive coalition building and lead to a broad public policy discussion on risk-based solutions, involving property developers, insurance companies and property owners. Over several years, P4A has engaged diverse stakeholder groups, including NGOs, the three levels of government (municipal, provincial and federal) and the insurance industry, on the risks of overland and urban floods in Canada and to encourage Canadian decision-makers to make adaptation decisions aimed at protecting homes, businesses, infrastructure and communities. In May 2015, after more than three years of research and consultation, the Co-operators became the first Canadian insurer to bring a homeowner’s flood insurance product to the market. Aviva Canada and other insurers have followed since. The agreement reached through the P4A partnership was that increasing access to insurance covering flood damage would be accompanied by: a) communication and awareness-building campaigns to ensure that Canadians understood the risk that overland and urban floods present to their homes, businesses and communities, and; b) sound adaptation decisions by policy-makers, aimed at protecting homes, businesses, infrastructure and communities (UNDP, 2015, as cited in IFRC, 2016).



# 05

## CONCLUSIONS



The agreements that form part of the 2030 Development Agenda clearly acknowledge urbanization as one of the dominant trends of our time and recognize its role in ensuring a sustainable future for our planet and its inhabitants. There is also an explicit acknowledgement of the role of land use and urban planning in achieving the Sustainable Development Goals and other aspirations laid out in the 2030 Agenda, including the goals of the Sendai Framework for Disaster Risk Reduction.

Such a recognition of the role of planning in DRR and resilience building must, however, be understood in context: for too long, planning to address contemporary development challenges has not been fit for purpose.

Traditional, strict, master-planning, with its rigid (even draconian) rules and standards, has often undermined the principles of social and spatial justice instead of furthering them. Planning standards (and non-compliance to these) have regularly been used to evict those who fail to fit into policymakers' gleaming visions of world-class cities, further weakening rather than building their resilience.



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below left: ©Shutterstock/Dmitry Polonskiy  
below right: ©Unsplash/Azlan Baharudin



The following key messages may be kept in mind when exploring how DRR can be mainstreamed in land use and urban planning in any given context:

1. Not every kind of planning builds resilience. All efforts must be made to ensure that planning visions have resilience and disaster risk reduction at their core so that these elements become central to the purpose of planning.
2. A "back to the basics" approach is central to resilience building. It implies keeping in mind that planning's major purpose is to promote social and spatial equity and justice. Taking a strategic approach, this means ensuring access to well-located land, flexibility in standards and regulations, maintaining and developing infrastructure, public service delivery and financing.
3. DRR efforts must be mainstreamed throughout formal and informal planning processes and the entire planning cycle, and integrated into the planning system as such, including legal and regulatory frameworks and financing arrangements.
4. Planning is a multi-actor process that involves governmental and non-governmental actors. Not all planning – in fact, not much, in the developing world – is done by planners. The role of communities, the large/medium/small-scale private sector and professionals must be acknowledged and supported if DRR is to be mainstreamed through all planning efforts.
5. Policymakers should look for context-specific models and good practices and explore how they can be scaled up instead of applying one-size-fits-all solutions.
6. Effective coordination and cooperation, both within the country and with neighbouring and riparian countries, among the relevant authorities responsible for decision-making on land use planning and siting and environmental and risk assessments, are essential for effective DRR. This is particularly relevant for technological disaster risk reduction, where land use and location decisions are essential for risk mitigation.



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# ANNEXES

## 1. Terminology

**Building code** “A set of ordinances or regulations and associated standards intended to regulate aspects of the design, construction, materials, alteration and occupancy of structures which are necessary to ensure human safety and welfare, including resistance to collapse and damage” (United Nations General Assembly, 2016:11). This includes both technical and functional standards and must be accompanied by a systematic enforcement regime in order to be effective.

**Cost-benefit analysis** “A method to assess a broader range of positive and negative impacts of an investment to the public and the city government’s key stakeholders” (World Bank, 2012). This includes financial, environmental and social impacts that are expressed in monetary terms.

**Disaster** “A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic or environmental losses and impacts” (United Nations General Assembly, 2016:13).

**Disaster risk** “The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity [...] It is important to consider the social and economic contexts in which disaster risks occur and that people do not necessarily share the same perceptions of risk and their underlying risk factors” (United Nations General Assembly, 2016:14).

**Disaster risk assessment** “A qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend” (United Nations General Assembly, 2016:15).

**Disaster risk management** Disaster risk management: “The application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses” (United Nations General Assembly, 2016:15).

**Disaster risk reduction** “Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development [...] Disaster risk reduction is the policy objective of disaster risk management, and its goals and objectives are defined in disaster risk reduction strategies and plans” (United Nations General Assembly, 2016:16).

**Environmental impact assessment** Process by which the environmental consequences of a proposed project or programme are evaluated and undertaken as an integral part of planning and decision-making processes with a view to limiting or reducing the adverse impacts of the project or programme (UNISDR, 2009).

**Exposure** “The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas” (United Nations General Assembly, 2016:18).

**Hazard** “A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation [...] Hazards may be natural, anthropogenic or socio-natural in origin” (United Nations General Assembly, 2016:18).

**Land use planning** The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long-term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses (UNISDR, 2009).

**Resilience** “The ability of a system, community 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 the preservation and restoration of its essential basic structures and functions through risk management” (United Nations General Assembly, 2016:22).

**Standards** (relating to buildings and the built environment, such as roads and bus stops) Cover the physical characteristics, materials, components and buildings and how they will be deemed as satisfactory for use in the given context. They regulate design by specifying such items as room size, distance from adjacent buildings, types of material and construction techniques. Codes and regulations refer to standards.

**Urban and territorial planning** “Combines several spatial, institutional and financial dimensions over a variety of timeframes and geographical scales. It is a continuous and iterative process, grounded in enforceable regulations, that aims to promote more compact cities and synergies between territories” (UN-Habitat, 2015a).

**Vulnerability** “The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards” (United Nations General Assembly, 2016:24). [Sustainable development]



## 2. Questions for reflection

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1. What are the drivers of urban risk in your city/ country?
2. How does the urban and land use planning system work in your city/country? Is disaster risk reduction addressed as part of urban planning?
3. Which are the laws that have an impact on the urban planning and disaster risk reduction system in your country?
4. What do you see as the legal and regulatory bottlenecks in mainstreaming DRR in the urban planning system in your city/ country? How can these be addressed, and at what scales/ levels?
5. What are the different kinds of spatial/ land use/ urban plans deployed in your country? How can DRR be mainstreamed in each of these?
6. What is the relationship between plans and projects in your city? Who are the major actors involved in planning and executing urban projects?
7. Can you think of any example(s) where DRR has been fully integrated into an urban development or infrastructure project? What made this possible?
8. What is the extent of informal development in your city, i.e., development that takes place which is not compliant with existing urban or land use plans? What do you think are the major reasons for informal development?
9. How can DRR be addressed in situations where there is a high level of informality?
10. Are you aware of any examples where poor communities have taken steps towards DRR in their local environment? How can these initiatives be supported or scaled up?
11. What are the major sources of revenue in your city?
12. What are the major areas of development expenditure in your city? Is the majority of resources being directed towards creating new infrastructure or extending services to under-served areas?
13. Are there dedicated resources for DRR? To what extent are they focused on preparedness, recovery or risk reduction?

## 3. Additional resources

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Networks, resource portals and campaigns

ALNAP - Urban Humanitarian Response Portal

<http://www.urban-response.org/>

This portal contains shared knowledge and resources on urban humanitarian crises. It includes programme reports, lessons learnt, policies, tools and methodologies relevant to responding to crises in urban environments.

Disaster Assessment Portal

<https://www.cepal.org/en/headquarters-and-offices/eclac-caribbean/disaster-assessment/disaster-assessment-portal>

Provides resources and steps to assist with conducting disaster assessments.

Earthquakes and Megacities Initiative (EMI)

<http://emi-megacities.org/>

This website contains a number of resources relating to megacities, resilience, risk and earthquakes. There are a number of resources specifically addressing land use and master planning. The publications and guidelines are predominantly produced by EMI, along with a number of webinars, and forthcoming tools and city profiles.

Global Facility for Disaster Reduction and Recovery (GFDRR)

<https://www.gfdr.org/>

The GFDRR is a global partnership working with over 400 local, national, regional and international partners to provide knowledge, funding and technical assistance to help developing countries better understand and reduce their vulnerability to natural hazards and climate change. The website contains a wealth of publications related to risk, disasters and recovery, including case studies and country risk assessments. See the website for details of their programmes and tools related to building regulations, safer schools, city resilience, urban risk data for African cities, financial resilience to disasters and many others.

Prevention Web – Urban Risk & Planning Theme

<http://www.preventionweb.net/english/themes/urban-risk/>

Within the theme of “urban risk and planning”, this site provides a range of reports, materials, news, external links and networks, upcoming events and training opportunities that are relevant to reducing urban risk, hazards and vulnerabilities.

Making Cities Resilient: My City is Getting Ready

<http://www.unisdr.org/campaign/resilientcities/>

This website contains information relating to the city-focused campaign that aligns with the international disaster risk reduction frameworks. It includes resources, toolkits and information on the benefits of joining the campaign and how to join.

The 100 Resilient Cities, pioneered by the Rockefeller Foundation

<http://www.100resilientcities.org/>

This programme assisted cities around the world with technical support to become more resilient to the physical, social and economic challenges of urbanization. The website contains reports from over 100 cities and toolkits about measuring urban resilience. This programme officially closed in 2019.

UN-HABITAT – Urban Resilience Hub

<http://urbanresiliencehub.org/>

Network of UN-Habitat partner organizations, including think-tanks, universities and governments, providing space for knowledge, best practice and innovation. The website includes the latest resources for cities, thought pieces communicating new ideas and thinking, testimonies, communities of practice and city profiles.

The United Nations Economic Commission for Europe (UNECE) has several legal and policy instruments stipulating land use planning and location decisions, with due consideration to environmental and risk considerations:

- Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and its Protocol on Strategic Environmental Assessments (SEA) <https://www.unece.org/index.php?id=47567>
- Convention on the Transboundary Effects of Industrial Accidents, <https://www.unece.org/index.php?id=45611>
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice (Aarhus Convention), <https://www.unece.org/index.php?id=25695>
- Various legal and policy instruments developed under the Committee on Urban Development, Housing and Land Management (CUDHLM), such as the Geneva UN Charter for Sustainable Housing and the Geneva Ministerial Declaration on Housing and Urban Development, <http://www.unece.org/housing.html>



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## 4. Ten Essentials for Making Cities Resilient

Sendai Framework priorities for action and the ten essentials for making cities resilient, and what they mean at the local level:

### Sendai Priorities for Action

**Priority for Action 1.**  
Understanding disaster  
risk

### Ten Essentials for Making Cities Resilient

Identify, understand and  
use current and future risk  
scenarios  
(Essential 2)

### What does it mean at the local level?

- Have up-to-date information on extensive and intensive risks, small and large-scale disasters and slow and rapid onset disasters. Understand how they (may) change in relation to development trajectories, demographic trends, urbanization and climate change
- Understand the timescales over which risks change and impacts occur
- Have updated information of the main hazards in your region, how they change over time, and how multiple hazards may combine
- Consolidate up-to-date information about exposure, vulnerability and coping capacities of people, assets and activities. Integrate scientific and lay knowledge (i.e. consider the latest available climate data and scenarios, seismic information, census data, etc.), but also participatory mapping, enumerations, perception surveys, etc.)
- Have updated information of critical infrastructure and services, the potential impacts of hazardous events and cascading effects
- Develop mechanisms to update data and to generate local disaster risk knowledge, enabling local actors to access and exchange risk-related information
- Make sure that risk information is widely communicated and available to all stakeholders, in easy language and a usable format, so that risk information is factored into all decision-making processes

Pursue resilient urban  
development and design  
(Essential 4)

- Update zoning and land use regulations and building codes to avoid generation of new risks, reduce current ones and enhance resilience based on up-to-date local information
- Ensure suitable land for different urban needs (residential, industrial, recreational, etc.) and adequate housing (in terms of size, quality and location)
- Plan and make sure that different land uses receive appropriate infrastructure and services
- Manage urban development in risk-prone areas (e.g., floodplains, slopes and coastal areas). Enforce regulations
- Anticipate urban changes and plan for the short, medium and long-term

Safeguard natural buffers to  
enhance ecosystems' protective  
functions (Essential 5)

- Identify local ecosystems and understand their role in reducing disaster impacts (e.g., slope stabilization, flood protection and enhancement of water quality, reduction of heat island effect, etc.) and their contribution to climate change mitigation (within the city and the surrounding region)
- Have updated information on natural areas and their current and potential uses. Consider multiple information sources

<b>Priority for Action 2.</b> Strengthening governance to manage disaster risk	Organize for disaster resilience (Essential 1)	<ul style="list-style-type: none"> <li>• Ensure disaster risk governance is a key component of the vision and/or strategic development plan of the city, recognizing the relevance of participatory and inclusive mechanisms for DRR and resilience</li> <li>• Discuss and agree on the levels of disaster risk that are acceptable to your city. Revise them over time</li> <li>• Establish a single point of coordination (focal point/government office) which is accepted by all actors and with strong leadership, political support (e.g., from the highest elected level) and resources (human and financial)</li> <li>• Ensure that all departments in the local government understand the importance of DRR and resilience and how they relate to their everyday work and to overall city development goals</li> <li>• Define clear roles and responsibilities among city government's staff and decision makers, but also between civil society and the private sector so that all stakeholders contribute to DRR and resilience</li> <li>• Build up alliances and collaboration processes horizontally (across sectors and actors within the city and with neighbouring cities) and vertically (across different politico-administrative levels)</li> <li>• Have a clear operational framework to make collaboration possible</li> <li>• Approve codes and bylaws and/or revise existing ones to integrate resilience attributes</li> <li>• Have in place reporting mechanisms for all stakeholders that collect/process/consolidate key information</li> </ul>
	Strengthen institutional capacity for resilience (Essential 6)	<ul style="list-style-type: none"> <li>• Identify local capacities among different actors and agree on division of responsibilities. Secure effective communication so everyone knows "who does what"</li> <li>• Strengthen local capacities to better understand the relevance of integrated responses, linking DRM to climate change and sustainable development</li> <li>• Develop capacities and local know-how via training activities and knowledge exchange (within your city, with other cities, with the private sector, etc.)</li> <li>• Develop a portfolio of project proposals that addresses different issues in your city and which is ready to submit to different funding opportunities</li> <li>• Share information and knowledge; work towards guaranteeing access and interoperability</li> </ul>
	Understand and strengthen societal capacity for resilience (Essential 7)	<ul style="list-style-type: none"> <li>• Work with local actors to take into account their views/opinions on different development alternatives</li> <li>• Secure mechanisms for participation in planning, implementation and monitoring and evaluation processes</li> <li>• Support the work of community-based organizations and local NGOs (e.g., from work on housing and water and sanitation to specific emergency response)</li> <li>• Target different groups and/or sectors, such as businesses and industries, schools, professional associations, etc.</li> </ul>

<b>Priority for Action 3.</b> Investing in disaster risk reduction for resilience	Strengthen financial capacity for resilience (Essential 3)	<ul style="list-style-type: none"> <li>• Work on financial planning and definition of priorities to ensure that actions to build resilience receive support</li> <li>• Earmark an annual budget for DRR and resilience – it can be distributed between different offices/sectors</li> <li>• Develop an inventory of financing mechanisms and potential sources</li> <li>• Ensure adequate financial support to vulnerable groups (e.g., via social protection, microfinance, etc.)</li> <li>• Ensure that funds invested in response and recovery also include building back better and pursue sustainable development</li> </ul>
	Pursue resilient urban development and design (Essential 4)	<ul style="list-style-type: none"> <li>• Approve codes and by-laws and/or revise existing ones to integrate resilience attributes into building codes and spatial planning, aiming to prevent the creation of new risk and reduce existing risk</li> </ul>
	Safeguard natural buffers to enhance ecosystems' protective functions (Essential 5)	<ul style="list-style-type: none"> <li>• Ensure appropriate legislation to safeguard ecosystems and their protective functions, including funding schemes for multiple uses and collaborative conservation</li> <li>• Develop programmes to ensure all citizens understand the protective role of ecosystems (among other services)</li> <li>• Consider green and blue infrastructure or nature-based solutions to enhance local resilience</li> <li>• Work in collaboration with neighbouring cities and broader administrative levels (e.g., region or basin) to safeguard ecosystems and their protective functions</li> </ul>
	Increase infrastructure resilience (Essential 8)	<ul style="list-style-type: none"> <li>• Assess if current infrastructure is adequately designed, built and maintained to respond to current and future risk scenarios</li> <li>• Prioritize areas for investment in existing and new infrastructure</li> <li>• Have guidelines for risk-sensitive development of future infrastructure</li> <li>• Have processes in place to ensure operability of critical infrastructure in the event of acute shocks or stresses. Have spare capacity (e.g., redundancy) to cope with a combination of risks</li> <li>• Ensure that service providers understand disaster risk and the role of infrastructure in reducing current and future risks</li> </ul>
<b>Priority for Action 4.</b> Enhancing disaster preparedness for effective response, and to Build Back Better in recovery, rehabilitation and reconstruction	Ensure effective disaster response (Essential 9)	<ul style="list-style-type: none"> <li>• Have emergency plans/protocols in place with clearly defined roles and responsibilities for all local actors. Establish coordination mechanisms and assign resources where needed.</li> <li>• Validate emergency plans/protocols with all local actors</li> <li>• Communicate emergency plans/protocols and test them periodically (e.g., design regular drills according to type of emergency and sector)</li> <li>• Have early warning systems (EWS) broadcasted to all citizens for effective and quick response</li> <li>• Ensure availability of equipment and supplies</li> <li>• Assess and evaluate response capacity to continuously improve it</li> </ul>

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Expedite recovery and build back better (Essential 10)

- Have a local strategy for post-disaster recovery, rehabilitation and reconstruction
  - Appoint a coordinating office for recovery and define roles and responsibilities for different actors/ sectors
  - Earmark financial resources for recovery
  - Promote insurance coverage and other risk transfer mechanisms. Generate incentives for households, businesses, industries, etc., to purchase and/or embrace them
  - Consider new and/ or changing risks when building back
  - Derive lessons from recovery processes to further build resilience
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*Source: Authors' elaboration based on revised Ten Essentials.*



# WORDS INTO ACTION

## IMPLEMENTATION GUIDE FOR LAND USE AND URBAN PLANNING

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