06

UNDRR
UN Office for Disaster Risk Reduction

SENDAI FRAMEWORK
FOR DISASTER RISK REDUCTION 2015-2030

LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES

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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WORDS
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UNDRR
UN Office for Disaster Risk Reduction

FOREWORD

Mami Mizutori

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

A key responsibility of cities is to ensure the well-being of their citizens. In the past decades, more and more people have migrated to settle in cities, searching for better economic opportunities, education for their children, or after having been displaced from their traditional homes. However, through rapid population growth that outpaces service delivery cities can be easily overwhelmed. Unplanned urbanization increases the vulnerability of urban populations to many risks, including disaster risk.

Adopted by United Nations Member States in 2015, the Sendai Framework for Disaster Risk Reduction was conceived to prevent the creation of new disaster risks, to reduce existing ones and to limit losses to lives and livelihoods, economic losses and damage to infrastructure. It outlines seven targets that are underpinned by advocating a greater understanding of disaster risk, and strengthening the resilience of people and communities, with a particular focus on those most at risk. It calls upon all of society to take responsibility for ensuring risk-informed development, planning and investments. The United Nations Office for Disaster Risk Reduction (UNDRR) is the focal point of the United Nations' system for disaster risk reduction. UNDRR supports countries and societies in Sendai Framework implementation and monitoring, and in reviewing progress.

The Sendai Framework highlights the role of local authorities in DRR. The efforts of UNDRR and its partners to emphasize the importance of cities and local governments in DRR and in building resilience can be traced back to the launching of the UNISDR Making Cities Resilient campaign in 2010. Target (e) of the Sendai Framework aims to substantially increase the number of countries not only with national, but also local DRR strategies. Cities and communities are key partners in these efforts.

We hope this guide will inspire many actors who are interested in creating effective local resilience strategies and that it will help local governments towards the development and fine-tuning of local disaster risk reduction strategies, supporting cities to become more resilient.

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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 and strengthening good governance in disaster risk reduction (DRR) strategies, at all levels and across sectors and actors. The guide advises local governments (authorities, planners and managers at city or other subnational levels) on the mechanisms for developing and implementing a holistic and integrated DRR strategy that contributes to building resilience at the local level. It outlines what a local DRR and resilience strategy should look like, and what is needed to create and implement one.

The main authors of this guidebook are Jorgelina Hardoy (IIED – América Latina) and María Evangelina Filippi (PhD candidate, UCL), under the coordination of Dr Cassidy Johnson (UCL) and with the support of Ebru Gencer (CUDRR+R), Braulio Eduardo Morera (100 Resilient Cities) and David Satterthwaite (IIED).

The authors are grateful to Jerry Velásquez (former staff of the UN Office for Disaster Risk Reduction), Ricardo Mena, Sanjaya Bhatia, Mutarika Pruksapong, and Abhilash Panda (UN Office for Disaster Risk Reduction), Sahar Safaie and Fernanda Del Lama Soares (consultants) for their valuable advice and guidance. The comments and suggestions provided by reviewers and authors of case studies added significant value to the guidebook. They are hereby recognized for their contribution: Kimberly Awino Oganda (CORDAID), Fernando Britto (Making Smart Cities Initiative), Riyanti Djalanti (UNU-IAS), Rohit Jigyasu (ICOMOS), Goto Ko (JICA), Sasja Kamil (CORDAID), Vera Kreuwels (CORDAID), Alaistar Norris (Build Change), Kathy Oldham (Association of Greater Manchester Authorities, UK), Lina Ringberg (Malmo, Sweden), Yohan Santosa (KARINA Organization), Violeta Seva (Makati City, Philippines), Madhusudan Singh (ICOMOS), Andrea Valsagna (Municipal Government of Santa Fe, Argentina) and Julia Wesely (UCL). The public review of the guidebook provided relevant insights and we appreciate the effort of those who contributed their time and shared their expertise. Finally, we would also like to thank the UN Office for Disaster Risk Reduction Urban Planning Advisory Group (UPAG) for constantly supporting the work on making risk reduction and resilience integral to cities' planning practices.

WORDS INTO ACTION GUIDELINES SERIES OVERALL COORDINATION

Dave Paul Zervaas, United Nations Office for Disaster Risk Reduction (UNDRR)

CONTENTS

LIST OF ACRONYMS

AGMA	Association of Greater Manchester Authorities
AISR	AI Systems Research
BDRRMC	Barangay Disaster Risk Reduction and Management Committee (Philippines)
DDMP	District Disaster Management Plan (Kullu District, Himachal Pradesh, India)
DRM	Disaster Risk Management
DRRMC	Disaster Risk Reduction and Management Council (Philippines)
DRRMO	Disaster Risk Reduction and Management Office (Philippines)
DRR	Disaster Risk Reduction
GAD	Gender and Development
GM	Greater Manchester
GMRF	Greater Manchester Resilience Forum
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change
LDRRMF	Local Disaster Risk Reduction and Management Fund (Philippines)
LDRRMP	Local Disaster Risk Reduction and Management Plan (Philippines)
NEDA	National and Economic Development Authority (Philippines)
NGO	Non-Governmental Organization
ODA-GAD	Official Development Assistance - Gender and Development Network
OECD	Organization for Economic Cooperation and Development
PCW	Philippine Commission on Women
PHIVOLCS	Philippine Institute of Volcanology and Seismology
REDAS	Rapid Earthquake Damage Assessment System
SDMP	State Disaster Management Plan (Himachal Pradesh, India)
SFDRR	Sendai Framework for Disaster Risk Reduction
SNGRD	Sistema Nacional de Gestión del Riesgo de Desastres (National DRM System) (Colombia)
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGRD	Unidad Nacional para la Gestión del Riesgo de Desastres (National DRM Unit) (Colombia)
UNISDR	United Nations Office for Disaster Risk Reduction
UNISDR GETI	Global Education and Training Institute
WCDRR	UN World Conference on Disaster Risk Reduction
WIA	Words into Action

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INTRODUCTION

1.1. ABOUT THE GUIDEBOOK

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) charts the global course on disaster risk reduction (DRR) matters over the next 15 years. It defines a set of targets and indicators to monitor progress and achievement nationwide and locally. Specifically, target E calls to "substantially increase the number of countries with national and local disaster risk reduction strategies". Drawing from consultations and discussions, and with the aim of providing practical guidance to support the implementation of the new framework, the United Nations Office for Disaster Risk Reduction (UNISDR) introduces Words into Action (WIA) guidelines on selected topics. Local disaster risk reduction and resilience strategies is one of them.

The aim of this guidebook is to advise local governments (authorities, planners and managers at city or other subnational levels) on developing and implementing a holistic and integrated local DRR strategy that contributes to building resilience at the local scale and that accommodates to a national strategy whenever one is in place. It outlines what a local DRR and resilience strategy should look like and what is needed to create and implement one. Local strategies, while aligned with their national counterparts, are generally more specific. They reflect the local context and hazard profile and tend to concentrate on the planning and implementation phases, clearly assigning roles and responsibilities at the subnational level.

One of the framework's core concerns is that more dedicated action needs to be focused on tackling underlying disaster risk drivers and strengthening good governance in DRR strategies at all levels and across sectors and institutions. While its predecessor, the Hyogo Framework for Action (HFA), focused on disaster losses, the Sendai Framework concentrates on disaster risk.

Today, there is a consensus that disaster risk reduction (DRR) should be mainstreamed into the general development process (including economic, social, territorial, environmental and infrastructure development) aiming for sustainable development. However, in practice, linking DRR with development has been challenging. Current development pathways tend to increase disaster impacts as will anthropogenic climate change. Discussion around underlying risk drivers and their connection to development has been slow in permeating global agreements and national policies and plans. The Sendai Framework highlights this as one of the areas where less progress has been made and greater efforts are required.

The guidebook is intended for local governments, as it usually falls within their responsibilities to ensure local development and to manage disaster risk so that it does not undermine development. They must develop and enforce the regulatory frameworks under which other stakeholders contribute, collaborate and engage in the local development process, including formulating DRR and resilience strategies. Acknowledging multiple forms of government organization across the world, this guide broadly refers to local governments as the lowest political-administrative jurisdiction which is accorded the mandate for disaster risk reduction. The Sendai Framework encourages the design and implementation of local DRR strategies by every local authority and traces progress based on the number of local governments with DRR strategies vis-à-vis the total number of local governments in a country. Compared with national strategies, local DRR strategies are far more heterogeneous, vary across countries and local administrative units, and change over time.

Exploring a diversity of resilient pathways, the guidebook moves across different scales of "localness" and identifies various entry points to the subnational level – from the micro scale of neighbourhoods and districts, to the city and metropolitan scale. It is through the collective practice and realization of actions undertaken at the ward, *barangay, barrio* or neighbourhood level that local realities are transformed and changes triggered at upper levels. Actions and policies implemented at the city or metropolitan scale also support and guide transformative trajectories at the micro level. It is the job of each local DRR and resilience strategy to delineate the best way forward.

BOX 1

The difference between a strategy and a plan

A local disaster risk reduction and resilience strategy is a planning tool that defines general goals and objectives across different timescales, considering the short- and mid-term while simultaneously embracing a long-term perspective. It provides a common vision and includes certain guiding principles and priorities. It aims to prevent the creation of (new) risks, reduce existing risks, recover from realized risks and strengthen economic, social, health and environmental resilience. It needs to incorporate certain flexibility and periodic evaluation mechanisms to adjust course, evolve and adapt to changing circumstances, while continuing to provide DRR guidance.

A local disaster risk reduction plan provides operational guidance for implementing the strategy. It sets out the specific goals and objectives for reducing disaster risks, together with related actions to accomplish them. A disaster risk reduction plan goes into more detail by specifying timeframes, defining responsibilities and the sources of funding. It also outlines indicators and mechanisms for monitoring progress. Linkages to sustainable development and climate change adaptation plans should be made whenever possible.

Both the strategy and the plan should be coherent with the Sendai Framework for Disaster Risk Reduction 2015-2030. Likewise, the alignment of local DRR strategies to their national DRR counterparts (whenever they are available) is considered imperative. The development of a strategy requires the commitment and involvement of political leadership across levels of government and sectors in a multi-hazard approach.

1.2. ORGANIZATION OF THE GUIDEBOOK

The main body of the guidebook is complemented with multiple resources. At the end of each section, the guideline provides suggestions for further exploring specific aspects, useful tools to put in practice some of the recommendations and additional literature for those interested in the topic. Similarly, guiding questions for local authorities, planners and managers are strategically placed across the chapters to provide the reader with a space for reflection. The complete list of questions is compiled in Annex II. Finally, vignettes of case studies are included to illustrate the main recommendations and to highlight best practices. Details of each case study are consolidated in Chapter 6.

THIS GUIDE IS DIVIDED INTO SEVEN CHAPTERS:

01 Introduction

02 Highlights the role of subnational levels in developing local disaster risk reduction and resilience strategies and the importance of localizing DRR

03 Delineates the main characteristics of a local disaster risk reduction and resilience strategy

04 Introduces the enabling factors that generate the conditions for its development throughout an inclusive and participatory process

05 Elaborates on the three core elements that aid in implementing a local disaster risk reduction and resilience strategy, namely:
1) organizing for disaster risk reduction and resilience;
2) knowing and understanding current and future risks
3) having financial resources to be able to plan and act

06 Includes a selection of case studies exemplifying some of the main themes covered in the guide.

07 Highlights the role of subnational levels in developing local disaster risk reduction and resilience strategies and the importance of localizing DRR

1.3. BACKGROUND

Disaster risk is directly linked to broader development problems. Underlying risk drivers, such as poverty and inequality, poor living conditions, unplanned urbanization processes, environmental degradation and lack of regulations and enforcement, can and should be addressed by "good development" practice at all levels and across all sectors. Having access to basic infrastructure and services (including risk-reducing infrastructure and services, good quality housing in safe locations, secure tenure and income and livelihood opportunities) reduces exposure and vulnerability and therefore risk.

Reducing disaster risk is about addressing basic development that helps build "accumulated resilience" and preparing for and mitigating disasters. It also entails ensuring adequate governance – that is, transparent, accountable and representative decision-making structures – so that everyone's needs and voices are considered and development gains benefit all. Thus, connecting DRR with broader development processes contributes to advance a people-centred risk reduction approach.

Success in achieving greater resilience also depends on the competence and capacity of local governments to advance and sustain locally rooted development processes and goals that integrate DRR and climate change mitigation and adaptation. It requires learning about changing risks and opportunities, identifying and evaluating options, making decisions and revising strategies in collaboration with a range of actors, particularly those most at risk. It needs the focus to be on what must be done, but more importantly on how, by whom and with what support. Finally, it requires national governments and international agreements that are supportive of local work.

The Sendai Framework calls for the coherent implementation and reinforcement of actions and commitments of different international agreements adopted in 2015-2016, namely: the Sendai Framework itself; the Addis Ababa Action Agenda (AAAA) on Financing for Development; Transforming Our World: the 2030 Agenda for Sustainable Development; the Paris Agreement on Climate Change; and the New Urban Agenda resulting from the United Nations Conference on Housing and Sustainable Urban Development (Habitat III).

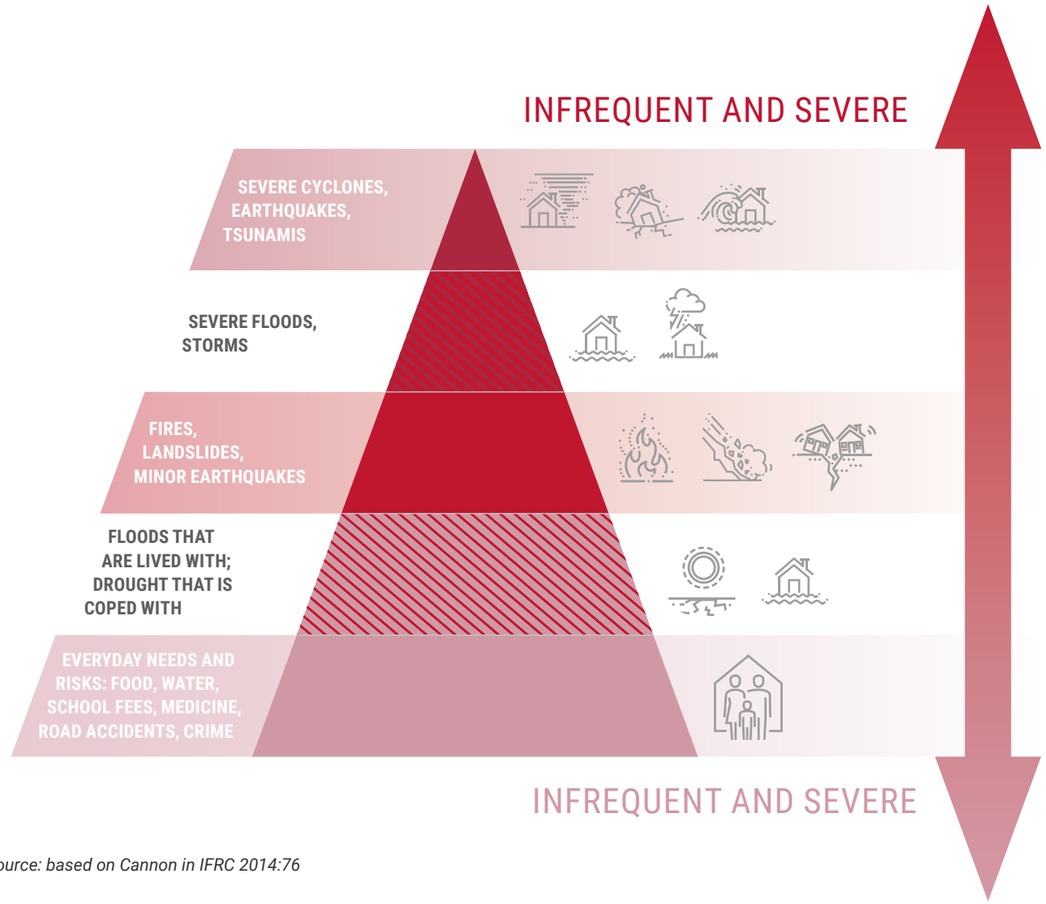
The Sendai Framework is the successor of the Hyogo Framework for Action 2005-2015 (HFA). While the new framework acknowledges that good progress has been made in raising awareness, generating political commitment and catalysing actions by a wider range of stakeholders, it also highlights that more still needs to be done. In this context, the Sendai Framework represents a transition from understanding the interactions between hazard, exposure and vulnerability to a greater concern with how to act upon these risk factors through prospective, corrective and compensatory measures. This has motivated greater attention to the role of local governments and the relevance of the local level.

Globally, disasters continue to cause a heavy toll of death, injury and economic loss due to high levels of exposure and vulnerability, particularly in relation to urbanization and globalization processes. Tackling underlying disaster risk drivers and promoting transformative development must therefore become a priority. This entails serious questioning of how DRR has been approached thus far, at all levels and by all sectors, and a better understanding that disasters (and climate change) are not externalities to be reduced but intrinsic characteristics of current development pathways. In its most progressive form, DRR should go beyond protecting development gains and addressing current risks, and rather propose new models of development that are environmentally sustainable and socially just and can thus reduce future risks.

DRR involves considering and managing a wide range of risks, from the frequent and small-scale risks associated with everyday life (extensive risk) to the infrequent and larger scale risks related to extreme events (intensive risk). It can be an entry point to simultaneously advancing DRR, climate change adaptation and sustainable development.

FIGURE 1

DRR is about considering and managing a wide range of risks



Source: based on Cannon in IFRC 2014:76

BOX 2

Defining climate change

"Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use" (UNISDR 2015b:9).

Past climate-related risk patterns and trends may be poor predictors of future risks and cities need to plan ahead for this: "Changing climate leads to changes in the frequency, intensity, spatial extent, duration and timing of extreme weather and climate events and can result in unprecedented weather and extreme events" (IPCC 2012:7). Changes in extremes can be linked to changes in the mean, increased variability, or a combination of both. Therefore, addressing present local risks needs to be integrated with forward-thinking measures to reduce future risks. Most disasters that could happen have not happened yet.

Global target E of the Sendai Framework highlights the role of local authorities and the local level in achieving DRR. The target is to substantially increase the number of countries with national and local disaster risk reduction strategies by 2020. The efforts of UNISDR and its partners to emphasize the importance of subnational levels, in general, and cities, in particular, in DRR and building resilience, can be traced back to the launching of the UNISDR Making Cities Resilient campaign in 2010.

The overall aim of Making Cities Resilient is "to support sustainable urban development by promoting resilience activities and increasing local level understanding of disaster risk" (http://www.unisdr.org/campaign/resilientcities/). The campaign initially focused on raising awareness and advocacy, but, aligned with the Sendai Framework and the Sustainable Development Goals (2015), it now aims to advance implementation. To do so, the campaign has developed a set of guidance documents, toolkits and assessment tools. The Ten Essentials for Making Cities Resilient is a key tool allowing local governments to track progress against a checklist of activities and to evaluate their commitment towards building resilience. The Ten Essentials aim to assist local governments in establishing DRR and resilience strategies that also consider future risks and uncertainties and in highlighting areas of strength and key challenges. All in all, the campaign promotes a set of principles for DRR that makes sense for local development and addresses issues that are important for local governments and urban residents.

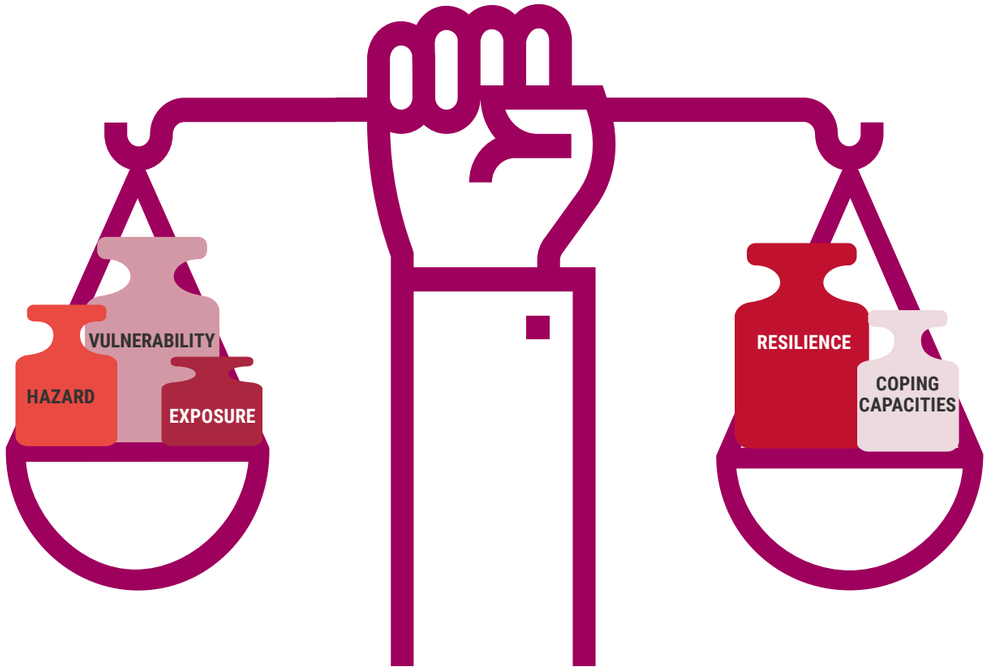
[See Appendix I: Sendai priorities for action, Ten Essentials and what they mean at the local level]

1.4. TERMINOLOGY USED IN THIS GUIDE AND DEFINITION OF KEY CONCEPTS

In order to develop and implement a local disaster risk reduction and resilience strategy, DRR should be mainstreamed into all the key functions that local authorities regularly undertake, involving different sectors and stakeholders. This means considering DRR in land use and urban development planning and management, infrastructure and service planning, construction and building codes, social welfare, environmental management, health, education and finance.

Disaster risk is 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.

DISASTER RISK



Hazard is 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.

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

Vulnerability refers to 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.

Coping capacity is the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters.

Resilience is the ability of a system, community or society that is exposed to hazards to resist, absorb, accommodate 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. It means the ability to "bounce" or "spring" back from a shock. The idea of "springing back" should pay special attention to not reproducing the conditions of vulnerability that triggered the disaster in the first place, building back better and safer and pursuing transformational change. Resilience can be built when citizens and the institutions that serve them take action to build a culture of prevention and/or safety in a broad sense.

Underlying risk drivers refer to processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity. These include poverty and inequality, climate change and variability, unplanned and rapid urbanization and the lack of disaster risk considerations in land management and environmental and natural resource management. They also include compounding factors such as demographic change, non-disaster risk-informed policies, lack of regulations and incentives for private disaster risk reduction investment, complex supply chains, the limited availability of technology, unsustainable uses of natural resources, declining ecosystems and pandemics and epidemics. These are also referred to as **underlying disaster risk factors**.

Disaster risk governance encompasses the system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy.

Disaster risk reduction is the policy objective of disaster risk management aimed at preventing new and reducing existing risk and managing residual risk, all of which contribute to strengthen resilience.

Disaster risk management is the application of disaster risk reduction policies, processes and actions to prevent new risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

Disaster management is the organization, planning and application of measures preparing for, responding to and recovering from disasters. Managing disaster risk requires a combination of three areas of practice:

- **Prospective risk management**: activities that address and seek to avoid the development of new or increased disaster risks. It focuses on addressing disaster risks that may develop in the future if disaster risk reduction policies are not put in place. It includes: better land-use planning; climate-proofing infrastructure and services and making them more resistant to weather extremes; and innovation to serve multiple purposes (e.g. drainage systems that integrate the use of water retention systems and green infrastructure, combined with better storm drains and sewage systems, to reduce climate-related and health risks).
- **Corrective risk management**: activities that address and seek to remove or reduce existing disaster risks. Examples are the retrofitting of buildings and critical infrastructure or the relocation of exposed populations or assets. It includes reducing social and health vulnerabilities through better housing, access to safe land and addressing deficits in basic infrastructure and services (e.g. water, sewage and storm-water drains). It can also mean introducing dams, levees and slope stabilization measures.
- **Compensatory risk management**: activities to strengthen the social and economic resilience of individuals and societies in the face of residual risk that cannot be effectively reduced. It involves preparedness, response and recovery activities, but also a mix of different financing instruments, such as national contingency funds, contingent credit, insurance and reinsurance, and social safety nets.

A comprehensive disaster risk management approach can contribute to climate change adaptation, climate change mitigation and to a sustainable future.

FIGURE 2

Links between DRM areas of practice, climate change and sustainable development

	PROSPECTIVE	CORRECTIVE	COMPENSATORY
DISASTER RISK MANAGEMENT	Risk avoidance	Risk mitigation/reduction	Strengthening resilience to disaster (both financial and social resilience)
CLIMATE CHANGE	Climate change mitigation	Climate change adaptation	Strengthening resilience to extreme events associated with climate change
SUSTAINABLE DEVELOPMENT	Contributing to future sustainable development	Increase the sustainability of existing development conditions	Strengthening resilience to everyday risks and shocks

Source: UNISDR 2015a:18

EXPLORE MORE

Sendai Framework for Disaster Risk Reduction (2015)
http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

Paris Agreement on Climate Change (2015)
http://unfccc.int/paris_agreement/items/9485.php

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

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

Addis Abeba Action Agenda (2015)
http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf

USEFUL TOOLS

Ten Essentials for Making Cities Resilient
http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=1

How to make cities more resilient: a handbook for local government leaders
https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/Handbook%20for%20local%20government%20leaders%20%5B2017%20Edition%5D.pdf

Terminology on DRR
https://www.unisdr.org/we/inform/publications/51748

Local Government Powers for Disaster Risk Reduction
https://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=27

FURTHER READING (SEE REFERENCES SECTION)

IFRC 2010; IFRC 2015; IPCC 2012; IPCC 2014; Lavell & Maskrey 2014; Pelling 2011a; UNISDR 2009; UNISDR 2011; UNISDR 2012; Wamsler 2014

02

FOCUS ON THE LOCAL LEVEL

2.1. RELEVANCE OF THE LOCAL SCALE

Disaster risk is context specific. It is experienced in particular places and times, in ways that shape local patterns of exposure, vulnerability, adaptive capacities and resilience. Risk profiles may change over time and the local scale is where these changes are more directly perceived, and action is taken. Thus, it is centrally important that local actors, such as local governments (politicians and civil servants), the private sector, NGOs, community-based organizations and representatives of vulnerable groups, take part in DRR processes and consolidate development pathways that include DRR.

The importance of localizing DRR relates to a series of factors:

- Impacts of disasters are most immediately and intensely felt at the local level.
- Hazards usually occur locally and many of the most effective tools to reduce exposure to hazards – e.g. land-use regulations and enforcement of building codes – are at the local level.
- The local level is where the basic environmental management and regulatory governance functions that are essential for effective DRR are concentrated.
- It is at the local level where governments and communities can best engage with each other and work together.
- Local DRR goes hand-in-hand with the promotion of local development management and local environmental management.
- Local actors are the first responders should a disaster occur, hence feedback and adjustments can be adopted and implemented more quickly and according to the specific context.

It is worth noting that local DRR is not limited to the municipal political-administrative boundaries. As mentioned in the introduction, we include in this guidebook different scales of "local", with highly heterogeneous characteristics and capacities, from the micro to the metropolitan, aiming to give the reader examples of alternative scales of action. Sometimes actions tend to be very localized, but with time they scale up and inform upper levels. At other times, several administrative units that have responsibility over a territory get together to develop a local DRR and resilience strategy.

More and more, the metropolitan or city-region scale is gaining relevance in terms of development planning. To this end, supra-local authorities and agencies are formed to coordinate between municipalities, cities and local governments. Similarly, applied research on experimentation for climate change adaptation is increasingly taking place at the district, neighbourhood or block level. However, there are reasons why the municipal scale (and the city, municipal or local government) is so relevant for local DRR, namely:

- DRR requires relatively consolidated and sustainable organizational and institutional structures.
- Local governments are the "first port of call" for citizen concerns on risk and vulnerability and therefore can face intense pressure to act.
- Local governments bear the ultimate responsibility for the safety of their citizens and communities.
- Local governments are in charge of promoting local development and therefore offer a real option for linking DRR with development.
- Local governments have normative and control responsibilities.

2.2. WHY CITIES AND URBAN AREAS?

Economic losses from disasters continue to rise across the world. They are increasing faster in OECD countries, but the impact of economic losses relative to GDP in low and middle-income countries is much higher and thus threatens their economies more. Moreover, low and middle-income nations show a rising trend in mortality and economic losses associated with extensive disaster risks.

The increase in exposure (of people and economic assets) and the rise of economic losses associated with disaster events (particularly extensive disasters) goes in tandem with the way urbanization processes unfold. Urban areas have often expanded into locations where populations and assets are increasingly exposed to hazards and, sometimes, high degrees of social inequality, informality, poverty and insecurity that further aggravate the underlying risk drivers.

By 2018, 55% of the world's population was living in urban areas and this proportion is expected to rise to 68% by 2050 (UNDESA 2018). As the world's population becomes increasingly urban, disaster risk predominantly concentrates within cities and urban areas of all sizes, economic characteristics and locations. The concentration of people, assets and activities in urban centres usually generates new patterns of hazard, exposure and vulnerability. Approximately 60% of the area to be urbanized by 2030 has yet to be built. This will happen mostly in countries and urban centres with low capacity to ensure risk-reducing infrastructure and services. It represents an opportunity to reduce disaster risk globally.

How cities develop shapes disaster risk, and disaster risk shapes development possibilities. Cities are usually described both as risk (a cause of risk) and at risk (affected by risk). However, as this guidebook makes clear, well-governed cities can also reduce risk. Cities and urban areas concentrate population, economic activities and built environments in ways that the economies of scale or agglomeration can allow for better provision of risk-reducing infrastructure. They can be safe places, if good quality housing, infrastructure and emergency-response services are in place and work for all. Ideally, for each city, there should be a long-term strategy to guide urbanization and urban growth, but often this has not been the case. In many urban centres in high, middle and low-income nations, local governments have been unable to manage the physical expansion of cities, provide basic services and infrastructure, ensure social integration, and guide urban change in ways that reduce vulnerability and exposure to hazards. Different city-to-city platforms exist to help boost the opportunities cities and urban areas offer, and to encourage the exchange of good practices and co-learning towards a more sustainable and equitable urban future. The Making Cities Resilient campaign places cities in the spotlight, with 4,080 signatory cities as of October 2018. Other initiatives include the Rockefeller Foundation 100 Resilient Cities, C40, ICLEI Local Governments for Sustainability and United Cities and Local Governments.

EXPLORE MORE

UNDRR Making Cities Resilient campaign
www.undrr.org/campaign/resilientcities/

100 Resilient Cities
http://www.100resilientcities.org

C40
http://www.c40.org

ICLEI Local Governments for Sustainability
http://www.iclei.org

United Cities and Local Governments
https://www.uclg.org

FURTHER READING (SEE REFERENCES SECTION)

IFRC 2010; IPCC 2014; Romero-Lankao & Dodman 2011; Satterthwaite 2016; UN-HABITAT 2011; Wamsler 2014

2.3. DECENTRALIZATION

Decentralization is a political and technical process generally described as involving a shifting combination of political, fiscal and administrative authority between layers of government. There are various types of decentralization and the related processes are carried out differently across countries. It is often the case that a combination of different types of decentralization operates within a country and changes over time.

Ideas about decentralization have been receiving greater attention in international and national agendas. In many countries, these have been backed up with new legislation that gives local authorities greater autonomy regarding local development, but also greater obligations. Many responsibilities, including the responsibility for DRR, have been delegated to the municipal level. The decentralization wave is underpinned by the assumption that better choices can be made to respond to local needs, and greater transparency and accountability can be achieved at the local level since decision makers and citizens are closer together. In many cases, however, decentralization has been taken forward with different depths and without the actual transfer of financial and human resources – and even less – decision-making powers. With some exceptions, there has been little effort to strengthen local capacities. It is often the case that only the better-positioned cities – in terms of financial resources, staff, political commitment and a strong civil society – have been able to fully undertake the delegated responsibilities, including those of DRR. Many signatory cities of the Making Cities Resilient campaign have managed to assume DRR responsibilities, although with widely varying depth and breadth.

Decentralization is a challenge for both national and local authorities. To meet this challenge, not only adequate legislation should be passed but also the required support to comply with regulations must be in place.

USEFUL TOOLS

Global Observatory on Local Democracy and Decentralization (GOLD)
http://www.gold.uclg.org

FURTHER READING (SEE REFERENCES SECTION)

Johnson & Blackburn 2014; Scott & Tarazona 2011; UNISDR 2012; UNISDR 2015c UNISDR (2017b)

BOX 3:

Broad categories of decentralization

Deconcentration or administrative decentralization is when the functions performed by central government are implemented by geographically distinct administrative units whose services are funded by centrally assigned resources. The units remain accountable to the central authorities.

Devolution or political decentralization (sometimes referred to as democratic decentralization) is when powers and responsibilities are devolved to elected local governments that are then able to make decisions on an array of public issues and gain access to resources to fund actions accordingly. This is considered the most complex and far-reaching form of decentralization.

Fiscal decentralization is required by political decentralization and entails the transfer of financial resources in the form of grants and tax-raising powers to subnational units of government.

Source: Scott, Z. and Tarazona, M. (2011).

03

DEFINING LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES

A local disaster risk reduction and resilience strategy is the planning tool to integrate and mainstream a DRR approach within local development. It starts by delineating a common vision of the understanding of disaster risk, followed by the definition of guidelines and priorities to prevent the creation of new risk, reduce existing risk, recover from disasters and strengthen economic, social, health and environmental resilience. The strategy guides the development of coherent local plans and actions. That is, it is a starting point and defines a working approach. It is developed with a long-term perspective but simultaneously incorporates certain flexibility and periodic evaluation mechanisms to capitalize learning and accommodate to changes within complex global processes.

When thinking about a local DRR and resilience strategy, it is important to consider two elements. In the first place, the process of strategy making, where the vision of the local area or city and its relation to disaster risks is discussed and negotiated between different local actors. In the second place, the strategy itself: the tangible (and usually written) product that results from the strategy-making process. This tangible product, which might take different forms, should delineate the ways to incorporate disaster risk reduction permanently and organically into development planning. It is worth noting that the process is as important as the outcome, since it offers an opportunity for DRR to be appropriated and rationalized by the different local/urban actors. This is a necessary condition if DRR is to be truly incorporated in the everyday planning and development of the local area or city.

The local strategy is built collectively. Local leaders need to facilitate an enabling environment so that all actors can contribute to the strategy-making process and support its implementation. Local leaders should also promote the creation of a team, which can be small, to integrate visions and priorities, coordinate activities and follow up on the process. Members of this team should have time to coordinate planning and participation, rather than being tied to the everyday demands of residents. Furthermore, it is key that the strategy builds upon existing processes, projects and activities, while developing a unified agenda that supports DRR and resilience.

A local disaster risk reduction and resilience strategy has sustainable development as a guiding principle. It encourages policies and plans to take into consideration the benefits and thresholds of the environment, economy and society, balancing today's needs with those of future generations. Thus, a local strategy weaves DRR into development, and managing risks – rather than managing disasters – becomes inherent to the process of development. In so doing, managing risks recognizes the direct relationship between functioning infrastructure and services, access to safe land and housing, environmental sustainability, access to employment and livelihood possibilities and equity. Mainstreaming DRR into the operations and development activities of local governments and other actors can contribute to reducing disaster impacts much more effectively and sustainably than isolated, sectoral actions.

To summarize, a local DRR and resilience strategy should have:

- A shared vision of the city and understanding of DRR;
- A designated focal point with a core team, with capacity to work with different actors, leading and coordinating the strategy-making process and ensuring its implementation;
- A budget, some in the form of a dedicated budget for core team activities, with other funds allocated from different offices and departments, but clearly earmarked as contributing to the strategy;
- A timeframe to fulfil the elaboration of the strategy and its implementation through an action plan. Activities might include: working meetings with various actors, preparation of a baseline document, outline of roles and responsibilities of different actors involved in the process, presentation and follow up of the strategy and elaboration of a DRR action plan.
- As mentioned in chapter 1, a local DRR and resilience strategy must be aligned with the Sendai Framework for Disaster Risk Reduction 2015-2030.

BOX 4

Ten key elements DRR strategies should have to align with the Sendai Framework

DRR strategies should:

I. Have different timescales, with targets, indicators and time frames;

II. Aim at preventing the creation of risk;

III. Aim at reducing existing risk;

IV. Aim at strengthening economic, social, health and environmental resilience;

V. Address the recommendations of framework Priority 1: Understanding disaster risk, based on risk knowledge and assessments to identify risks at the local and national levels of the technical, financial and administrative disaster risk management capacity;

VI. Address the recommendations of Priority 2: Strengthening disaster risk governance to manage disaster risk. Mainstream and integrate DRR within and across all sectors with defining roles and responsibilities;

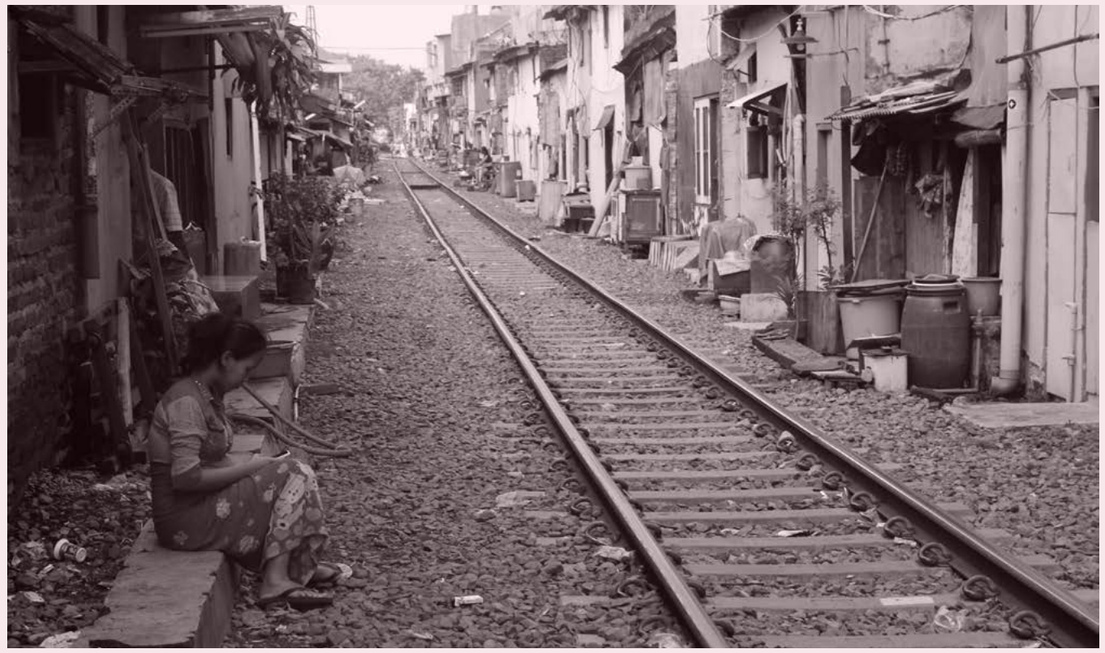
VII. Address the recommendations of Priority 3: Investing in disaster risk reduction for resilience, which guides the allocation of the necessary resources at all levels of administration for the development and the implementation of DRR strategies in all relevant sectors;

VIII. Address the recommendations of Priority 4: Enhancing disaster preparedness for effective response and to "build back better" in recovery, rehabilitation and reconstruction. Strengthen disaster preparedness for response and integrate DRR response preparedness and development measures to make nations and communities resilient to disasters;

IX. Promote policy coherence relevant to disaster risk reduction, such as sustainable development, poverty eradication and climate change, notably with the SDGs and the Paris Agreement;

X. Have mechanisms to follow-up, periodically assess and publicly report on progress.

Source: UNISDR (2017c:115 –116)

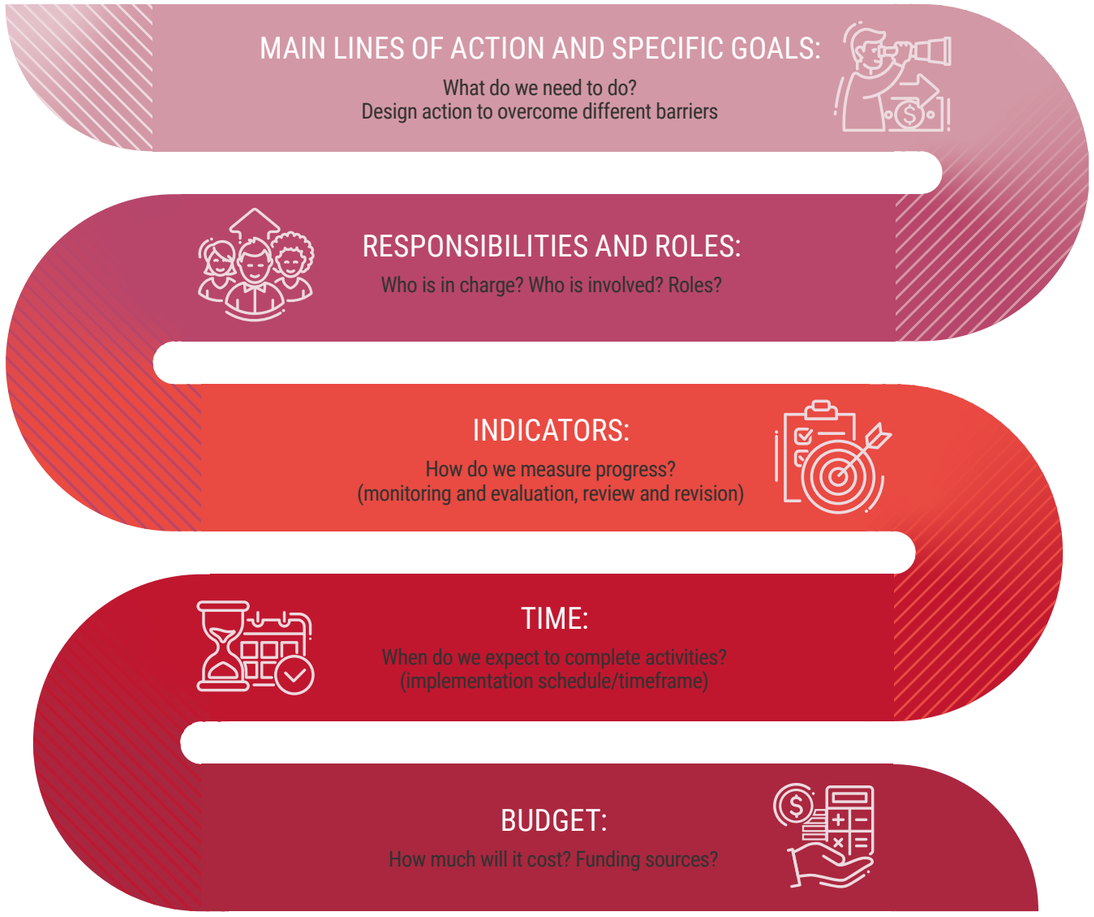


Once local actors agree on a shared vision of the city, its risks and how they relate to sustainable development and resilience building, the operationalization of the strategy takes place through the elaboration and implementation of local action plans. UNISDR, through the Making Cities Resilient campaign, offers a set of tools and training options to help develop local action plans. Among these, the Scorecard and the training modules facilitated by the Global Education and Training Institute (UNISDR–GETI) stand out. Structured around the UNISDR's Ten Essentials, the scorecard is offered in two versions: a preliminary and a detailed assessment. Both tools allow local governments to monitor and review progress and challenges in the implementation of the Sendai Framework, assess their disaster resilience and identify gaps in management capacities. They also support local governments in developing the city DRR action plan, especially when deploying the detailed version of the scorecard. [See section 4.2 for details on these specific tools]

AN ACTION PLAN ADDRESSES THE FOLLOWING QUESTIONS:

FIGURE 3

Guiding questions for drafting local DRR and resilience action plans



Source: Authors' elaboration

Once the plan is developed, it should be presented to a governing authority (such as the mayor, disaster risk management (DRM) committee or city council) to receive formal authorization for implementation. It should also be presented publicly to local actors to convene involvement, support and ownership.

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **Should the DRR and resilience strategy-making be an exclusive and isolated process or rather be integrated in the local development plan-making process of your local area/city?**
- **Does the local DRR and resilience strategy need to be discussed separately or should it rather be part of a broader discussion about the vision of your local area/city?**
- **These questions stress the need to find a balance between the SPECIFIC and the CROSS-CUTTING nature of DRR. How you answer these questions will define the organizational structure for DRM.**

FURTHER READING (SEE REFERENCES SECTION)

Baker 2012; da Silva et al. 2012; UNISDR 2009

04

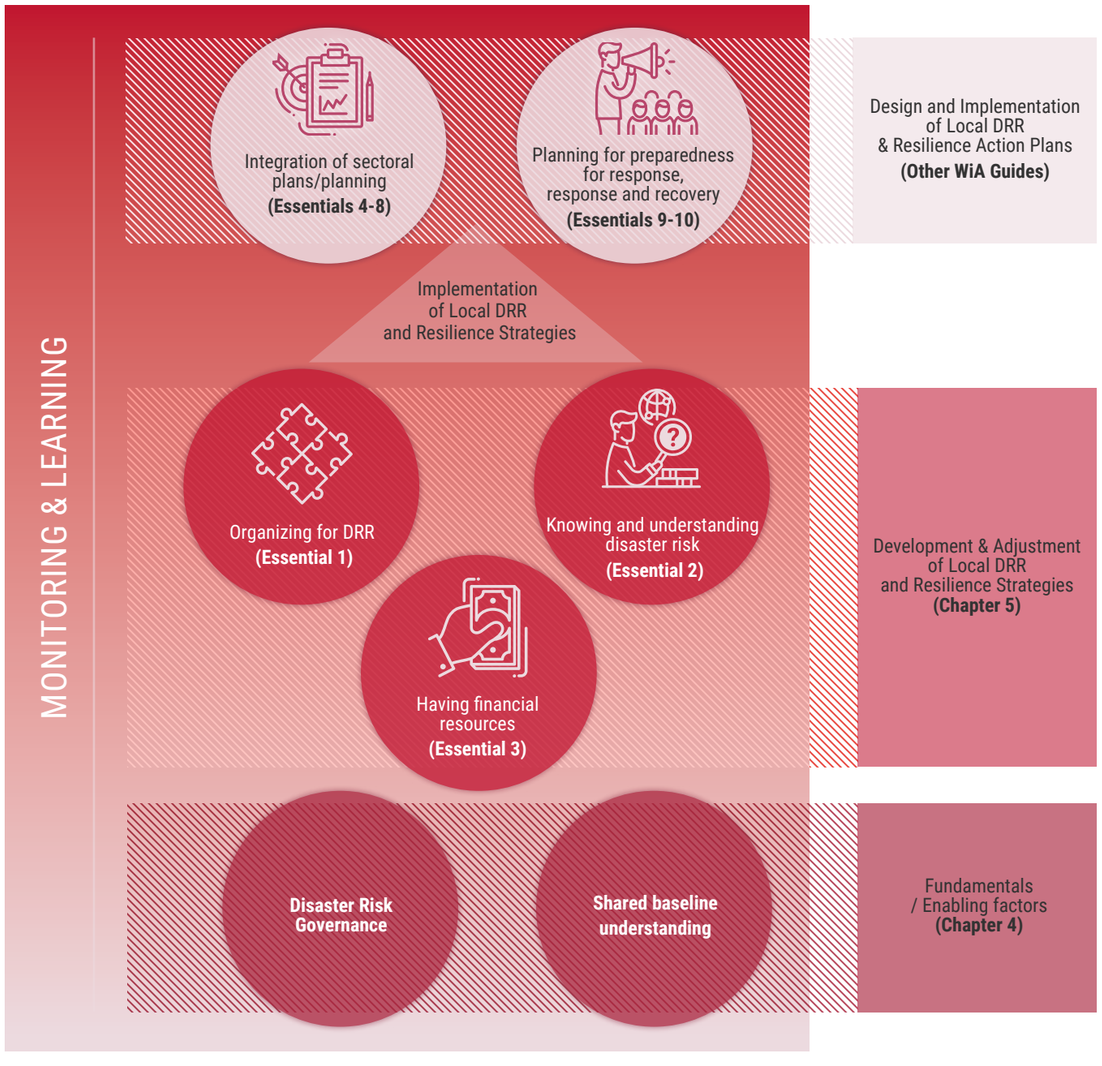
ENABLING FACTORS FOR LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES

There are certain factors that help generate the conditions for developing and implementing a local disaster risk reduction and resilience strategy through an inclusive and participatory process, responding to local needs and enabling the appropriation and acceptance of the strategy by all local/urban actors.

This section introduces the enabling factors, while section 5 elaborates on the development and adjustment of the strategy. Implementation of the DRR and resilience strategy through sectoral plans, on the one hand, and response and recovery plans, on the other, is not covered in this guide. There are other Words into Action guidebooks that specifically address the implementation/operational phase and therefore complement the present guide.

FIGURE 4

Enabling factors, development and implementation of local DRR and resilience strategies



4.1. DISASTER RISK GOVERNANCE

There is a shared understanding that governments alone cannot deal with DRR or any other complex development issue. All actors – from national to local governments, civil society organizations, academics, professional associations, the private sector, international donors and each and every citizen – have a role to play in the decision-making, planning and implementation process of DRR. With varying capacities and degrees of responsibility, they all need to engage in reducing disaster risks and contribute to building disaster resilience in their local areas. However, in order to do so, roles and responsibilities need to be clearly defined.

Governance implies that governments do not make decisions in isolation but rather negotiate policies and practices with those who are part of or affected by their decisions. Disaster risk governance affects the distribution of exposure and vulnerability, and therefore of disaster risk, among different groups of people. It is well recorded that those who do not have a voice and whose rights are not recognized are at a higher risk of death, injury and loss of property. Good disaster risk governance needs to promote participation and recognition to address the underlying risk drivers that result in differentiated disaster impacts according to age, ethnicity, religion, gender, labour conditions, land ownership, economic status and disabilities (physical, psychological and cognitive).

Good governance also entails improving accountability, transparency and meaningful participation throughout the procedures and practices. Negotiating, building consensus and reaching agreements comprise both formal and explicit mechanisms (legislation, policies, standards and administrative procedures) and informal and implicit agreements that mediate social, economic and political relations. In places where there is a proactive, responsive and accountable local government that works with local actors, the possibilities of resilience are much higher. By contrast, weak accountability entails greater room for corruption. Indeed, corrupt practices are known to be a major risk factor.

FURTHER READING (SEE REFERENCES SECTION)

Aysan & Lavell 2014; Betsill and Bulkeley 2006; Cannon 2008; Coskun 2013; Corfee-Morlot et al. 2009; Djalante, Holley and Thomalla 2011; Djalante 2012; IFRC 2015; Johnson 2011; Manuel-Navarrete et al. 2011; Satterthwaite 2011; Twigg, Kett & Lovell 2018; UNISDR 2011; UNISDR 2015a; Wilkinson et al 2014

4.1.1. LOCAL GOVERNMENTS LEADING THE PROCESS

Political will and leadership are key to develop a DRR and resilience strategy. These usually come with a better understanding of the concept and practice of DRR, together with capacity for convincing other civil servants and decision makers of the need for a holistic approach in development planning.

Much DRR falls within local or city government responsibilities, since they are at the front line of DRR. It is the local, municipal or metropolitan government, working with other relevant actors, that usually leads the DRR process. At least three reasons justify this leading role:

1. It is the legally constituted entity responsible for local development and land-use planning, with the authority to sanction norms, incentives and controls.

2. It is the legal and democratically elected representative of different sectors, actors and social forces, and hence the natural arena for the resolution of conflicts.

3. It links local with regional and national levels as it usually has political representation at regional and/or national scales.

FURTHER READING (SEE REFERENCES SECTION)

Lavell 2003a; Lavell 2003b; UNISDR 2017

4.1.2. ENGAGED COMMUNITIES

Governments alone cannot address DRR. Every DRR success story involves planning and implementation that give importance to community or civil society involvement. In some cases, it is local governments leading the process of disaster risk reduction and resilience building. In many others, though, communities themselves take the lead in disaster risk reduction. Communities are a central actor as they inhabit the territory, whereas the involvement of practitioners and politicians is usually temporary. Therefore, the development of a local DRR strategy needs to be tuned to the needs and timeframes of communities, which are usually different from those of politicians, consultants or academics.

Alone or with the support of NGOs, academia and/or the private sector, engaged communities enable priorities to be better defined and actions planned, responding to real (mostly local) needs and concerns and bringing about long-term change. When local citizens and communities have a voice, they can get involved in decisions that will later affect them. Community involvement is not only about tapping local risk knowledge and communities' resourcefulness. It is also about understanding how communities make choices according to their opportunities and constraints. It is often community organizations themselves that can best manage collective responses suited to particular contexts and situations. It is also their networks and support systems that bring innovation to development processes.

At the same time, it is important to acknowledge that there are limits to community-driven processes. Communities themselves do not have control over issues such as land tenure or the formulation of public policies. Hence, the institutionalization of community-driven processes at the local level needs the support of local governments. It is also worth noting that communities are not homogenous. Within each community there are usually unequal distributions of exposure and vulnerability, and therefore risk, with internal power structures, divisions and tensions that are important to unveil and address.

4.1.3. INVOLVEMENT OF OTHER ACTORS

Universities and local NGOs can play a key role as intermediaries between local governments and communities. They can act as facilitators during negotiation and consensus-building processes between different local/urban actors. This is especially the case when there is mistrust between actors involved in the process. Universities and NGOs can monitor local government's actions and push for accountability. They can also play a crucial role in the construction and dissemination of knowledge around DRR and help build risk assessments and profiles, integrating themes and engaging a wider range of actors.

The private sector has a central role to play in guiding and financing the expansion and growth of urban areas. Developers, construction companies and real estate offices influence the location of investments, generate employment opportunities and expand services in these areas. Similarly, commercial, industrial and service companies represent an important share of those assets exposed to disaster risk. Directly or indirectly, they all affect where urban residents live and work, so it is essential that they understand DRR measures and the benefits of reducing present and future risks. Different instruments, including regulations and control mechanisms, as well as incentives for risk-aware investments and risk-sensitive development, are crucial for orienting the decisions and actions of these actors. The private sector is also engaged in developing tools for systematizing information and improving decision-making, and there are examples of partnerships between companies and local governments. Insurance and re-insurance companies and financial institutions play an active role by providing financial compensatory mechanisms and creating catastrophe bonds and funds to facilitate reconstruction.

SEE SECTION 6 - **CASE STUDY 1**
The Making Smart Cities initiative offers an example of collaboration between the state and the private sector in Campinas (Brazil)

The international community plays a central role in setting the global agenda, defining priorities that incorporate new themes or re-framing long-standing issues. It does so via two important mechanisms: financing and knowledge production. International financing for DRR, climate change adaptation and poverty reduction influences local governments' decisions and actions around these issues. Similarly, the international community supports knowledge-sharing platforms for city-to-city learning.

The media is also a relevant player due to its dual role of information provider and opinion setter. The electronic and print media extensively covers disasters and affects what the public learns and how it perceives hazards and risk. Social media (blogs, messaging, sites such as Facebook and so on) is useful to learn about ongoing public debates, monitor situations and impart emergency response information. Sometimes, however, the media also helps spread rumours, adding to confusion and undermining official information. Improving the linkages between the media and DRR managers could prepare the public to act promptly on warnings and respond adequately during emergency and post-disaster situations. Even more, it could contribute to forge a better understanding of the connections between development and DRR. Increasingly, the media

is being included and trained to fulfil these tasks responsibly, establishing and maintaining direct and effective working relationships with those who have the role of coordinating DRR.

It is important to recognize that there are often political contradictions and conflicting power relations between actors. Different, sometimes clashing, interests might underpin and orient their decisions and actions. It is by recognizing and respecting these different positions and by finding common ground that cooperative solutions can emerge. Political will from all sides to join discussions and work together is crucial.

EXPLORE MORE

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

UNISDR Platforms for DRR
http://www.unisdr.org/we/coordinate

FURTHER READING (SEE REFERENCES SECTION)

Johnson et al. 2013; Pelling 2011b; UNISDR 2013

4.1.4. PARTICIPATORY MECHANISMS IN PLACE

Local actors need to engage meaningfully to make a difference. Participatory mechanisms should be in place to help local governments and other local actors work together. Some countries have legal frameworks that mandate participation in DRR – for instance, participation of community members and local organizations in local DRM committees – or that ensure spaces where participation succeeds. In most cases, though, participation is initiated in response to specific problems and events; community members gather together to pursue a common goal, but shortly disperse when that goal is achieved. The inaction and low performance of local governments on routine development or post-disaster activities often drive communities to take over certain issues. When provision of adequate housing, infrastructure and services is lacking, the capacity of individuals and communities to address DRR becomes central, especially their capacity to work and negotiate with different local/urban actors.

To a large extent, engaged local actors working with local governments can minimize risk, set the right priorities and help shape recovery in ways that strengthen local livelihoods and well-being. There are good examples which all highlight the need for local governments that are accountable and willing to work with a wide range of stakeholders throughout collective decision-making processes, either within the DRR sector or as part of wider local development processes, such as participatory budgeting. This strengthens disaster risk governance, as established by the Sendai Framework Priority for Action 2.

SEE SECTION 6 - **CASE STUDY 2 AND 3**

In Kullu district, Himachal Pradesh (India), engagement of the local community helped develop mechanisms not only to secure better responses to fire hazards but also to improve road accessibility and water availability for everyday needs. In Kuroshio Town, Shikoku region (Japan), cooperation between communities and the local government resulted in the development of tsunami countermeasures suited to local needs and possibilities. Besides improving disaster response, the process strengthened the local social fabric.

USEFUL TOOLS

CLIMATE CENTRE GAMES
The Climate Centre and its partners have designed games that cover a range of topics, including disaster preparedness, disaster risk reduction, resilience, collaboration, etc. Games simplify complex problems and speed up learning, dialogue and action.
https://www.climatecentre.org/resources-and-games/games

CORDAID GAMES
Cordaid has designed a Collaboration Game and a Planning Game to aid multi-actor processes.
https://www.cordaid.org/en/wp-content/uploads/sites/11/2014/04/Cordaid-2Pager_Serious_Gaming_October_2014.pdf

EXPLORE MORE

cLIMAsinRiesgo - Mapping everyday and episodic risks
www.climasinriesgo.net

ReMapRisk – Lima
http://www.climasinriesgo.net/remaprisk-lima/?lang=en

Online Story Maps
http://www.climasinriesgo.net/remaprisk-lima-mapping-action/

Slum Dwellers International - Know your city
http://knowyourcity.info

BOX 5

Participatory budgeting

Over 1,700 local governments in more than 40 countries are implementing participatory budgeting, where citizens meet to discuss priorities for part of the local government's budget for their neighbourhood or the city as a whole and oversee project implementation. Participatory budgeting is contributing to reduce everyday stresses, such as basic service provision and management, and supports governance.

Source: Cabannes (2014)

4.2. SHARED BASELINE UNDERSTANDING OF LOCAL DISASTER RISK AND RESILIENCE

A shared understanding of the relevance of DRR for the future development of the city is necessary. This is about having everyone on the same page and starting to build a coherent DRR process integrated in the local development process. No city starts from scratch; indeed, there is always a wealth of knowledge sources (scientific, technical and lay, including indigenous) that cities need to tap. This will contribute to a better understanding of the types of risks, their possible combinations and concatenated impacts, and the types of resources at hand, as well as gaps and barriers in understanding risks and implementing actions.

Experience shows how knowledge co-production is central to disaster risk reduction and climate change adaptation, especially when various types of knowledge are recognized and included from the beginning of the process.

However, generating consensus among local actors is not an easy and one-off step. Instead, it is a process of on-going negotiation, conflict resolution, coordination and consensus-building among different actors with different visions and ideas about the type of city they want.

There are certain moments when reaching consensus might be easier – e.g. after a disastrous event when there is a general perception of the need to do something. In other cases, there might be an organization or social movement that pushes for DRR as a priority in the local political agenda. International agreements can also encourage engagement and lead cities to commit to DRR irrespective of their national contexts. Above all, strong leadership – in the form of committed mayors and/or technical teams with political support – has proven to be essential to initiate the process.

There are several participatory tools available (see **Useful tools** below) that can ease the initial phase of sharing information and build a baseline understanding on risks and resilience and how they connect to overall development.

The preliminary diagnosis should cover a broad assessment of the environmental, socio-economic, spatial and political context, together with the identification of the most likely hazards, exposure patterns and vulnerabilities. It is worth noting that local risk profiles do not necessarily mean sophisticated risk assessments. Data generation and information should not be a limitation for DRR planning and action. Many cities embark on using the latest, most sophisticated information management technology or get involved in complex data gathering and consolidation processes that are time-consuming, require the development of special capacities (human and technical) and are very difficult to update. Disaster risk profiles can be built using less sophisticated information management systems. For example, what is often missing is a good vulnerability analysis to have a clear understanding of which factors are leading some groups, sectors or ecosystems to be affected by different hazards or combination of hazards.

Existing capacities should be identified from the beginning. This includes mapping local actors and their skills as well as existing plans, programmes and projects that contribute to DRR. It also entails the identification of useful information, together with a clear understanding of who produces, gathers and/or consolidates meaningful data. The key message is to not start from scratch but rather boost existing capacities and resources.

SEE SECTION 6
CASE STUDY 4
Participatory mechanisms in Marunda, northern Jakarta (Indonesia), propelled a better and more detailed understanding of local risks and helped design appropriate responses with multiple co-benefits.

SEE SECTION 6
CASE STUDY 3
Leaders from Greater Manchester (UK) highlight three key requirements for developing a DRR and resilience strategy.

Both history and the future matters. Historical trends in relation to land occupation, urbanization, economic development, service provision, etc. and how these have affected hazard, exposure and vulnerability patterns are certainly relevant. Equally important, mainly in relation to future risks and uncertainty, is the consideration of different scenarios, including future climate scenarios.

SEE SECTION 6
CASE STUDIES 6
The city of Kampala (Uganda) illustrates the main challenges in developing strategies to strengthen resilience in the context of climate change and rapid urbanization in a low-income country.

EXPLORE MORE

COBRA – Participatory and intercultural fire management
http://projectcobra.org/cobra-project/stimulate-discussion/

USEFUL TOOLS

QUICKSCAN

This is a participatory modelling method that links stakeholder and decision-maker knowledge and preferences to available spatial and spatio-statistical data and is designed for group use. QUICKScan has been used in a range of settings to assess societal and environmental conditions, diagnose patterns and interactions, explore alternative responses and evaluate the impacts of those responses. It is useful for vulnerability and adaptation assessments.
http://www.quickscan.pro

QUICK RISK ESTIMATION (QRE)

A tool for identifying and understanding current and future risks, stresses, shocks and threats to both human and physical assets. It proposes a multi-stakeholder engagement process to advance a common understanding of risk and it produces a dashboard-style risk assessment.
http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=3

OPEN DATA INFRASTRUCTURE FOR CITY RESILIENCE

The tool consists of three parts:
(1) a roadmap to assist city authorities in the creation of an information and data framework for the Ten Essentials;
(2) a showcase of real-world cases illustrating the innovative use of open or mixed uses of data;
(3) a guide for developing local open data infrastructure
https://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=21

DISASTER RESILIENCE SCORECARD FOR CITIES

The scorecard provides a set of assessments that allow local governments to evaluate their disaster resilience against UNISDR's Ten Essentials. It helps monitoring and reviewing of progress in the implementation of the Sendai Framework at the local level. Preliminary and advanced versions are a
vailable, depending on the time and information of those conducting the assessment.
http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4

FURTHER READING (SEE REFERENCES SECTION)

Baud et al. 2014; Baud et al. 2016; Mondlane et al. 2013

05

DEVELOPING AND ADJUSTING LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES

The development and adjustment of local disaster risk reduction and resilience strategies entails:

- Organizing for disaster risk reduction and resilience (Essential 1) and evaluating how to proceed given the local context, disaster risk profile and operating governance structure;
- Knowing and understanding current and future risks (Essential 2), to plan accordingly and to develop anticipatory, corrective and compensatory risk management measures;
- Having financial resources to be able to plan and act (Essential 3).

The first three essentials from the Making Cities Resilient campaign are the pillars for working on the other seven essentials. Whereas this guide focuses on these fundamentals, there are other WIA guides expanding on each of the remaining essentials and on the implementation of the strategies through sectoral and emergency for response plans.

5.1. ORGANIZING FOR DISASTER RISK REDUCTION AND RESILIENCE

5.1.1. ORGANIZATIONAL STRUCTURE

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **How do we organize for DRR and resilience?**

Each locality needs to evaluate what type of organizational design works best for them. The integration of DRR into development management suggests that it should not need to create new organizational forms to address disaster risk. Instead, DRR should be incorporated into existing structures (ministries, secretaries, offices and directorates) that are in charge of managing different dimensions of development (environmental, sectoral and spatial). However, it seems to be important to have an entity to command and coordinate these existing structures around the disaster risk *problematique*.

Typically, cities have started with an organizational structure designed to prepare, respond and recover from emergencies. Based on the traditional civil defence paradigm, this organizational structure is transitioning in some cities towards new systems that integrate DRR goals within relevant government planning practices. This evolution recognizes the importance of reducing disaster risk and the need to weave DRR into local policies, plans and practices. However, as in the case of any other transition, this process is usually challenged by existing organizational and governance structures, social, economic and political factors, and, ultimately, current development pathways.

Organizational reforms can follow different trajectories – from specific/sectoral to transversal/cross-cutting approaches to DRR. Indeed, pathways vary from place to place and might even mix and shift across time.

5.1.1.1. Specific DRM office/department within the local government

The initial step is creating a new office or designating an existing one to take up a coordinating role. The overall idea is not to duplicate responsibilities but rather have a specialized office to: (i) develop a common vision around DRM; (ii) guide policies and actions; (iii) prepare and respond to emergencies; and (iv) disseminate the adoption of a DRM framework across different areas and levels of government in order to address the underlying risk factors. Thus, the specialized office/department has a coordinating responsibility and tries to build consensus across the different sectors and actors involved. It is important to bear in mind the ministry or department that the coordinating agency reports to. The higher this is in the organizational structure, the more political support it is likely to get.

In a range of cities, it has proved to be useful to have a unit responsible for DRR within the city government to draw together and integrate relevant data, raise awareness and inform politicians and civil servants, encourage engagement by different sectors and departments and consult with key stakeholders. This office often plays a key role in developing professional skills within the government and in sanctioning special legislation and policies. Likewise, there is an ever-present need for a specialized, well-trained sector dedicated to managing disasters, with adequate resources and professional skills.

5.1.1.2. DRM as a cross-cutting issue within local government

Other cities go a step further and embrace an approach that considers DRR and development as locked together and reinforcing each other. They often adopt the notion of resilience as a more encompassing concept to include issues such as armed conflict, violence, social and economic inequality, etc., and push further to address underlying disaster risk drivers.

Even the most advanced countries and cities which have DRM as a crosscutting issue in their development agendas are still lagging in implementation. This is certainly true if measured by the progress they have made in tackling root problems – access to land, housing, services and infrastructure, inequality and lack of transparency and accountability. As German Arce (2015) summarizes, “it is more what we have learned than what we have done.” In other words, significant progress has been made in understanding the construction of risk, but we are still lagging behind in implementation and capacity to address the problem.

SEE SECTION 6
CASE STUDY 5, 7 AND 8
Greater Manchester (UK), Makati City (Philippines) and Santa Fe (Argentina) have organized for DRR and resilience and sustained a DRM process over several years.

5.1.2. OTHER ELEMENTS TO CONSIDER

Together with the organizational design, there are other institutional elements to consider when implementing a local DRR and resilience strategy:

- Written laws, regulations and codes
- Mainstreaming DRR across sectors and actors
- Building capacities
- Horizontal and vertical coordination

5.1.2.1. Rules on paper

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **Who's who?**
- **Who does what in the DRR process?**

Legislation and formal, written rules are important because they define mandates – that is, responsibilities for which people occupying specific roles are accountable. For many practitioners and government officials, written rules contribute to the sustainability of the local DRR process, overcoming government changes and (in some cases) securing a budget independent of political cycles.

In many cases, national legislation for DRR helps shape national DRR and resilience strategies, with corresponding structures at subnational levels. This allows for the decentralization of roles and responsibilities to lower government levels and provides an overall coordination structure that can articulate between sectors and government levels. National government structures support the development of local governments' capacity for DRR and assign financial resources for the task. Since national laws and regulations related to DRR are relatively new, they usually incorporate participatory decision-making mechanisms that are in agreement with current good governance practice

BOX 6

National legislation for local DRR and resilience

PHILIPPINES

In 2010, the Government of the Philippines enacted the Disaster Risk Reduction and Management Act (RA 10121) and adopted a Strategic National Action Plan for Disaster Risk Reduction. Reforming the policy and action framework for disaster risk management was a national priority. The DRR and Management Act provides a comprehensive, all-hazard, multi-sectoral, inter-agency and community-based approach to disaster risk management through the formulation of the National Disaster Risk Management Framework. It mandates the preparation of a National Disaster Risk Management Plan (NDRMP) that aims to strengthen the capacity of the national government and local government units (LGUs), together with partner stakeholders, to build the disaster resilience of communities, institutionalize arrangements and measures for reducing disaster risks – including projected climate risks – and enhance disaster preparedness and response capabilities at all levels. It creates a National Disaster Risk Reduction and Management Council.

At subnational levels, the Disaster Risk Reduction and Management Act mandates: 1) the establishment of a disaster risk reduction and management office (DRRMO) in every province, city and municipality; 2) the creation of a Barangay Disaster Risk Reduction and Management Committee (BDRRMC) in every barangay (the smallest administrative division); and 3) the development of local disaster risk reduction and management plans (LDRRMPs). It also transforms the Local Calamity Fund into the Local Disaster Risk Reduction and Management Fund (LDRRMF) and allocates no less than 5% of the estimated revenue from regular sources to support disaster risk management activities.

USEFUL LINKS

http://www.ndrrmc.gov.ph/attachments/article/45/Republic_Act_10121.pdf
http://www.ndrrmc.gov.ph/attachments/095_IRR.pdf

COLOMBIA

In April 2012, the Government of Colombia enacted law no. 1523, which delineates a national DRM policy and creates a national DRM system (*Sistema Nacional de Gestión del Riesgo de Desastres – SNGRD*). The new law states that DRM is everyone's responsibility and defines DRM as a social process that elaborates, implements, monitors and evaluates policies, strategies, plans, programmes, tools and actions for DRR and DRM.

The national DRM system brings together public, private and community entities under a new organizational structure that comprises the DRM National Council, DRM National Unit (*Unidad Nacional para la Gestión del Riesgo de Desastres - UNGRD)*, three national advisory committees (risk knowledge, risk reduction and disaster management) and subnational councils (at department, district and municipal levels). Subnational councils are under governors' or mayors' supervision, together with their corresponding subnational DRM units and subnational advisory committees.

The UNGRD is in charge of elaborating the national DRM plan, which is approved by the National DRM Council, including the President of Colombia. Subnational DRM units are in charge of coordinating the elaboration of local DRM plans. The system proposes strong vertical and horizontal coordination and cooperation. In addition, the law establishes that all public investments need to be evaluated through a disaster risk lens. Local territorial plans, river basin management plans and development plans have DRR as a cross-cutting theme.

The law also creates a National DRM Fund that is autonomous and independent from national funds and expenses. Sub-accounts are defined based on DRM activities (knowledge generation, risk reduction and disaster management) and funds are executed according to the National DRM Plan.

USEFUL LINKS

http://portal.gestiondelriesgo.gov.co/Paginas/Estructura.aspx
http://portal.gestiondelriesgo.gov.co/Documents/Normatividad/LEY%201523%20DEL%2024%20DE%20ABRIL%20DE%202012.pdf

In the absence of a national DRR strategy or legal framework, some cities have been pioneers within their countries, sanctioning an ordinance or municipal bylaw to create a DRR system for their jurisdiction. Similarly, these cities usually pass norms to reform building codes, land-use zoning and environmental regulations that can contribute to DRR and resilience. Some of these local processes have indeed inspired and informed regional and national strategies and plans.

Legislation and norms should go hand-in-hand with budgetary support, better accountability in the use of funds and increased local professional capacities. Coherence between national and subnational legislation frameworks is also important. Without all these, there is little chance for laws and regulations to have a significant impact in effectively reducing risk.

5.1.2.2. Rules in action: mainstreaming DRR across sectors and actors

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **How do we incorporate DRR into the everyday practices of local actors?**

Mainstreaming DRR across sectors and actors involves incorporating the practice of risk management within all the operations of local governments and in the everyday practices of other urban actors. Having a strategy – a common vision and shared understanding of DRR – across sectors and actors is crucial. It is also important that plans and actions implemented by different sectors and actors are coherent and consistent and based on up-to-date risk information.

Pursuing resilient urban development and design, enhancing ecosystem services and developing risk-reducing and resilient infrastructure are (or should be) part of the everyday practices of local governments. In contexts where resources are scarce, the focus should be on actions that fulfill multiple purposes – those that make sense for pursuing local development while simultaneously addressing everyday risks and less frequent extreme events.

There is no silver bullet for resilient development. Resilience will be achieved through a mix of measures taken over time that are mutually reinforcing and complementary. In the process of developing local resilience, lessons can be internalized and experience gained to inform future behaviour. There is a set of qualities resilient systems have that is important to keep in mind: redundancy (spare capacity purposely created to accommodate disruption and multiple ways to fulfill a particular need); robustness (accommodate certain failures and ensure that failure is predictable, safe); flexibility (willingness and ability to change, evolve and adapt in response to changing circumstances); reflectiveness (learning from the past and adjusting); resourcefulness (rapidly find alternative ways to achieve goals or meet needs); inclusivity (emphasize the need for broad consultation and participation) and, integration (as the process brings together systems, institutions and actors, it can catalyse additional benefits as resources are shared and actors work together).

USEFUL TOOLS

Enhancing Resilient cities and City Resilience Framework
http://www.100resilientcities.org/resilience#/-_/

City Resilience Index
http://www.arup.com/city_resilience_index

Urban Resilience Master Planning
http://emi-megacities.org/?emi-publication=urban-resilience-master-planning-a-guidebook-for-practitioners-and-policymakers

Resilience tools
http://resiliencetools.org/tools-overview

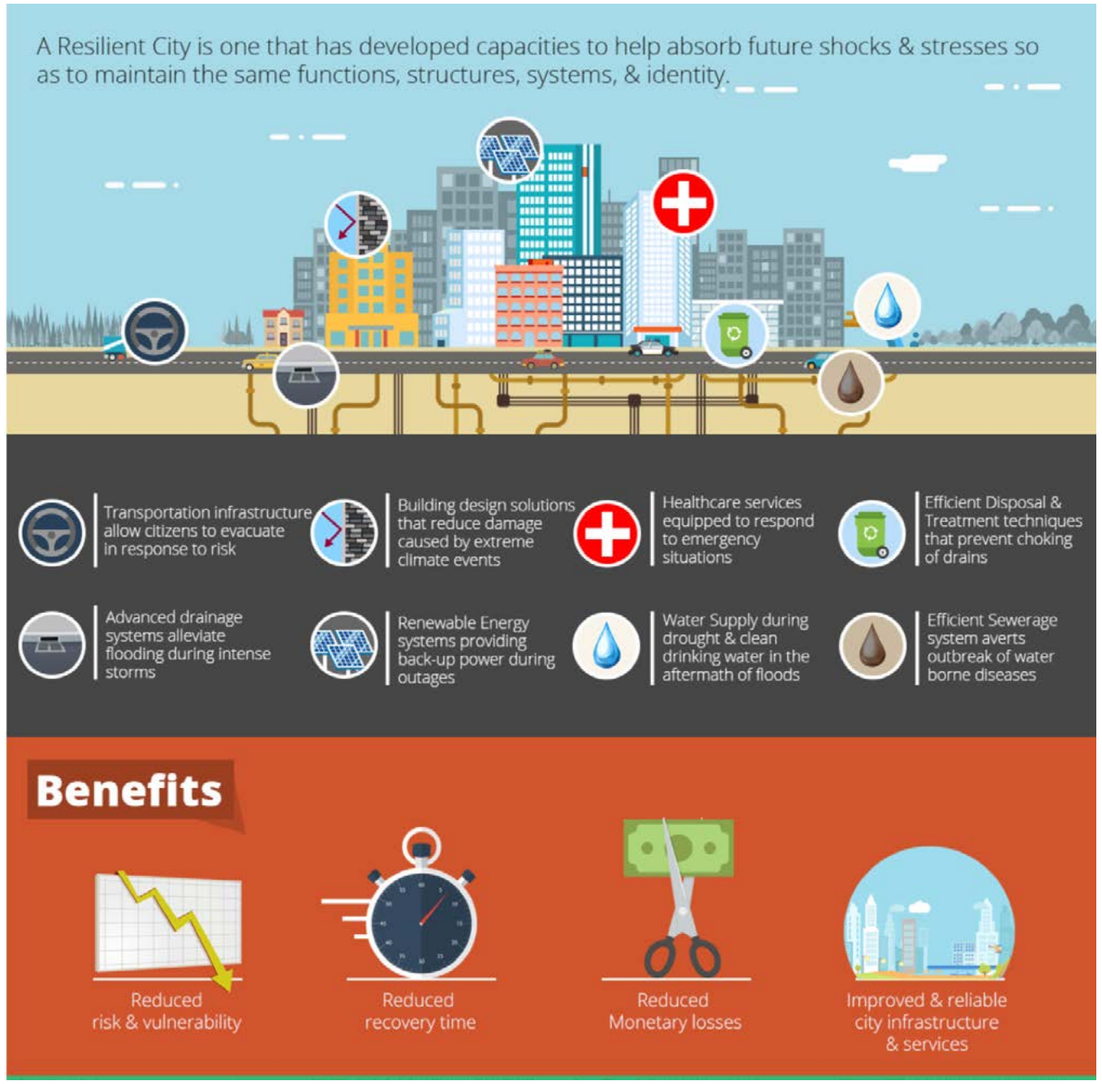
Co-benefits of urban climate action: A framework for cities
http://www.c40.org/researches/c40-lse-cobenefits

FURTHER READING (SEE REFERENCES SECTION)

Da Silva, Kernaghan & Luque, 2012; MacClune & Optiz-Stapletlon, 2012; World Bank, 2011

FIGURE 5

A resilient city



Source: Adapted from ACCCRN (2016)

5.1.2.3. Building capacities

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **How do we create a shared vision and understanding of DRR to gain support from most - if not all - local actors as part of the process?**

Building institutional and societal capacities is crucial for the acceptance of, compliance with and enforcement of written rules. This is essential for those who enforce rules and for those who must comply with them. The ability to manage complex problems and engage in multi-stakeholder and multi-sectoral processes lies at the core of these capacities. Different mechanisms are useful for building institutional and societal capacity:

- Training
- Self-assessment reports
- Participatory appraisals
- Networking and sharing

Local governments can partner with other local actors that already have some knowledge of DRR (e.g. universities, professional associations, NGOs, local communities and/or the private sector). These actors can help plan and implement DRR practices which are tailored to the specific needs and possibilities of each city. They can also support the development of required professional skills. Capacity-building efforts should be directed to a wide range of actors in order to raise awareness and commitment to DRR and resilience building.

SEE SECTION 6 - **CASE STUDY 5**
Greater Manchester (UK) has applied various frameworks and tools for localizing DRR and resilience

Networking between different actors and across cities helps strengthen local capacities and nurtures a learning process. Networking and sharing are equally relevant for cities with well-established knowledge and practice of DRR and resilience.

SEE SECTION 6
CASE STUDY 7
The Makati Disaster Risk Reduction Management Office, in partnership with the Philippine Institute of Volcanology and Seismology, conducts training on rapid earthquake damage assessment systems for city staff and volunteer surveyors.

Self-assessments and participatory appraisals are valuable for reflecting on whether actions are on track and fulfilling expectations. Capacity for self-reflection, critical analysis and sharing with others should be an integral component of local DRR strategies. There are useful and readily available tools and methodologies to aid in these processes.

5.1.2.4. Horizontal and vertical coordination

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **How do we coordinate different areas/sectors within and outside government for coherent and integrated DRR practices?**
- **How do we link the local institutional and organizational dimension of DRR with higher levels (provincial, regional, national)?**

Mainstreaming DRR into all sectors requires a good understanding of the multiple and complex connections between development issues and coordinated responses. Furthermore, DRR measures often need to go beyond existing political and administrative boundaries and the territorial definition of each locality, requiring vertical and horizontal integration, coordination and collaboration, between different sectors and government levels, across jurisdictions, and engaging multiple actors.

In addition, many underlying risk drivers result from processes unfolding at other scales (regional, national or global). Hence, they are beyond local intervention possibilities and depend on decisions made by actors operating at other levels. How well a local government negotiates with other government spheres defines how much political and financial support it gets. This, in turn, influences planning processes and projects' implementation.

5.2. KNOWING AND UNDERSTANDING CURRENT AND FUTURE RISKS

Any attempt to manage local disaster risk needs to identify current and future risks, including an understanding of the underlying risk drivers. Risk appraisal and risk communication play a prominent role in DRM. They both deal with information (raw data and facts). But what truly matters is knowledge – how individuals codify/decode information and make sense of the data and facts to plan and act.

5.2.1. RISK APPRAISAL

It is possible to think about risk appraisal according to the three DRM areas of practice – to develop prospective, corrective and compensatory risk management measures:

- For prospective risk management ➡ risk modeling and scenario building to consider climate change and/or any other future threats.
- For corrective risk management ➡ comprehensive hazard, vulnerability and exposure assessments based on past events and historical trends.
- For compensatory risk management ➡ calculations of loss and damage, sectoral impacts, etc., resulting from realized risks.

Conventional technical risk appraisals are more and more frequently enhanced with participatory approaches. In this way, risk appraisal engages with information that is usually left out or is invisible to desk planners, technicians and decision makers. This might include, for instance, enumerations in informal settlements which gather detailed data on housing and households and the conditions of the immediate surroundings. Another example is participatory neighbourhood/ward/block diagnoses that highlight local problems a community faces on a daily basis. Not surprisingly, many decisions are made blindly, with no real understanding of local realities and the needs and capacities of local residents. Similarly, risk appraisal has to incorporate the experience from practitioners and city managers gained during the implementation of plans and policies. This can bring a realistic understanding of the local and regional context, including political knowledge.

Each locality should define what type of information is relevant to build knowledge and guide action, and how it is regularly updated. It can be more or less sophisticated and should be understood as a work in progress.

SEE SECTION 6
CASE STUDY 7

The Gender and Development Checklist for Designing Disaster Risk Reduction and Management Projects contributes to mainstream a gender perspective in local DRM projects in Makati City (Philippines).

Geospatial information – and the use of geographical information systems (GIS) – is gaining prominence among city planners and managers. It usually includes hazard mapping (showing area of influence, intensity and frequency by different types of hazards) and analysis of exposed assets (such as buildings and critical infrastructure) and vulnerability (according to groups, sectors and infrastructure). This can be also combined with 3D simulations and modeling, depending on available data at the local scale and software at hand to process it.

[See the "Words into Action" guideline for local authorities for more details on knowing and understanding current and future risks.]

USEFUL TOOLS

IFRC Vulnerability and Capacity Assessment
http://www.ifrc.org/vca

Toolbox
http://www.ifrc.org/Global/Publications/disasters/vca/vca-toolbox-en.pdf

Training guide
http://www.ifrc.org/Global/Publications/disasters/vca/vca-training-guide-en.pdf

CARE Climate vulnerability and capacity assessment handbook
http://careclimatechange.org/tool-kits/cvca/

InaSAFE - Free software that produces realistic natural hazard impact scenarios for better planning, preparedness and response activities
http://inasafe.org

CIUrb Accessible and affordable software solutions for urban challenges
http://clurb.net/en/

FURTHER READING (SEE REFERENCES SECTION)

Moser & Stein 2011; Renn 2006

SEE SECTION 6
CASE STUDY 8

The city of Santa Fe (Argentina) has set up a monitoring system to consolidate and report downscaled data at city level. The municipal DRM office monitors meteorological and hydrological conditions and ensures timely communication with residents.

BOX 7:

Guiding questions to help you understand exposure and vulnerability in your local area:

- Who lives and works in places exposed to hazards?
- Who lives and works in places that do not have risk-reducing infrastructure and services?
- Who lacks knowledge, capacity and opportunities to take short-term measures to limit disaster impact?
- Who and whose homes face greatest risk when impacts occur?
- Who is least able to cope with impacts and/or adapt to or avoid them?

Source: based on Hardoy & Pandiella (2009)

5.2.2. RISK COMMUNICATION

Communication is a cross-cutting element in the DRM process. It should not be one-way, where experts transmit their findings and recommendations, but rather a dialogue that brings together all concerned parties from the very beginning of the baseline diagnosis process (see section 4.2).

To be useful, co-produced information and knowledge should be communicated effectively and reach all potential users. In addition, users need to know what to do with that information and knowledge. Users of information are likely to be more receptive to communications when they themselves have been part of the co-production process. This also helps to build and reinforce capacities.

From a prospective risk management perspective, risk communication is usually linked to education and the inclusion of DRR and resilience in school curricula and/or university programmes. In a corrective risk management approach, risk communication entails the co-production of evacuation plans (e.g. at neighbourhood level), dissemination of communication materials with evacuation routes, meeting points and recommended measures in case of a disaster, and the deployment of routine evacuation simulation exercises.

Developing communication skills and tools is fundamental, as is building trust on the information being communicated. Caution is needed, as sometimes there is good communication, but effective response does not follow. Different variables mediate individual decision-making, including personal behavior and values and the existence of livelihood opportunities, social ties and reciprocity from neighbours and the community. The relevance of place, emotional attachment and choice should not be underestimated.

The media (newspapers, radio, TV and, increasingly, social media) plays a key role in the amplification/attenuation of risk perception. Media professionals and lobby groups mediate knowledge production and action; hence, it is crucial to engage them in the DRR process and build their capacities.

USEFUL TOOLS

CAPRA (probabilistic risk assessment) – an initiative that aims to strengthen institutional capacity for assessing, understanding and communicating disaster risk.
http://www.ecapra.org

SEE SECTION 6
CASE STUDY 8
A risk communication programme has been at the centre of the DRM process in Santa Fe (Argentina).

5.3. HAVING FINANCIAL RESOURCES TO BE ABLE TO PLAN AND ACT

AS A LOCAL LEADER, PLANNER OR MANAGER ASK YOURSELF:

- **Who does what and with what funding?**

It is well known that decentralization is often not matched by a transfer of sufficient financial resources or local powers to raise revenues – although it should be noted that the degree of decentralization and devolution of powers varies greatly from country to country, depending on the political-administrative system of each nation. In low and most middle-income countries, local governments are overwhelmed with demands and have limited budgets, which in turn are often earmarked for specific tasks. In many cases, they also lack the technical capacities for improving their tax and revenue collection systems and their financial credentials to access multilateral funding.

There are at least three things to focus upon when thinking about financing DRM at the local level:

1. Make the case for financing DRM locally.
2. Agree upon what should be financed.
3. Identify existing and potential sources of funding.

In relation to the first point, a good way forward is to calculate and communicate the costs and benefits of disaster risk management – the cost of disastrous events for local governments, businesses and homeowners vis-à-vis investing on prevention. This is a powerful tool to vindicate the idea that prevention costs less than response and recovery.

Regarding the second element, it is useful to bear in mind the entire DRM cycle and consider its three dimensions: proactive, corrective and compensatory risk management. Whereas different emphasis might be placed on each of these dimensions, it is important to consider them in an integrated and holistic manner. In practice, however, they are usually financed by different sources, which limits their integration. The latter refers to the third point, which is the various alternatives for financing DRM at the local scale.

SEE SECTION 6 - **CASE STUDY 9**
With national government support, the city of Manizales (Colombia) has developed mechanisms to secure financial resources for local DRR initiatives..

Prospective and corrective risk management are often tied to local financial resources (e.g. municipal annual budget derived from municipal taxation, municipal revenues, transfer of funding from national/state government according to federal laws, etc.).

When there is a truly cross-cutting approach to DRR within the local government, the allocation of financial resources for DRR is distributed among different sectors and departments. This sectoral approach is certainly the most relevant as it is targeted to dealing with the root causes of disaster risk (avoiding/reducing hazard, reducing vulnerability, preparing for response and preparing for recovery).

It is interesting to note, though, that it is quite difficult to specifically allocate and account for money for DRR at sectoral/departmental level. Indeed, a stand-alone DRR budget by sectors is not easily allocated – and it might not be wise to do so either. The blurred line between reducing disaster risk and advancing sustainable development makes it hard to calculate the real budget that is spent on DRM. When DRR is embedded and mainstreamed into an organization – such as the local government – it forms part of the daily activities of each department.

As DRR focuses mainly on ex-ante disaster investments, which are heavily interwoven with sectoral development, the critical point is to put in place certain mechanisms for each department to appraise and evaluate core responsibilities and daily work with a disaster risk lens. This kind of DRR-embedded regular sectoral budget is what will get sectoral DRR activities realized. Regarding potential mechanisms for promoting risk-sensitive sectoral development, formal and informal ones can be activated. And here the role of a DRM focal point is crucial.

The DRM focal point (e.g. DRM office) might not (and should not) get all the budget for DRR. But it should act as a constant reminder to the other sectors/departments that they need to consider DRR in their everyday work. The DRM focal point can, for example, set up inter-departmental commissions for treating specific DRR-related issues (e.g. relocation of households in flood-prone areas, involving the departments of urban planning, social development and water resources). Or it can play its reminder role in a subtler informal manner during cabinet meetings when specific projects are discussed among top-level representatives from each department.

Some hints:

- Incorporating DRR in the daily job of different areas goes a step beyond the design and implementation of individual projects and programmes. It is about making DRR part of the ‘normal’ and ‘everyday’ work of each area.
- Each department has its own functions and responsibilities and has a different role to play in DRR/DRM. It is necessary to understand how each department/sector can and should contribute to the reduction of each specific disaster risk. Some departments/sectors might have more tangible (‘structural’) functions in reducing disaster risk (e.g. an infrastructure department) whereas others might have a more unnoticed role (e.g. department of education).
- The role of each department/sector might also greatly vary depending on the type of disaster risk under consideration, its frequency and severity.
- As stated before, it might be hard to strictly quantify how much money is spent by each department/sector on DRR, and it might be unadvisable that each department/sector allocates budget specifically for DRR. But a way forward might be to start with the allocation of a specific budget for preparedness for response and preparedness for recovery at sectoral level – that is, what each department should do to be ready to respond to a disastrous event and to recover in its aftermath, and how much money it would need. And from there, to start thinking about more integral ways of mainstreaming and embedding DRR in the everyday work of each department.
- Each sector can embed a disaster risk lens into existing project appraisal mechanisms to account for the cost and benefits of DRR measures and to ensure that sectoral development considers disaster risk.

In addition to mainstreaming DRR into sectoral/departmental budgets, local governments can also provide incentives for homeowners and businesses to invest in avoiding and reducing the risks they (might) face. This can augment the pool of financial resources, secure long-term sustainability and help in building co-responsibility.

A few examples here from the city of Santa Fe (Argentina):

⁎System of contributions for improvements. A group of homeowners from the same block ('frentistas') can arrange with the municipal government for sharing the cost of certain improvements in the area (e.g. pavement, open drainage, etc.).

⁎Municipal ordinance project on incentives to developers for investing in public devices to retard water runoff. By law, every new development needs to pass an assessment test of built area impermeability and install the mandated devices for retarding water runoff. This ordinance project proposes that instead of installing devices in new private buildings, developers could assign the equivalent amount of money to a joint fund that would be used to install devices for water runoff retardation in public spaces (e.g. streets, parks, boulevards, etc.). This reduces the burden on developers for adding a new device in their projects, while at the same time increases the efficiency of devices for retarding water runoff (it seems to be more efficient to have them installed in public spaces rather than in individual new private constructions/developments).

Availability of financial resources at the local level certainly provides autonomy and more room for manoeuvre for context-specific approaches and experimentation. But there is also international funding that could boost the potential for action of local actors. The most relevant funding alternatives might not be those targeted at large-scale infrastructure or development projects, but rather those aimed at training and raising awareness among key local actors. International city networks (such as C40, 100RC, ICLEI, UCLG, and Mercociudades) are playing a key role in this. The joint efforts of multiple cities across these networks can also aid the channeling of and access to multilateral funding (otherwise not available to or difficult to access by individual cities).

Multilateral financing for DRR and climate change adaptation (CCA) is still largely channeled to national states, although calls for funding proposals are opening up to local governments progressively. Local governments need to start aligning with international fiduciary principles and standards as well as acquiring project management skills to apply for and manage internationally funded projects. They should also keep coherence between different funding alternatives and avoid fragmented planning. Some cities have an international cooperation office (or similar) that usually provides guidelines and orients this process. Those cities that do not have this option should think about who can coordinate international financing for DRR and CCA.

Compensatory risk management receives mostly local and national funds, which are defined in advance for specific emergency activities (usually following internal protocols and according to different alert levels). Depending on the circumstances, emergency decrees or laws are passed to reinforce response and recovery and allocate extraordinary funding. Similarly, international funds and contingent credit lines can add to this.

The ready availability of financing for emergencies sometimes discourages proactive strategies. Often, sectoral budgets associated to emergency response and relief operations are for 'building back to original', which does not contribute to the risk reduction effort. Instead, financial resources allocated for compensatory risk management should be used for 'building back better'. The latter requires (self-) evaluation procedures after emergencies to assess what did not work and should be improved.

BOX 8:

FONDEN (Fondo de Desastres Naturales, Mexico)

Mexico's Fund for Natural Disasters was established in the late 1990s as a mechanism to support the rapid rehabilitation of federal and state infrastructure affected by adverse natural events. Today, FONDEN consists of two complementary budget accounts, namely: the original FONDEN Programme for Reconstruction and the Fund for Disaster Prevention (FOPREDEN), designed to promote stronger ex-ante DRM. Despite the Mexican government's recognition of the need to fund ex-ante DRM, resources for prevention remain significantly less than those for reconstruction.

FONDEN is funded through the Federal Expenditure Budget, with a legally-fixed amount of no less than 0.4% of the annual federal budget (or about US$800 million), distributed between FONDEN, FOPREDEN and the Agricultural Fund for Natural Disasters. The FOPREDEN Programme for Prevention supports disaster prevention by funding activities related to risk assessment, risk reduction and capacity building for disaster prevention. FONDEN finances 100% of the reconstruction costs for federal assets and 50% of those for local assets. If disaster strikes again, the percentage declines if insurance has not been purchased for reconstructed assets.

Source: Kul et al. (2013:32)

Compensatory risk management is also associated with various types of insurance, reinsurance and other risk-transfer instruments, such as catastrophe bonds (cat bonds) – although the last ones tend to be clustered in cities of high-income countries. The Colombian city of Manizales has been running a voluntary collective insurance system. Through cross-subsidy, higher income sectors cover the insurance costs for low-income groups or organizations working for the public good. Insurance costs are charged with local property taxes and set at a percentage of property value.

Home and business insurance can wrongly give an incentive for settling in risk-prone areas or developing certain activities by offering a perception of safety. But insurance provision is in any case usually not available for low-income households and hence other mechanisms should be arranged – for example, Red Cross Santa Fe (Argentina) distributed provisional cards for cash transfers to affected households after severe flooding.

USEFUL TOOLS

Climate insurance
http://www.climate-insurance.org/about/

C40 Cities Finance Facility
http://www.c40.org/programmes/c40-cities-finance-facility

Global Facility for Disaster Reduction and Recovery
https://www.gfdrr.org/en

IDB financial risk management mechanisms and instruments
http://www.iadb.org/en/topics/natural-disasters/idb-helps-latin-america-to-develop-natural-disaster-insurance,2719.html

World Bank Disaster Risk Financing and Insurance Program
http://www.worldbank.org/en/programs/disaster-risk-financing-andinsurance-program

5.4. MONITORING AND LEARNING

The implementation of a disaster risk reduction and resilience strategy is a long-term and iterative process. The strategy should be flexible to accommodate changes and include periodic evaluations to monitor progress, assess gaps and identify changing conditions. Monitoring entails an ongoing "learning by doing" process. While developing and implementing a DRR and resilience strategy, actors gather new information, co-produce knowledge and feed this back to the strategy, allowing for facing future risk and disasters.

WHEN DESIGNING THE MONITORING STAGE, REMEMBER TO:

- **Define, in a participatory manner, short, medium and long-term goals;**
- **Include a timeline with key outputs and milestones;**
- **Identify or develop a set of indicators and establish benchmarks;**
- **Monitor progress over time to gauge how the strategy is fulfilling the vision;**
- **Adjust the strategy as necessary; goals can be revised and adjusted.**

Monitoring progress helps broaden and deepen understanding of resilience and generates a valuable learning and discussion process between different local actors. It also contributes to the city-to-city sharing process.

SEE SECTION 6 - **CASE STUDY 8**
City-to-city networks contribute to ongoing learning and adjustment in the city of Santa Fe (Argentina).

USEFUL TOOLS

See the tools suggested in section 4.2 as the basis for starting a collective conversation about what to do, based on a shared diagnosis between different local actors. This should be an iterative exercise, repeated after specified periods of time and/or when circumstances change.

06

CASE STUDIES

BOX 9:

Summary of case studies

CASE STUDY 5.
Greater Manchester (UK)

Over the years, the metropolitan area has developed and continuously updated its resilience strategy, underscoring three key requirements to keep the process evolving:
1. understand local priorities;
2. understand changing risks;
3. continued engagement of politicians and senior leadership.

CASE STUDY 9.
Manizales (Colombia)

A best practice case study, Manizales offers an example of an array of mechanisms to secure financial resources for local DRR initiatives.

CASE STUDY 8.
Santa Fe City (Argentina)

The city showcases a local DRM process in the absence of provincial and national frameworks. A risk communication programme, downscaled monitoring and reporting, leadership in city networks and ongoing learning and transformation are some of the key dimensions of this experience.

CASE STUDY 1.
Campinas (Brazil).

The Making Smart Cities initiative provides an example of collaboration between the private and public sectors, enabling partner cities to significantly maximize the potential of their investments and the reduction of urban risks by using analytical and decision-making support tools.

CASE STUDY 6.
Kampala (Uganda).

The case study shows how city authorities have been developing a strategy to strengthen city resilience to hazards and highlights the main challenges in the context of climate change and rapid urbanization.

CASE STUDY 4.
Marunda, Jakarta (Indonesia).

A multi-stakeholder platform was set up to address various risks and to build resilience. Participatory mapping, improvement of livelihoods and behavioural changes are among the actions undertaken.

CASE STUDY 7.
Makati City (Philippines).

The case study illustrates how DRM is structured across different city scales and sectors. Partnerships with various international and local organizations, government agencies, community-based organizations, academia and professional associations have been key to this process. Legislation and policies provide the legal basis to mainstream DRR in local development plans and budgets.

CASE STUDY 3.
Kuroshio town (Japan).

A well-thought participatory process has transformed a ‘nothing-can-be-done’ attitude into a proactive approach: citizens have developed tsunami evacuation routes and shelters, and different forms of routine training are in place.

CASE STUDY 2.
Kullu district, Himachal Pradesh (India).

The engagement of the local community has helped develop mechanisms to ensure co–benefits between response to fire hazards, improved accessibility and access to drinking water.

CASE STUDY 1
CAMPINAS (BRAZIL)

Collaboration between the state and the private sector: the Making Smart Cities initiative

The city of Campinas plays a central role in the southeast region of Brazil due to its size, economic capacity and its initiatives and catalyst potential. It is also internationally recognized as a role model by the Making Cities Resilient campaign for its DRR-related activities.

Create a city that is more resilient to any type of urban risk – not only floods and landslides, the main natural hazards in the region – and to bring DRR to a new level. This was the aim when AI Systems Research's (AISR) CEO and representatives of Campinas Civil Defence held a series of meetings to establish a baseline project through the Making Smart Cities initiative. The project covers the city of Campinas and its metropolitan region – 20 towns and cities and over 3,700 km² – and affects around three million people. The metropolitan scale reflects the close interrelation between the region's towns and cities.

Making Smart Cities is a corporate social responsibility initiative of AISR, a Brazilian software company, and is recognized by the UN. It was presented at the 3rd UN World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Japan. The goal is to make cities more intelligent, resilient and sustainable by supporting the development and implementation of integrated strategies and planning. It aims to do this by enabling partner cities to significantly maximize the potential of their investments and the reduction of urban risks through the use of analytical and decision-making support tools, provided at no cost, to achieve a culture of proactive risk management in public policies. It integrates, in the process of developing strategies and planning, different UN international agreements (e.g. the Sendai Framework; Transforming Our World: the 2030 Agenda for Sustainable Development; the Paris Agreement on Climate Change; the New Urban Agenda - Habitat III; and the Agenda for Humanity - World Humanitarian Summit).

The initiative is structured around three pillars, which aim to support local governments in the following challenges:

1. Risk management-Identification, understanding and management of any type of urban risk, based on an analytical approach.

2. Socio-economic development - Assessment and reduction of socio-economic impacts related to urban risks. It also allows analytical management of socio-economic development programmes, socio-territorial analysis and community monitoring.

3. Environmental management - Assessment and reduction of environmental impacts related to urban risks. It also allows analytical management and monitoring of environmental programmes.

In this way, it is possible to improve resilience not only to natural disasters, but also to any type of urban risks by considering the related social, economic and environmental impact.

Understanding the city context and the interactions within and outside the city is of fundamental importance to identify and to manage urban risks and improve the city's resilience. But the dynamism of the context and its interactions mean that the analysis of past and current situations, patterns and behaviours are not sufficient for effective management and resilience improvement. It is also necessary to analyse future trends. The long-term approach encourages the local government to reflect on how the city should be in the future, within a certain time horizon, and what must be done to achieve this vision.

Campinas Civil Defence has adopted an analytical management approach for strategies, planning and actions for DRR. International agreements are already integrated into the DRR policy and the use of interactive risk maps is widespread.

MAIN CHALLENGES:

- To achieve proactive risk management for DRR.
- To infuse a culture of analytical management in public policies.

USEFUL LINKS:

Making Smart Cities
http://www.makingsmartcities.org/

RELEVANT LITERATURE:

Britto, Fernando P. "Smart Cities: Resilience and Private Sector" Smart Cities: why, for whom? Estação das Letras, 2016. 78-93.

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CASE STUDY 2

KULLU DISTRICT, HIMACHAL PRADESH (INDIA)

Addressing everyday needs through a local DRR and resilience strategy

Himachal Pradesh, a hilly state in the northern part of India, is very scenic but has a challenging terrain, highly prone to hazards such as earthquakes, landslides and fires. In recent years, there has been a shift from a response and relief-centric approach to a proactive and comprehensive paradigm of disaster risk management. Following the guidelines of the National Disaster Management Act (2005), Himachal Pradesh developed a State Disaster Management Plan (2012), which was revised in 2017 to align it with three landmark international agreements, namely:

- The Sendai Framework for Disaster Risk Reduction 2015-2030
- The Sustainable Development Goals 2015-2030
- The Paris Agreement on Climate Change

The policy underlines the nexus between disaster and development and emphasizes a multi-pronged approach for risk prevention and mitigation by:

a) Incorporating elements of mitigation and risk reduction into all development projects and programmes;

b) Initiating state-level mitigation projects in accordance with the guidelines issued by the National Disaster Management Authority (NDMA) for various hazards in high priority areas, with the help of government departments and agencies;

c) Developing a culture of safety and safe practices in the state;

d) Integrating DRR into development plans, policies and projects;

e) According high priority to projects contributing to vulnerability reduction, particularly in urban areas;

f) Giving due weight to indigenous knowledge about disasters and coping mechanisms.

Kullu district in Himachal Pradesh is famous for its tourist attractions and most of its vernacular buildings, such as traditional houses, castles, museums, etc., are built using timber and stone. These structures are quite prone to fire, especially during the winter months when fodder and wood are stored. As houses are built close to each other, fire can quickly spread.

Many villages in this hilly region are not connected by road, while others are connected but the roads are too narrow to accommodate large fire tenders. The dispersed and scattered nature of settlements – away from roads, on top of hills or deep in the valleys – renders communities highly vulnerable in the wake of disasters. According to the Public Works Department (PWD), there are 17,449 villages in Himachal Pradesh, of which 7,236 cannot be accessed by road. The average distance of inaccessible villages from the nearest motor-able road is 5.17 km in areas of high hills, 2.06 km in the low hills and 1.41 km in plain and valley areas. According to conclusions reached during the development of the Himachal Pradesh State Disaster Management Plan (SDMP-2012), the Kullu district administration was ill-equipped and inadequately trained to deal with disaster situations. The absence of an organized mechanism for response was generally felt at times of crisis (SDMP-2012). There are disaster management plans, but they have not proved to be practical or useful at times of crisis.

On November 14, 2015, in Kotla – a village located in the interior of Kullu district – a fire broke out, gutting at least 72 houses (mostly wooden), causing over US$3 million in damages, and destroying an ancient temple of a local deity, Chhamahu Devta, which had very high heritage significance for local people. District administration officials deployed fire-fighting vehicles to the disaster site. This village is situated in a remote area on top of a hill. Fire tenders stationed near the village could not reach it because the approach road was very narrow. After the incident, district and state administrations decided to construct a drivable road to improve the village's accessibility. However, movement of heavy vehicles, such as fire tenders, is still not easy in this difficult terrain.

Another problem was the lack of a local water source, which made it difficult to provide water for extinguishing fires, further increasing vulnerability. To address this issue, the local community constructed several small water tanks near the village, with the help of the government. Nowadays, they use this water for their daily basic needs and for storage for extinguishing fires. The state Department of Irrigation and Public Health (IPH) is also maintaining an underground water tank (capacity of 7,000 litres) near the village to store water. The state government, through the IPH Department, has also proposed a local project for preparedness and mitigation of fire risks. This project plans to construct a water lift to carry water to the village from the river in the valley below.

RELEVANT LITERATURE:

Himachal Pradesh State Disaster Management Plan, 2012 & 2017

Dave, B., Thakkar, J., & Shah, M. (2011). Prathaa: Indigenous building traditions of Himachal Pradesh (1st ed.). Ahmedabad: SID Research Cell.

District Disaster Management Plan (DDMP-2017), Kullu.
http://hppwd.gov.in/village%20connectivity.htm
(Himachal Pradesh PWD Website)

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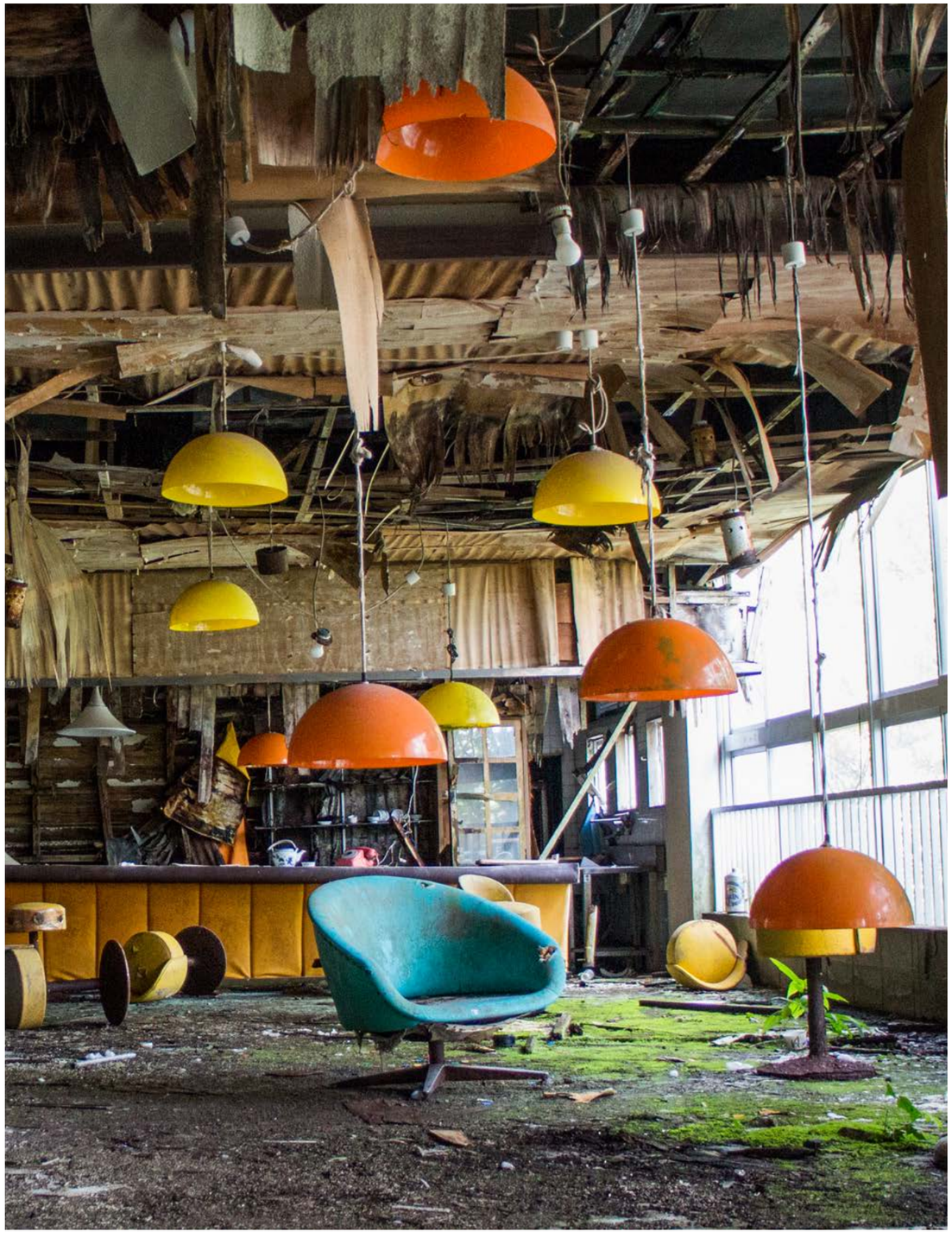


CASE STUDY 3

KUROSHIO TOWN, SHIKOKU REGION (JAPAN)

Formulation of a practical local disaster risk reduction plan: Kuroshio town against tsunamis

Cooperation between local government and community in tsunami countermeasures

Kuroshio, located in the western Shikoku region of Japan (Figure 1), is a small town of about 11,000 residents. It faces the Pacific Ocean and the Nankai Trough and has suffered great earthquakes on average every 100 to 200 years. Kuroshio is recognized as suffering tsunami and flood risks.

Following the great east Japan earthquake of March 2011, the Japanese Government carried out a fresh Nankai Trough earthquake and tsunami simulation (March 2012). The simulation showed that Kuroshio town might be hit by a tsunami surge up to 34.4 metres high (Figure 2). In addition, the Government saw an 70-80% probability of an 8.0–9.0 Mw earthquake within the next 30 years in the Nankai Trough. It estimated that the death toll in Kuroshio could be 2,300 (21% of the population) and that all residents would become evacuees. This information had a negative impact on residents who commented, “The town will disappear” or there is “Nowhere to escape to”. There was a widespread sentiment of resignation.

Residential areas of Kuroshio are growing in tsunami flood risk areas along the coast. Enforcing land-use restrictions would involve substantial re-locations, but there are not enough suitable areas to do so. Also, there are many areas other than Kuroshio town which are expected to suffer heavy damage by a tsunami. Due to budget limitations, it is not realistic to implement structural measures, such as tidal banks along the shoreline, which need large investments. For this reason, Kuroshio concentrated on developing an evacuation system and on building tsunami evacuation towers.

Kuroshio town officials believe that if residents survive, so will the town. They have started revising the local DRR plan based on three important pillars: (1) strong leadership from the mayor; (2) work by the town office; and, (3) residents’ and community efforts. “Don’t give up; flee quickly to a safer place if a quake is felt,” was the motto to be embraced by all residents.

Six tsunami evacuation towers were constructed in areas that lacked any high ground to which people could escape. To achieve this, Kuroshio negotiated financing with the national and the prefectural governments.

Kuroshio’s DRR section only had seven officials, so the town decided to assign all its 200 officials to the town’s 61 districts for DRR liaison. Officials and the community have conducted workshops on hazard mapping. They have agreed 168 evacuation sites and 295 evacuation routes, and the necessary preparation work has been undertaken. The workshop has been conducted more than 150 times, with a total of 4,600 people participating.

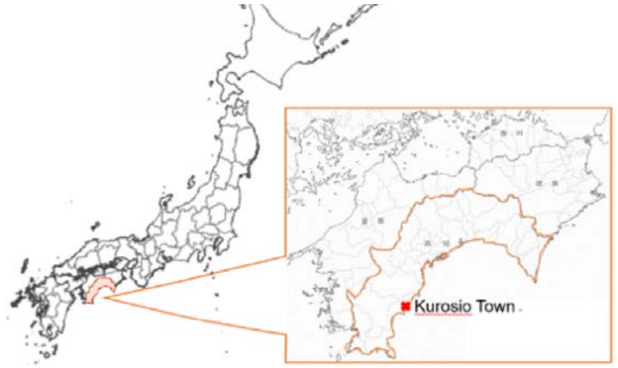
Based on the trust developed between the local government and the community, Kuroshio town created an “individual tsunami evacuation chart”. This will prepare an evacuation plan for all 3,791 households in areas where a tsunami flood is expected. Evacuation drills are regularly carried out and 4,298 people – equal to 37% of all residents, from children to the elderly – participated in a comprehensive evacuation drill in 2017.

Lessons of the case study

Several lessons can be drawn from the Kuroshio town case study. A tide breakwater that alleviates certain levels of damage might be effective, but it might not be possible to implement due to high costs and budget constraints. Therefore, it is appropriate to reduce damage through non-structural measures, such as (1) land use-regulations and (2) improving evacuation methods.

Nagoya city (Aichi prefecture, Japan) was hit by the Ise Bay typhoon in 1959, when a storm surge caused 5,098 victims. It subsequently defined four zones and enforced restrictions on the height of the first floor compared to sea level and on building design (Figure. 3). Kamaishi-shi (Iwate Prefecture, Japan) was heavily damaged by the Sanriku-Oki earthquake of 1933. The community relocated (Figure 4), but the area was still hit by the 2011 tsunami. The relocated community escaped serious damage, although newly built houses in lowlands were affected (Figure 5). It will be necessary, therefore, to enforce land-use regulations that restrict construction in areas with high disaster risk.

FIGURE 1
Location of Kuroshio town, Kochi, Japan

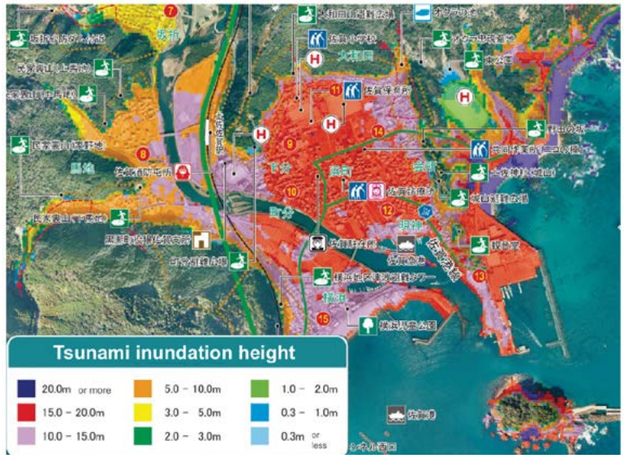


Local governments and communities need to confirm and maintain evacuation sites and evacuation routes and carry out periodic evacuation drills. Evacuation facilities should be constructed by the national government (there are some examples, such as tsunami evacuation towers in Indonesia and cyclone shelters in Bangladesh).

In the case of Kuroshio, the priority has not been structural countermeasures, such as tidal banks along the shoreline, because its main risks are associated with tsunamis, and geographical and social conditions make structural measures ineffective. Such measures require huge investments that the local government cannot afford. Even though the national government usually takes responsibility for structural measures to protect critical infrastructures, local DRR plans should also include some structural measures and an investment plan.

Following a Japan International Cooperation Agency (JICA) partnership meeting in Nov. 2017, the JICA co-created the "Practical guide for developing local DRR plans 2" based on an exchange of opinions with central DRR organizations, financial and planning ministries and local government DRR bureaux in developing countries. This guide adopts a simple and practical eight-step method to promote the global target (E) of the Sendai Framework to "Substantially increase the number of countries with national and local DRR strategies by 2020" (see https://www.jica.go.jp/english/news/field/2017/c8h0vm0000bqnqel-att/practical_guide.pdf Local DRR plans should be developed as early as possible in areas with high disaster risks and this guide can serve anywhere as a useful tool to reduce future disaster risks and damage.

FIGURE 2
Tsunami hazard map of Kuroshio town (Kuroshio town, 2014)



RELEVANT LITERATURE:

1. Yoshikawa Tadahiro, 2011. Chapter 2 "Vulnerability" in ground disaster and possibility of land-use regulation, Study on Vulnerability and Resilience for Increasing Sustainability of Local Communities.

2. Global Environment Department Disaster Risk Reduction Group, 2018. Practical Guide for developing Local DRR Plans toward 2020, Japan International Cooperation Agency (JICA), Tokyo, Japan.
https://www.jica.go.jp/english/news/field/2017/171109_01.html
https://www.jica.go.jp/english/news/field/2017/c8h0vm0000bqnqel-att/practical_guide.pdf

FIGURE 3
Example of land-use and building regulation (Nagoya city: Sep, 2008)

Zone	1st floor height above Nagoya water level	Design restrictions
1	> 4m	Wood structures prohibited
2	> 1m	Occupied rooms must be on 2nd floor or above, but restrictions reduced if one the following applies: a. At least one room on 1st floor is at least 3.5 m above Nagoya water level; b. A structure on same site is at least two stories high; c. Building totalling 100m2 or less have an evacuation room or evacuation equipment
3	> 1m	None
4	> 1m	Occupied rooms must be on 2nd floor or above, but restrictions reduced if one the following applies: a. At least one room on 1st floor is at least 3.5 m above Nagoya water level; b. A structure on same site is at least two stories high.

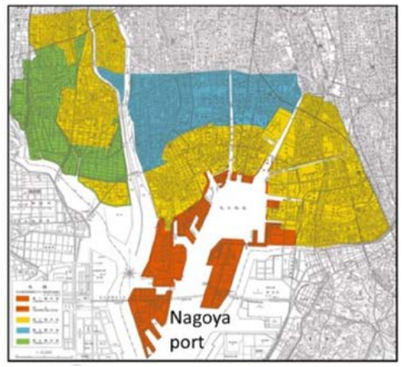


FIGURE 4
A case of community relocation at Kamaishi city in 1933 (Yoshikawa, 2011)

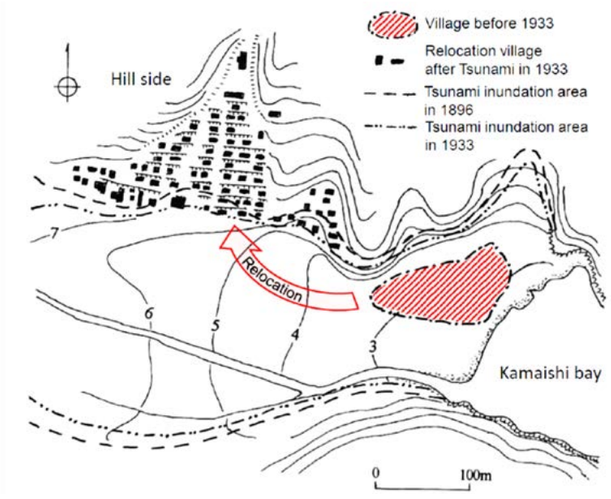


FIGURE 5
Tsunami inundation area in Kamaishi city (Geospatial Information Authority of Japan, 2011

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CASE STUDY 4

MARUNDA, JAKARTA (INDONESIA)

Marunda urban resilience in action (MURIA). Scaling up

Problems faced by the Marunda community

Marunda is a flood-prone coastal area in North Jakarta. The underlying chronic stresses of flooding in Marunda are related to limited opportunities for income generation, inadequate waste management and drainage systems, a deteriorated sanitation system and destruction of natural flood protection from mangroves. All of these problems are exacerbated by alarming rates of land subsidence.

At greatest risk are those households living in extreme poverty in direct proximity to the coast and waterways. Some 38% of the sub-villages of Marunda have a household income of less than two euros per day. In Jakarta, one million people live in most-at-risk districts along the coastal strip of northern Java. Other cities in Indonesia and Asia face similar challenges to those faced by the community in Marunda.

Marunda has local, longer-term inhabitants as well as groups of newcomers they call the 'flat community'. Local fishermen's families in the inundated areas live in shacks lacking basic facilities. The 'flat people' are families that were evicted and relocated to big social housing flats. They used to live illegally alongside rivers and other places in Jakarta, having nowhere else to go to. The flats they live in now are more comfortable, but many cannot afford the rent and are cut off from the places where they previously made a living. Many people in Marunda cannot stand up for their rights because they have been unable to meaningfully participate in and contribute to city development plans.

But Cordaid's urban resilience programme in Jakarta is bearing fruit. Hundreds of impoverished families on the city's heavily polluted and sinking northern coast have now taken up urban farming, claimed their rights, and are actively fighting the effects of pollution and climate change. Jakarta's deputy governor, inspired by Cordaid's approach, invited the relief organization to contribute to the city's urban farming policy plans.

"By being actively involved in this programme, our knowledge and confidence are increasing. I gain additional income from growing vegetables. I also participate actively in waste bank and saving and loan activities. All of these experiences mean that women are no longer dealing with loan sharks." (Warni, Marunda community member)

FIGURE 1
One part of Marunda slum area which is prone to flood and coastal inundation with limited urban ecosystem support

Design of a possible solution for Marunda

In May 2015, Cordaid implemented through KARINA Yogyakarta a participatory urban neighbourhood appraisal (PUNA), attended by both community members and local government, to analyse hazards and assess risks.

During the PUNA four solutions were identified to build resilience in Marunda:

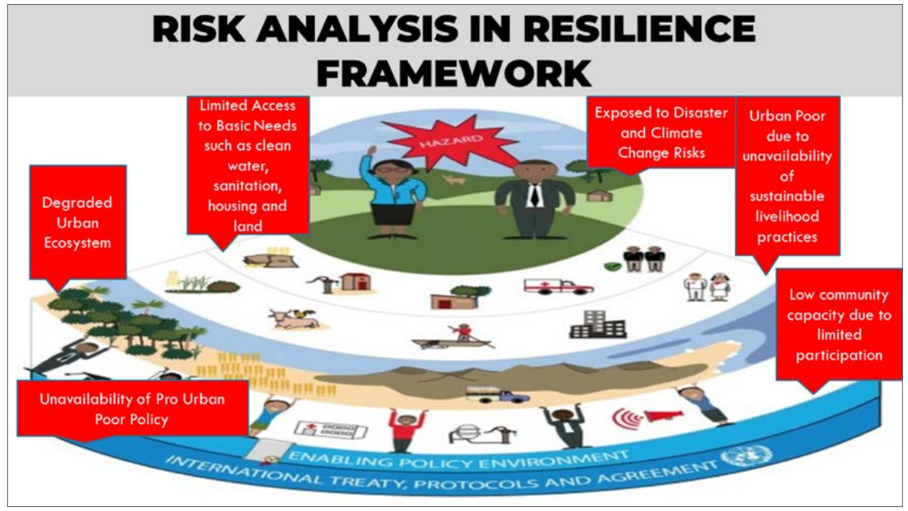
- Create a multi-stakeholder platform for the community to participate in Marunda development plans.
- Increase the community's capacity to minimize flood risks through mapping.
- Increase community livelihoods through urban farming.
- Promote behaviour changes in hygiene and sanitation.

SOLUTION 1

MULTI-STAKEHOLDER PLATFORM FOR COLLABORATION IN ADDRESSING VARIOUS RISKS

The Marunda urban resilience in action (MURIA) platform was established to carry out the identified solutions, with the support of KARINA Yogyakarta and Bina Swadaya Konsultan (BSK) and funding from Cordaid and the Ford Foundation Indonesia.

FIGURE 2
Lens of Cordaid's resilience framework used to analyse the risks in Marunda



This platform consists of different stakeholders – the Marunda community, the private sector and government and non-governmental organizations (NGOs). Its main objectives are to highlight the community's situation and create the conditions for different stakeholders to work together in building resiliency. It applied an integrated risk management approach to disaster risk reduction, combined with climate change adaptation and environmental resource management.

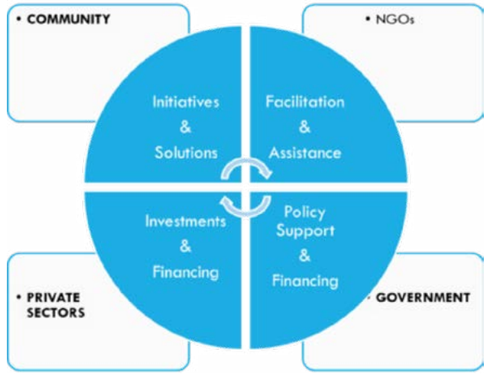
The MURIA platform developed working groups to tackle the problems faced by the Marunda community, bringing together all community elements and facilitating discussion and planning among platform members.

SOLUTION 2

PARTICIPATORY MAPPING FOR SUPPORTING LIVELIHOODS AND FOR DISASTER PREPAREDNESS

The digital mapping of the Marunda area was supported by Humanitarian OpenStreetMap Team (HOT) and was implemented in cooperation with Marunda youth. Slum dwellers, many of them women, were trained to map their neighbourhoods, street by street. They can now show the government how and where they live, that electricity and drinking water are lacking, and how many times their houses are flooded.

FIGURE 3
Collaboration in the MURIA platform

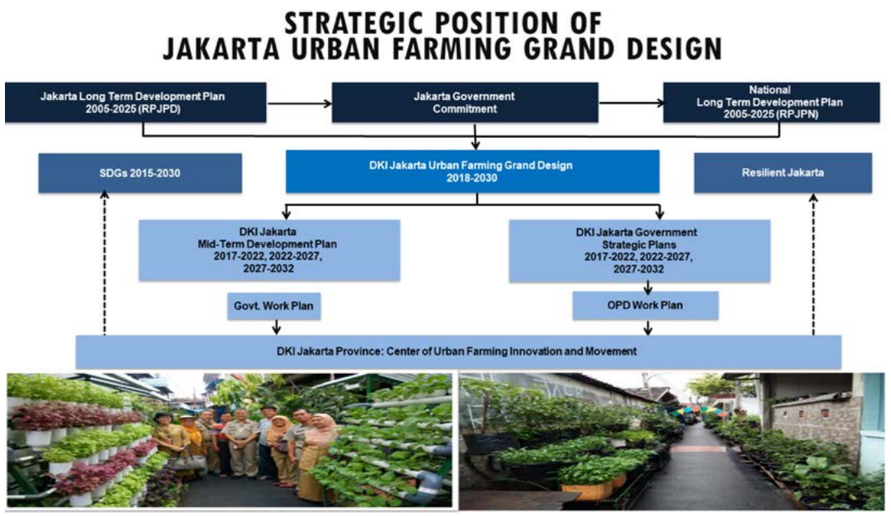


SOLUTION 3

INCREASE COMMUNITY LIVELIHOODS THROUGH URBAN FARMING

Local fishermen and newcomers alike suffer from job insecurity and have a hard time feeding their families. The urban gardening project provides food as well as an income. The applied urban farming was technically supported by PT East-West Seed Indonesia (EWINDO) and Yayasan Bina Tani Sejahtera. It offered quick wins to overcome the livelihood problem and also invited the community to start managing the environment. This initiative became the strategy for gaining community interest in the whole programme.

FIGURE 4
Strategic position of Jakarta Urban Farming Grand Design 2018-2030



SOLUTION 4:

PROMOTE BEHAVIOR CHANGES: HYGIENE AND SANITATION

Waste management was introduced by establishing waste bank groups – where locals can earn from recycling their waste – and communal businesses based on saving and credit. As many as 800 families were trained in improving sanitation and hygiene at home and encouraged to hold city officials accountable when they spot cases of bad waste management in their streets.

To provide safe drinking water, Cordaid set up rain-water harvesting initiatives in Marunda. Families are now collecting and filtering rain water and can quickly and easily test whether it's safe to drink.

FIGURE 5
Integrated risk management is at the centre of the Jakarta Urban Farming Grand Design 2018-2030 project to address major problems in the greater Jakarta area

Scaling up MURIA to Greater Jakarta through city policy dialogue

The MURIA project is an innovative model for public-private partnerships in urban resilience. Authorities rom other cities can endorse the model and solutions proposed and replicate them in their cities.

The urban farming initiative helped the MURIA platform gain the trust of the DKI Jakarta province and led to an invitation to help create Jakarta's Urban Farming Grand Design.

The 2018-2030 Urban Farming Grand Design was developed in collaboration with Partners for Resilience Strategic Partnership Indonesia, Jakarta's provincial Food Security, Marine and Agriculture Agency (DKPKP) and the office of the Jakarta Deputy Governor for Spatial Planning and Environment. The Grand Design will scale up the platform and urban farms in greater Jakarta over the next 13 years. It is based on the principles of integrated risk management and the fundamental objective of MURIA – to strengthen community livelihoods and multi-stakeholder collaboration.

In July 2017, the Cities Alliance named the urban farming project one of the five best examples of an integrated approach to the follow-up and review process for global sustainability agendas. In addition, the project was presented as an example of community involvement at the opening panel of the 2018 Adaptation Futures conference in Cape Town, South Africa, which was attended by over 2000 people.

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CASE STUDY 5

GREATER MANCHESTER (UNITED KINGDOM)

A resilience approach for a city region

Greater Manchester (GM) has a population of over 2.71 million and is home to over 93,000 businesses offering 1.14 million jobs. Its economy generates £48.2 billion (2011 figures), greater than the economy of Wales or Northern Ireland. The city region is made up of 10 local government areas and coordinated work ensures resilience is aligned with critical collective policy areas.

Fundamentals for a local DRR and resilience strategy

Over the years, Greater Manchester has developed and refreshed its resilience strategy. Although leaders take many factors into account, there are perhaps three key requirements if the resilience strategy is to contribute to DRR and resilience work and to drive change:

- An understanding of GM's priorities – for local communities, the local economy and the locality. For example, GM has negotiated an historic deal with the UK government which allows powers to be devolved from national to local level, giving greater autonomy over the decisions that affect local communities. This allows GM to change how it does things, placing resilience at the heart of the transformation process;
- An understanding of changing risks, whether from climate change, urban growth, anti-microbial resistance or cyber-related crime;
- Continued engagement of politicians and senior leadership as they create and drive forward the vision for GM's future.

Developing and implementing a local DRR and resilience strategy

The development and implementation of a resilience strategy in GM has been an iterative process that has built steadily on over a decade of partnership and collaboration. The resilience strategy can trace its roots back to 2004 when new legislation was introduced across England (Civil Contingencies Act 2004) that encouraged the creation of local multi-stakeholder partnerships to coordinate DRM across different sectors. The Greater Manchester Resilience Forum (GMRF) was established, initially under the chair of the police service and latterly the fire service. It has met quarterly for over a decade. Through this forum strategic leaders come together to coordinate and drive forward resilience activity on a multi-sector basis across the city, including commissioning the GM resilience strategy.

GM resilience strategies have guided multi-stakeholder activities since 2009. The first resilience strategies were informed by:

- A detailed multi-agency risk assessment to enable proportionate planning and investment in capabilities that reflected the risks faced, including flooding, pandemic flu and industrial accidents;
- A biennial assessment of the capabilities (e.g. plans, trained staff, equipment and vehicles) in place to address the common consequences that may arise from many of the risks, such as casualties and fatalities, displaced people, care for vulnerable people and site clearance;
- National regulations and guidance, which, in part, ensure that a wide-area emergency that crosses administrative boundaries can be dealt with effectively using a set of shared principles that include: developing an understanding of what's happening on the ground; command and control of resources and; integrating the efforts of different responders to give the best possible response;
- Learning from incidents and emergencies, both locally and further afield.

FIGURE 1
Greater Manchester Resilience Forum

The process has evolved and become more sophisticated. In 2014 GM joined the UNISDR Making Cities Resilient campaign and became a global role model for DRR. Participating in the campaign gave local stakeholders the opportunity to reflect on, broaden and deepen their resilience work, as well as learning from other cities across the world. It was also a catalyst for greater engagement with other multi-stakeholder groups within GM´s governance structures that work, as part of wider agendas, on addressing disaster risk.

The GMRF, although in itself a partnership of over 100 agencies, recognized the opportunities to influence and inform other city-wide agendas, including those related to infrastructure investment and to protecting the natural environment. The forum now has a wider and more encompassing view of disaster risk reduction, working alongside many local cross-sector partnerships including:

- Greater Manchester's Infrastructure Advisory Group (informing Greater Manchester's strategies on strategic infrastructure issues)
- Chief Planning Officers Group (integrating activity on land-use planning)
- Flood and Water Management Group (taking a holistic approach to water management and flood risk)
- Natural Capital Group (working to protect and enhance Greater Manchester's natural green and blue assets)
- Local Health Resilience Partnership (facilitating health sector resilience and preparedness)

In 2016 GM joined the Rockefeller Foundation's 100 Resilient Cities network. Through this initiative GM is challenged to take a new look at resilience. This process will rewrite GM´s resilience strategy again and continue to make it relevant to the city's future.

Frameworks and tools for localizing DRR and resilience

After joining the Making Cities Resilient campaign, Greater Manchester completed the campaign's Local Government Self-Assessment Tool (LG-SAT). Through a series of multi-stakeholder analyses and discussions, the process encouraged stakeholders across different sectors to take a new perspective on all Ten Essentials for making cities resilient. It also deepened their thinking around their understanding and ability to influence disaster prevention and risk mitigation.

In 2015, the city region was given the opportunity to join cities from Sweden and Portugal in an EU-funded project to pilot a City Disaster Resilience Scorecard. Developed by AECOM and IBM as a free tool to support cities in the UNISDR Making Cities Resilient campaign, the scorecard enables cities to measure their resilience against 90 indicators and align themselves with the campaign's Ten Essentials. Through this work, GM could both understand what was done well and identify areas where further work was required. Outcomes led to a review of resilience approaches and offered another opportunity for GM to look at how it invests in resilience, works together across agencies to mitigate risk and engages communities in understanding risks and preparing for emergencies, together with exploring emergency responses.

Since joining the Rockefeller Foundation's 100 Resilient Cities network, the city has been working on implementing the City Resilience Framework to take a fresh approach to shocks (sudden emergencies) and stresses (chronic, underlying issues that diminish the capacity of the city to absorb and recover from shocks).

USEFUL LINKS:

UNDRR Making Cities Resilient campaign – Greater Manchester
https://www.preventionweb.net/english/professional/policies/v.php?id=38900

Greater Manchester Prepared
http://www.gmemergencyplanning.org.uk/gmprepared/site/index.pp

Greater Manchester Resilience Forum (Twitter feed): @GM_prepared

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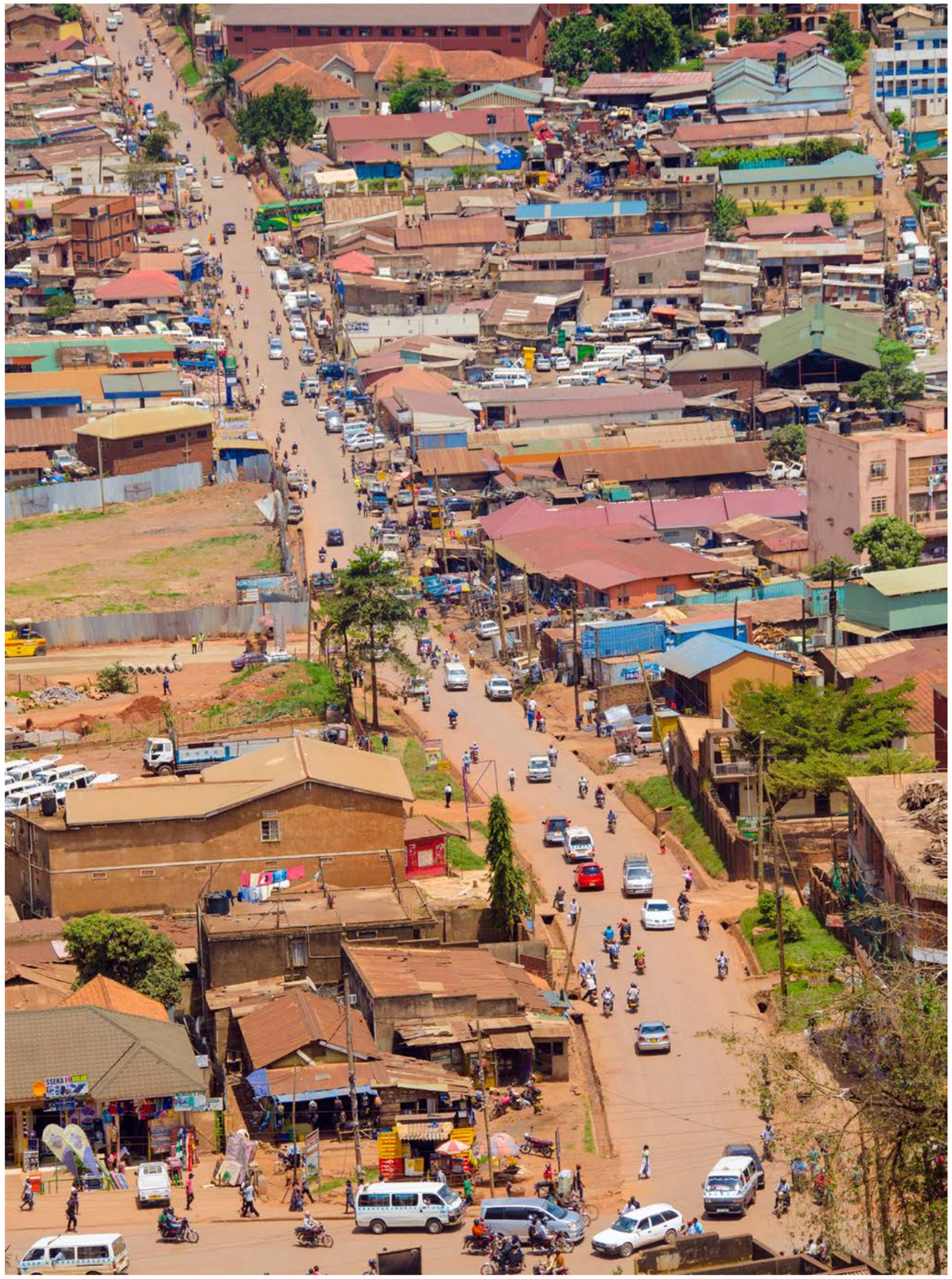

CASE STUDY 6

KAMPALA (UGANDA)

Challenges in developing an integrative resilient strategy

Kampala is a fast-growing and dynamic city and regional centre, accounting for 80% of Uganda's industrial and commercial activities. Uganda has the 14th lowest income of any country in the world and one of the youngest and most rapidly growing populations. It is expected that Uganda's population will double between now and 2050. Kampala city has an annual population growth rate of 5.2%, according to the Ugandan Bureau of Statistics, and, consequently, demand for land in Kampala is increasing at a rapid rate. The current population is about 3.5 million, but it is expected that it could reach up to 10 million by 2040.

Kampala's geography is defined by plateau hills that are surrounded by wide valleys with wetlands; the outskirts of the city border on Lake Victoria. The city is characterized by urban sprawl and increased growth of informal settlements due to inadequate land-use planning. The city is highly vulnerable to climate-induced disasters, including floods and landslides, as well as fire and disease. Frequent, high-intensity tropical rainstorms generate extremely high run-off that quickly exceeds the capacity of the urban storm water drainage system. The recurrence of flash floods in Kampala, with a usual duration of several hours to at most two days, is a major disruption to the lives of Kampala's citizens and entails high economic and social costs. The combination of higher temperatures and changes in Lake Victoria's water level encourages the spread of vector-borne diseases, especially malaria. On the other hand, periodic rainfall reductions and contamination of freshwater sources mean the cost of clean drinking water is rising.

Authorities in Uganda's capital have been developing strategies to strengthen the city's resilience to natural and man-made hazards. The Kampala Capital City Authority (KCCA) and development partners allocate a significant percentage of the city's annual budget to revamp road infrastructure and drainage channels. They work with civil society organizations, such as the Ugandan Slum Dweller's Federation, on waste management and on planning and construction of tributary drainage in informal settlements.

KCCA is implementing a low emission and climate change resilience strategy known as the Kampala Climate Change Action Plan which builds on the Kampala City Strategic Plan (2014-2019). Since 2011, Kampala has been a member of the UNISDR Making Cities Resilient campaign and the KCCA has undertaken a number of risk-profiling exercises, including UNISDR's Local Government Self-Assessment Tool (LG-SAT). KCCA is also currently undertaking a resilience study aimed at establishing risks and hazards in various communities and priorities for action.

These assessments have brought up many challenges, which the city is aiming to address through its strategies. These challenges include:

- The city's revenue streams are poor, which means that it is not able to invest enough in the required infrastructure.
- There is a weak regulatory framework and poor land-use planning, so KCCA is not able to regulate much of the development that is happening in the city. When there are issues that require enforcement, political figures get involved rather than let them be treated as technical questions.
- Land-use, environmental and other policies are not coordinated with the climate change agenda.
- All new infrastructures must take into account the risks, including those from climate change.
- There is a lack of incentives for the private sector to invest in risk reduction and emissions reduction; the city is telling them to invest, but incentives are needed.
- There is a need to improve basic infrastructure systems, including putting into place more drainage systems, solid waste management and sewerage, as well as prioritize landscaping and green areas for water absorption.
- The authorities must continue to communicate with and encourage local stakeholders to participate.

RELEVANT LITERATURE:

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UN-Habitat, 2009. Climate Change Assessment for Kampala, Uganda: A Summary. UN-Habitat Cities and Climate change Initiative. Available at: https://unhabitat.org/books/climate-change-assessment-for-kampala-uganda/

UN-Habitat, 2013. Flood Risk Assessment, Strategies and Actions for Improving Flood Risk Management in Kampala. UN-Habitat Cities and Climate Change Initiative.

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CASE STUDY 7
MAKATI (PHILIPPINES)

A disaster risk reduction management system

The Makati Disaster Risk Reduction and Management Council (Makati DRRMC) and the Makati Disaster Risk Reduction and Management Office (Makati DRRMO) were established in 2012. However, Makati City already had pioneering DRRM units, like the Makati Rescue (1992), Makati Command, Control and Communication (Makati C3) (2000) and the Makati Emergency Medical Services System (MEMS). At the community level, all of the city's 33 barangays (smallest administrative unit in the Philippines) have established their respective barangay DRRM committees (counterpart to the Makati DRRMO).

The Makati DRRMC was made as multi-sectoral as possible. It is comprised of representatives from the city and the Philippine Red Cross – Makati, civil society organizations, faith-based organizations, professional associations, academia and the private sector. This helps ensure a more holistic, comprehensive, consultative and proactive approach to DRRM initiatives and activities. As main coordinating body and secretariat of the DRRMC, the Makati DRRMO is responsible for organizing and setting the direction of the city's DRRM initiatives.

Through the Makati DRRMC and the barangay DRRM committees, relevant laws and policies are enacted to provide legal bases for the efforts of the city government and the barangays in mainstreaming DRR in local development plans and budgets. The Philippine Disaster Reduction and Management Act of 2010 allocates at least 5% of the city's total revenue to a Local Disaster Risk Reduction and Management Fund.

FIGURE 1
Makati DRRM structure and partners

Disaster preparedness programmes take 70% of the funds and the remaining 30% goes towards quick response and recovery and rehabilitation.

The Makati DRRMC and DRRMO have been working along two important lines:

1. Access to accurate information
2. Gender mainstreaming in DRRM

Access to accurate information: REDAS application

Accurate information is crucial for making timely decisions for relief operations, allocating resources and manpower and informing the public. Recognizing this, the Makati DRRMO, in partnership with the Philippine Institute of Volcanology and Seismology (PHIVOLCS), conducted training in 2016 on the rapid earthquake damage assessment system (REDAS). REDAS is a software that can produce a simple and user-friendly simulation of possible seismic hazards for inferring the severity of impact on various elements at risk. City disaster managers can use the software for quick, real-time hazard decision-making and science-based planning.

Makati intends to provide more accurate estimates of the impact of hazards, particularly earthquakes, through a localized understanding of exposure based on the soundness of building structures. To develop the city's exposure database, Makati DRRMO identified five *barangays* that represent all the land-use classifications present in the city. These are mixed land-use residential, commercial and purely residential. The city then conducted field surveys with trained volunteer surveyors from these *barangays*. To date, all 366 structures in Barangay Urdaneta and more than a 1,000 out of the 2,169 structures in Barangay Pio del Pilar have been surveyed. This has served as the initial input into the city's exposure database.

The initial training with PHIVOLCS created a pool of 27 city personnel from 14 city offices/ departments that can conduct risk assessments using the REDAS software. Makati DRRMO then replicated the REDAS training in the selected five *barangays*. Now there are 33 volunteer surveyors from the *barangays* and the Bureau of Fire Protection – Makati. Training will continue in all 33 *barangays*. Training builds the technical capacity of members and leaders of the community and helps raise awareness and encourages involvement and participation in the process of resilience building.

Gender mainstreaming in DRRM at the local level

The Makati DRRMC recognizes that gender mainstreaming is one of the many cross-cutting concerns present in DRRM and that it is important to consistently use a gender lens to ensure a more holistic approach to DRRM. Makati City partnered with various agencies to assess gender responsiveness of DRRM programmes and projects through the use of the gender and development (GAD) checklist for designing disaster risk reduction and management projects. The checklist is from the harmonized gender and development guidelines for project development, implementation, management, monitoring and evaluation developed by the National and Economic Development Authority (NEDA), Philippine Commission on Women (PCW) and the Official Development Assistance Gender and Development Network (ODA-GAD Network)

The GAD checklist encourages a gender perspective in programme and project development and management, including assessment of gender impact through sex-disaggregated data and gender-related information. It also aids assessment of plans in order to anticipate negative gender-related impact and minimize constraints and monitor indicators and targets to reduce gender gaps, improve women's participation and enhance women's empowerment. It considers gender analysis as a critical element of a gender-responsive programme/project. Analysis of the gender dimension can be at two levels, namely: 1) household and community level (considering gender roles of women and men and gender relations; access to and control of resources; risks, vulnerabilities, and needs; and constraints and opportunities) and 2) organizational/institutional level.

It also emphasizes the importance of identifying differentials, like status, needs and capabilities; roles and responsibilities of the two sexes; and access to and control of resources, benefits and opportunities. Environmental, political, social and cultural factors should also be considered. This is information that is usually left unconsidered and is difficult to identify without community consultation and validation.

Finally, it is worth noting that planners and disaster managers should know how and when to use these data and information.

USEFUL LINKS:

ODA-GAD Network
http://odagadnetwork.blogspot.com.ar/

GAD Checklist for designing disaster risk reduction and management projects
http://w3.neda.gov.ph/hgdg/main/DRR%20GAD%20Checklist%20FINAL%20(12%20Aug%202015).pdf

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CASE STUDY 8

SANTA FE (ARGENTINA)

Reflections on a 10-year urban DRM process

Located at an altitude of 18 metres above sea level, between the flood plains of the Paraná and Salado rivers, and with an annual average precipitation of around 990 mm, the city of Santa Fe de la Vera Cruz has been historically exposed to extensive and intensive fluvial and pluvial flood risk. A medium-sized city of approximately 400,000 residents – over half a million at the metropolitan scale – 70% of its territory is represented by rivers and swamplands.

In April 2003, the city was affected by one of its worst ever disasters: the flooding of the Salado river. The river broke an unfinished flood protection embankment and flooded more than one third of the city, affecting 120,000 people, killing 24 and causing millions of dollars in damages. In March 2007, heavy rains coupled with a flood defence system that impeded rainwater runoff caused damage once more. The city was cut off and 30,000 people were displaced from their homes for two months. The west part of Santa Fe, with the highest levels of socio-economic vulnerability, was the most affected during both events. Hazardous situations would hit the city again a few years later. However, this time the city would manage to withstand the situation with far fewer evacuated people and less material damage. In March 2015, heavy rains, comparable to those in March 2007, resulted in 900 people being temporarily evacuated to municipal shelters for five days. A year later, in April 2016, a combination of rain and extraordinary peak levels of both rivers affected 200 families (approximately 730 people), who had to seek refuge in municipal shelters.

Nowadays, Santa Fe is considered a "good practice" case study in international circles and is increasingly taken as an example by other cities and metropolitan areas in the country. Importantly, Santa Fe offers an example of a local DRM process that was initiated at the municipal level, despite a national and provincial approach that still focuses predominantly on emergencies, immediate response and, in a few cases, mid-term recovery.

First steps: DRM as local public policy

The city of Santa Fe was the first municipality to develop and implement an urban disaster risk management policy in Argentina. The local government has been able for over a decade not only to initiate but to sustain and, when necessary, to adapt a local disaster risk management process.

Santa Fe is not an exception where changes were triggered by disasters, but there was also the capacity of political leaders to "read the cracks". Affected residents organized around different collectives and mobilized to claim justice and compensation. Then an alternative political coalition made flood risk management a key electoral issue. After winning municipal elections in 2007, the coalition made disaster risk management a "state public policy" in its new urban development plan. Political commitment has been kept alive by political continuity (the same coalition has continued to win elections) and increasing support in mayoral elections from low-income electoral districts (historically, among the most exposed and vulnerable to urban flood risk).

A municipal ordinance was passed in 2008 creating a municipal DRM system, with a DRM office directly dependent on the mayor and with its own annual budget. Importantly, the public university had a key advisory role in designing the local DRM organizational and regulatory frameworks. Local experts from different areas (law, hydrology, urban planning and architecture) were brought together to advise the municipal government on different alternatives for moving from disaster management towards a more proactive approach. The UNISDR's Ten Essentials and membership of the Making Cities Resilient campaign also provided inspiration.

Since its creation in the municipal government structure, the DRM office has had a dual role. The office has had a specific role in preparedness for response, preparedness for recovery, response and immediate recovery. Its first task was to get ready to respond (both internally and externally) to hazardous events. This entailed the following actions: 1) development of overarching manuals of procedures for heavy rains and rising river levels; 2) development of specific internal action protocols by all areas in the executive department for both types of event; and 3) participatory design of evacuation plans, including selection of meeting points and temporary shelters, at neighbourhood and district levels. For all these, the DRM office has had an earmarked annual budget.

The DRM office also has a cross-cutting role in mainstreaming DRR in other sectors of the municipal government. This role has been facilitated by the formal inclusion of the director of the DRM office in regular cabinet meetings, the joint organization with one of the public universities of DRM training for municipal employees, and the strong linkage between the DRM office and the Department of Communications. The latter has been central for embedding the DRM approach internally and externally. Mainstreaming DRR across municipal departments has resulted in: 1) sectoral and integrated plans, programmes and projects targeted at reducing hazard, exposure and vulnerability (e.g. grey infrastructure for flood protection; green and blue infrastructure, including green corridors, reservoirs and urban natural reserves; waste collection and recycling; relocation and neighbourhood upgrading); 2) development and update of specific emergency protocols by department; and 3) permanent cross-cutting resources (e.g. since 2008, the Department of Water Resources has an annual budget for the operation and maintenance of the flood defence and pumping systems).

Clearly defining a DRM public policy has helped secure financing from higher administrative levels, especially for drainage infrastructure and relocation and upgrading of flood-prone settlements. Coordinated efforts between different government levels have been at the centre of the main projects and programmes: the national government secures funding for housing, the provincial government finances basic infrastructure and the municipal government contributes the land and takes planning and management responsibility. In addition, some residents are making their own contribution via an innovative system ("sistema de contribución de mejoras") where they co-finance with the municipal government improvements for the area where they live (e.g. incorporation of technology to regulate storm water runoff in public and private buildings and spaces). Finally, since 2014, the local government has begun to apply for international financing for DRR and resilience, including from the Rockefeller Foundation and the French Facility for Global Environment.

MAIN CHALLENGES:

- Knowledge transfer, including technical "know-how" and personal linkages with representatives of other departments and organizations when experts in key positions rotate. Redundancy, as a resilience criterion, should apply not only to "hard" infrastructure but also to "soft" social capital;
- Involvement of other key urban actors in a DRM process led by the municipal government (e.g. once the municipal DRM system was in place, involvement from the university faded away);
- Financial resources from higher political-administrative levels fluctuate, usually according to the partisan affiliation of the administrations in office.

USEFUL LINKS:

Santa Fe Como Vamos
http://www.santafeciudad.gov.ar/gobierno/transparencia/como_vamos.html

Oficina de Gestión de Riesgos
http://santafeciudad.gov.ar/blogs/gestionderiesgos/

Sistema de Contribución de Mejoras
http://www.santafeciudad.gov.ar/ciudad/trabajando_juntos/sistema_contribucion_mejoras.html

Risk communication: creating a culture of prevention

The municipal government understood that DRM requires the involvement and collaboration of all actors in the city, so it created the risk communication programme with the aim of embedding the new approach across the general public and specific sectors. More broadly, the move responded to a desire for transparency and to report back to citizens about local government actions and responsibilities.

The risk communication programme was initially under the Department of Communications before being transferred to the DRM office. DRM has its own section in the municipal government's website and the municipal government YouTube channel has a specific playlist for DRM-related activities, and printed communication materials (also available online) have been widely distributed. Communication materials cover the root causes of disaster risk and include recommendations in case of emergency and graphically represent evacuation routes and meeting points in maps of municipal districts. Online and printed materials are combined with awareness-raising talks and workshops at neighbourhood level.

Much importance is given to primary, secondary and higher education. For primary and secondary schools, training materials have been developed as part of the city-classroom project. The risk communication programme also coordinates a water route activity where school children visit the city's flood defence and pumping system. A DRM course has been designed and offered to students from different disciplines in one of the local public universities. The DRM office has also proposed to collect all undergraduate and master dissertations related to DRM and flood risk in a common repository for public access. Finally, specific training is given to journalists and media professionals to adequately communicate in times of emergency.

MAIN CHALLENGES:

- To sustain a culture of prevention and risk awareness among residents and organizations when there are no acute shocks or hazardous events that affect them;
- The city-classroom project is not a mandatory component of school curricula. Its delivery entirely depends on the good will and interest of teachers and directors;
- Scarcity of professors to teach the DRM elective module at university.

USEFUL LINKS:

Santa Fe Ciudad Modelo en Prevención de Desastres (Playlist in YouTube channel)
https://www.youtube.com/playlist?list=PL1gRZAv1naaylkCtHVqHZtk6ZOmH18WZn

Printed communication materials for the general public: My City magazine (available online)
http://santafeciudad.gov.ar/blogs/gestionderiesgos/gestion-de-riesgos/la-gestion/material-para-descargar-2/

Printed communication materials for the classroom: city-classroom project (available online)
http://santafeciudad.gov.ar/blogs/gestionderiesgos/gestion-de-riesgos/la-gestion/material-para-descargar-2/

Monitoring and reporting for prevention and response

After focusing initially on raising awareness and organizing for response, the city began paying more attention to data – specifically, monitoring meteorological and hydrological conditions and getting information to the right organizations and sectors to inform decision-making.

The municipal government bought its own automated meteorological and telemetric stations. A specialized team within the DRM office monitors these stations through the PEGASUS software. Real-time data is available for those with access to the system; for those without access, daily reports are uploaded to the DRM website.

When emergency protocols are activated, representatives from different areas gather in an operations centre. The specialized team from the DRM office keeps the operations centre informed on the hydro-meteorological conditions. Together with the risk communication programme, this team coordinates the elaboration and sharing of daily reports in emergencies. These reports are shared with key representatives of different departments, e-mailed to relevant media and uploaded to the DRM website and social media. Information includes: number of evacuated people and their location in municipal shelters; functioning of the pumping system; public transport operability, etc. An app for mobile devices is currently under development to directly report early warnings to residents.

For monitoring, the DRM office also uses a municipal drone with a camera. During emergencies, sometimes it also hires a drone with a video camera. Based on the information collected, some maps have been produced. At the moment, the DRM office and the Department of Water Resources are analysing the possibility of installing automated sensors for monitoring the storm drainage and pumping system.

MAIN CHALLENGES:

- Geo-referenced data across municipal government departments are scarce. There is a shared georeferenced data repository within the municipal government, but it is not regularly updated by the different departments.
- Raw data available from monitoring processes are mainly used for daily reporting and early warning. However, there is no systemized feed of technical risk assessments nor future risk scenarios (at least within the municipal government).
- Coordination with universities and research centres as platforms for the elaboration of risk assessments and climate modelling is not well-established.

USEFUL LINKS:

Meteorological data
http://santafeciudad.gov.ar/blogs/gestionderiesgos/informacion-meteorologica/

Hydrological data
http://santafeciudad.gov.ar/blogs/gestionderiesgos/informacion-hidrologica/

Reports when emergency protocols are activated
http://santafeciudad.gov.ar/blogs/gestionderiesgos/centro-de-operaciones/

Ongoing learning and transformation

Self-assessment tools have contributed to critical reflection on improving the local DRM process. The municipal government completed the UNISDR LG-SAT for the first cycle (2011-2013) and conducted a diagnosis for the development of its resilience strategy (following the format of the 100 Resilient Cities initiative). The latter can be considered both a monitoring tool of the ongoing process and a preliminary assessment to start a new DRR and resilience cycle based on past experiences and learning.

City-to-city networks are also a central component of the learning process. The city of Santa Fe is a member of various international networks which focus on DRR and resilience at the urban scale and has also encouraged the creation and functioning of relevant networks in the region. Some of these networks include:

- **UNISDR Making Cities Resilient campaign.** Santa Fe is a role model city and its current mayor has been nominated champion for the campaign.
- **The Rockefeller Foundation 100 Resilient Cities.** In June 2017, Santa Fe launched its resilience strategy, which is currently under implementation.
- **Mercociudades**. Santa Fe presided over the MERCOSUR network of cities for 2016-2017, where it has been promoting urban resilience as an overarching framework.
- **Argentina Network of Municipalities against Climate Change (RAMCC)**. Santa Fe is a member of the network of Argentinean cities for climate change adaptation and mitigation.
- **Regional network for the Paraná River basin.** An initiative proposed by the DRM office of the city of Santa Fe to bring together 13 cities and four provinces in the littoral region exposed to hydro-meteorological risks. It failed due to lack of engagement of targeted cities.

Learning also entails adjustment. Specifically, in the case of Santa Fe, this has translated into adjusting conceptual frameworks and scale. Regarding frameworks, the city is expanding its focus from hydro-meteorological events (the trigger of the entire DRM process) to other shocks and stresses (that is, a resilience lens). Additionally, there is increasing recognition of the relevance of the metropolitan scale. Since 2016, there is a commission working on developing a metropolitan structure – flood risk reduction being one of the key working areas. The development of the resilience strategy is also bringing this metropolitan approach to the fore, impelled by concepts such as 'city-region' and 'urban infrastructure ecosystem'.

MAIN CHALLENGES:

- Transition of conceptual frameworks entails organizational re-structuring and new frames of reference for those who have to design, plan and implement programmes and projects targeted at reducing and/or managing disaster risk and creating urban resilience. During this transition, different frameworks might overlap, so leadership for conceptual clarity and guiding actions is crucial.
- A metropolitan approach entails a strong political commitment from leaders of different jurisdictions who advocate different political views and represent various interests.

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USEFUL LINKS:

UNISDR Making Cities Resilient campaign – Santa Fe
http://www.unisdr.org/campaign/resilientcities/home/cityprofile/City%20Profile%20Of%20Santa%20Fe/?id=2093

Local government self-assessment report (LG-SAT) 2011-2013
http://www.preventionweb.net/english/professional/policies/v.php?id=31774

100 Resilient Cities – Santa Fe
http://www.100resilientcities.org/cities/entry/santa-fe-AR#/-_Yz5jJmg%2FMSd1PWI%3D/
http://santafeciudad.gov.ar/blogs/ciudad-resiliente/

Resilience Diagnosis
http://santafeciudad.gov.ar/blogs/ciudad-resiliente/wp-content/uploads/2016/11/100-Resilient-Cities-Evaluacion-Preliminar-de-Resiliencia_SFC_VF2_alta-1.pdf

Resilience Strategy
http://santafeciudad.gov.ar/blogs/ciudad-resiliente/wp-content/uploads/2017/07/Eng_SFC_ResilienceStrategy_VF.pdf

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Aguirre Madariaga, E., 2015. Enfoque de la gestión local de riesgos. La experiencia de la Ciudad de Santa Fe. In Secretaría de Ambiente y Desarrollo Sustentable, ed. Inundaciones urbanas y cambio climático: recomendaciones para la gestión. Ciudad Autónoma de Buenos Aires: Secretaría de Ambiente y Desarrollo Sustentable de la Nación, pp. 118–122. Available at: https://reliefweb.int/report/argentina/inundaciones-urbanas-y-cambio-clim-tico-recomendaciones-para-la-gesti-n

Gobierno de la Ciudad de Santa Fe, 2014. Learning from Disasters. Local risk management in Santa Fe, 10 years after the 2003 flood, Santa Fe: Gobierno de la Ciudad de Santa Fe. Available at: http://santafeciudad.gov.ar/blogs/gdr/publicacion-aprender-de-los-desastres/

CASE STUDY 9

MANIZALES (COLOMBIA)

Financing integrated risk management as urban development strategy

Manizales, with about 370.000 inhabitants, is the capital of the Department of Caldas in the Colombian Andes. It is nationally and internationally recognized for its holistic disaster risk management, which has been a necessity and strategy for its urban development because of its location in extraordinarily hazardous terrain. The strategic and long-term approach has involved well-elaborated, strong institutional relationships between municipal and departmental government organizations, academia, service providers and civil society actors. It is manifested in a variety of reactive, prospective and corrective risk-management actions. These include refurbishing public buildings to make them seismically resistant, slope-stabilization works, land-use planning, comprehensive and profound data and information infrastructure to accurately monitor and evaluate environmental conditions, and the emblematic programme Guardians of the Slope, with its employment and capacity-building focus to reduce vulnerabilities and mitigate hazards.

Manizales is an example of how an integrated approach can be sustained over the long term as an overarching framework and urban laboratory that manages to overcome constraints that are common to many cities, such as lack of political will and scarce financial resources. This is exemplified by the programme Risk Management in Manizales which sought to improve risk management by strengthening policies, strategies and instruments within the framework of development planning and sustainable development. It aimed to better identify and reduce risk and manage disasters. The programme and its projects and interventions were co-developed by the local government, the Departmental Environmental Agency CORPOCALDAS and the National University of Colombia in Manizales. It was implemented from 2011 to 2015 by these institutions, together with experts brought in to work on different aspects of DRM, such as data and information systems, monitoring, technological development, culture and research.

Financially it was based on two building blocks. One is an environmental surcharge, which municipalities have to set, by law, at between 1.5 and 2.5 per thousand (0.15-0.25%) of the appraised value of the assets that serve as the basis for property tax. The Municipal Council of Manizales raised its surcharge from 1.5 to 2.0 per thousand (0.15 to 0.2%) for the fiscal period 2009-2019. This has generated approximately 2,000 million Colombian pesos a year, which have been transferred to CORPOCALDAS for management and implementation. In order to finance monitoring, capacity building and research projects, such as seismic micro-zoning, development of rapid damage evaluation tools, and development of local climate-change projections, the municipality applied for a credit of 20,000 million pesos from Findeter (the Colombian Development Bank) and earmarked the anticipated increase in revenue from the surcharge to pay back this credit.

The second financial contribution came from the state-led campaign Colombia Humanitaria. Due to heavy precipitation during the winter of 2010, a state of disaster and an economic, social and ecological emergency were declared through national decrees. Subsequently, the National Calamity Fund for emergency management and recovery in the medium and long term was reformed and Colombia Humanitaria was launched. Due to the effects of La Niña, Manizales decided to shift more than 11,000 million of its initial project budget of 20,000 million pesos to implement necessary structural works. Additionally, these 20,000 million pesos were used as a matching fund in a proposal put to Colombia Humanitaria, which granted 64,600 million pesos for long-term recovery from the negative impacts of the winter.

In total 84,600 million pesos (equivalent to US$43 million at 2012 rates) were invested in the city, with a majority of investments going to structural measures, like slope stabilization works. But money was also spent on non-structural actions, such as education and communication, with 8,500 million pesos allocated to the National University of Colombia in Manizales for research.

Important factors to access these large financial resources include:

- A shared understanding by key collaborators that a large-scale DRM project is needed, as well as what the project proposal needs to address;
- A legal framework, well-developed and coherent argumentation and a good working relationship between the collaborators and the local council to approve extending credit repayment times beyond the life of a single government;
- A long history of hazard events along with a track record of successful mitigation actions to add to the credentials of the professional experts and local institutions. This provides evidence of the capacity for large-scale project management and implementation;
- A window of opportunity like Colombia Humanitaria which, due to Manizales' established networks, its strategic framework and elaborated plans, was quickly utilized to submit a refined and winning proposal to the national government.

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USEFUL LINKS:

Manizales Como Vamos
http://manizalescomovamos.org/?page_id=1221

Gestión del Riesgo - Manizales
http://gestiondelriesgomanizales.com/

Corporación Autónoma Regional de Caldas (CORPOCALDAS)
http://www.corpocaldas.gov.co/dynamic_page.aspx?p=836

RELEVANT LITERATURE:

Bernal, G. A., Salgado-Gálvez, M., Zuloaga, D., Tristancho, J., González, D., Cardona, O.D., 2017. Integration of Probabilistic and Multi-Hazard Risk Assessment Within Urban Development Planning and Emergency Preparedness and Response: Application to Manizales, Colombia. International Journal of Disaster Risk Science 8, 270-283.

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07

CONCLUSION

What often work best in DRM are local-level actions that enable people and governments to deal with their everyday needs and have better livelihoods, while also enabling them to take occasional and severe events into account. In other words, it has to do with “good development” practice and a people-centred risk reduction approach that helps build accumulated resilience. As this guide has noted, disaster risks increase due to lack of urban planning and land-use management, environmental degradation, poverty, inequality, vulnerable livelihoods and fragile governance systems. Addressing these underlying risk factors represents a major challenge for achieving the Sustainable Development Goals.

As disaster management evolves into disaster risk management, there is greater concern and urgency for understanding the “how”, “who” and “with what” of DRR and resilience. And local actors are in the best position to activate change. Committed local governments, working together with a wide range of actors and sectors, can engage on innovative local agendas that address underlying risk drivers and build up resilience.

The purpose of developing a local DRR and resilience strategy is to develop a common vision for the city – including guiding principles and priorities – to shape local development processes so that local areas become more resilient and can pursue transformational change. A local DRR and resilience strategy needs to be linked to the actual priorities of each locality and its entire population, and it should incorporate certain flexibility and periodic evaluation mechanisms to adjust course, evolve and adapt to changing circumstances. More importantly, it should take advantage of and build upon areas of strength, such as long-term local development and planning processes, “good” governance mechanisms, innovation provided by civil society, academia and/or the private sector, collaboration processes at metropolitan or regional scale, and national strategies and legal frameworks that support local action, among others.

As the case studies in this guide illustrate, there is no blueprint or pathway to follow. But there are many good lessons that guide what a strategy should look like, who should be involved, what mechanisms might be used and how it is possible to advance in implementation. The other WIA guides, with their tools and examples, contribute to deepen our understanding of different cross-cutting themes, the various actors involved and their roles, and priorities for action. They are all relevant to develop a local DRR and resilience strategy, and therefore complement this guide.

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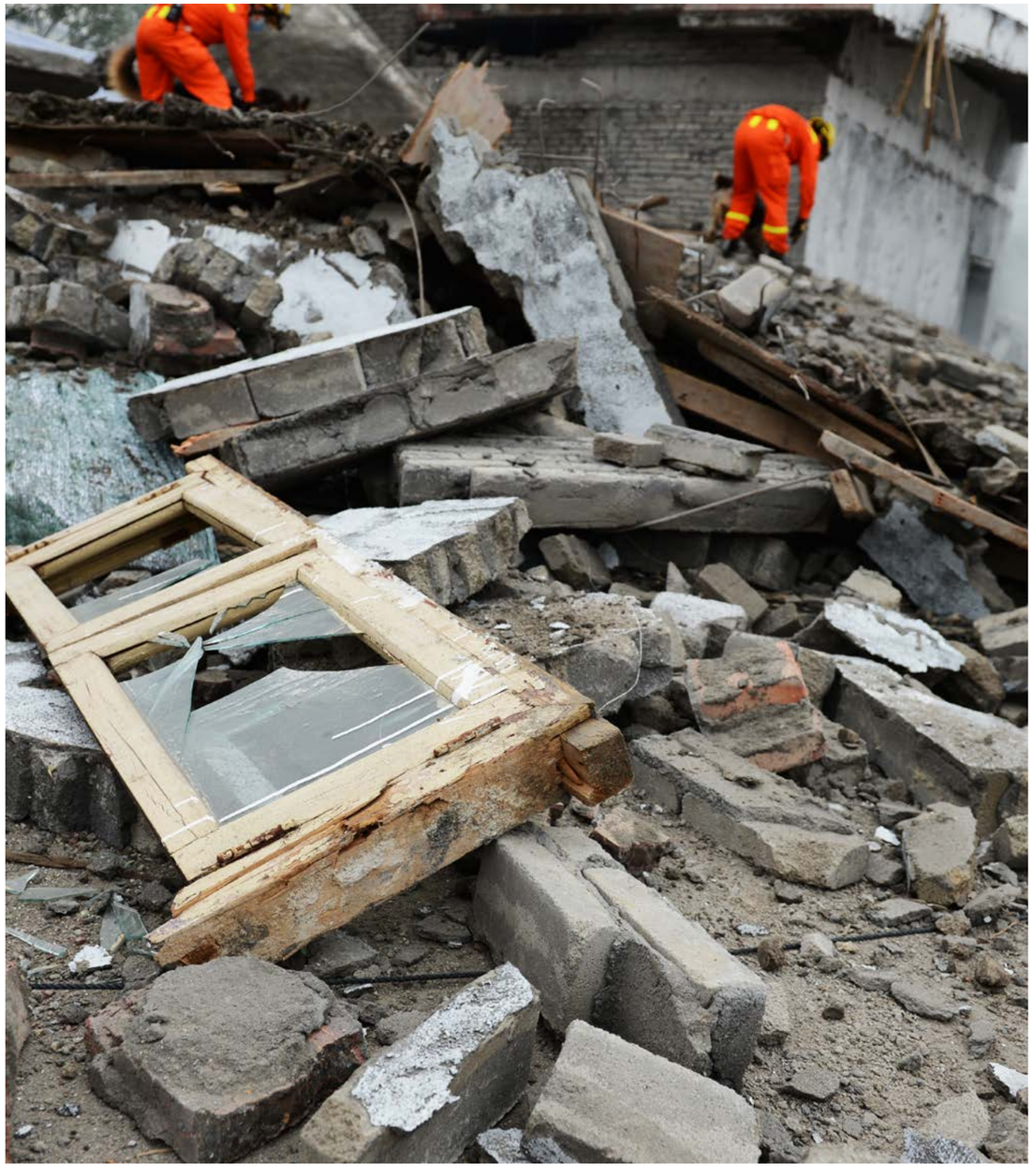

APPENDIX I

SENDAI PRIORITIES FOR ACTION, THE TEN ESSENTIALS AND WHAT THEY MEAN AT THE LOCAL LEVEL

SENDAI PRIORITIES FOR ACTION	TEN ESSENTIALS	WHAT DOES IT MEAN AT THE LOCAL LEVEL?
Priority for action 1. Understanding disaster risk	Identify, understand and use current and future risk scenarios (Essential 2)	• 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 impact 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 in all decision-making processes
Priority for action 1. Understanding disaster risk	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

SENDAI PRIORITIES FOR ACTION	TEN ESSENTIALS	WHAT DOES IT MEAN AT THE LOCAL LEVEL?
Priority for action 2. Strengthening governance to manage disaster risk	Organize for disaster resilience (Essential 1)	• Ensure disaster risk governance is a key component of the city vision and/or strategic development plan of the city, recognizing the relevance of participatory and inclusive mechanisms for DRR and resilience • Discuss and agree on the levels of disaster risk that are acceptable to your city. Revise them over time • 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) • 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 • 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 • Build up alliances and collaboration processes horizontally (across sectors and actors within the city and with neighbouring cities) and vertically (across different political-administrative levels) • Have a clear operational framework to make collaboration possible • Approve codes and bylaws and/or revise existing ones to integrate resilience attributes • Have in place reporting mechanisms for all stakeholders that collect/process/consolidate key information
	Strengthen institutional capacity for resilience (Essential 6)	• Identify local capacities among different actors and agree on division of responsibilities. Secure effective communication so everyone knows "who does what" • Strengthen local capacities to better understand the relevance of integrated responses, linking DRM to climate change and sustainable development • Develop capacities and local know-how via training activities and knowledge exchange (within your city, with other cities, with the private sector, etc.) • Develop a portfolio of project proposals that address different issues in your city and which are ready for submitting to different funding opportunities • Share information and knowledge; work towards guaranteeing access and interoperability
	Understand and strengthen societal capacity for resilience (Essential 7)	• Work with local actors to take into account their views/opinions on different development alternatives • Secure mechanisms for participation in planning, implementation and monitoring and evaluation processes • Support the work of community-based organizations and local NGOs (e.g. from work on housing and water and sanitation to specific emergency response) • Target different groups and/or sectors, such as businesses and industries, schools, professional associations, etc.
Priority for action 3. Investing in disaster risk reduction for resilience	Strengthen financial capacity for resilience (Essential 3)	• Work on financial planning and definition of priorities to ensure that actions to build resilience receive support • Earmark an annual budget for DRR and resilience – it can be distributed between different offices/sectors • Develop an inventory of financing mechanisms and potential sources • Ensure adequate financial support to vulnerable groups (e.g. via social protection, microfinance, etc.) • Ensure that funds invested in response and recovery also include 'building back better' and pursue sustainable development
Priority for action 2. Strengthening governance to manage disaster risk	Pursue resilient urban development and design (Essential 4)	• 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
	Safeguard natural buffers to enhance ecosystems' protective functions (Essential 5)	• Ensure appropriate legislation to safeguard ecosystems and their protective functions, including funding schemes for multiple uses and collaborative conservation • Develop programmes to ensure all citizens understand the protective role of ecosystems (among other services) • Consider green and blue infrastructure or nature-based solutions to enhance local resilience • Work in collaboration with neighbouring cities and broader administrative levels (e.g. region or basin) to safeguard ecosystems and their protective functions
	Increase infrastructure resilience (Essential 8)	• Assess if current infrastructure is adequately designed, built and maintained to respond to current and future risk scenarios • Prioritize areas for investment in existing and new infrastructure • Have guidelines for risk-sensitive development of future infrastructure • 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 • Ensure that service providers understand disaster risk and the role of infrastructure in reducing current and future risks
Priority for action 4. Enhancing disaster preparedness for effective response, and to 'build back better' in recovery, rehabilitation and reconstruction	Ensure effective disaster response (Essential 9)	• Have emergency plans/protocols in place with clearly defined roles and responsibilities for all local actors. Establish coordination mechanisms and assign resources where needed • Validate emergency plans/protocols with all local actors • Communicate emergency plans/protocols and test them periodically (e.g. design regular drills according to type of emergency and sector) • Have early warning systems (EWS) broadcasted to all citizens for effective and quick response • Ensure availability of equipment and supplies • Assess and evaluate response capacity to continuously improve it
	Expedite recovery and 'build back better' (Essential 10)	• Have emergency plans/protocols in place with clearly defined roles and responsibilities for all local actors. Establish coordination mechanisms and assign resources where needed • Validate emergency plans/protocols with all local actors • Communicate emergency plans/protocols and test them periodically (e.g. design regular drills according to type of emergency and sector) • Have early warning systems (EWS) broadcasted to all citizens for effective and quick response • Ensure availability of equipment and supplies • Assess and evaluate response capacity to continuously improve it

Source: Authors' elaboration based on revised Ten Essentials

APPENDIX II
GUIDING QUESTIONS FOR LOCAL LEADERS, PLANNERS AND MANAGERS

As a local leader, planner or manager ask yourself:

1. Should the DRR and resilience strategy-making be an exclusive and isolated process or rather be integrated in the local development plan-making process of your local area/city?
2. Does the local DRR and resilience strategy need a separate space for discussion or should it rather be part of a broader discussion about the vision of your local area/city?
3. How do we organize for DRR and resilience?
4. Who's who in the DRR process?
5. Who does what in the DRR process?
6. How do we incorporate DRR into the everyday practices of local actors?
7. How do we create a shared vision and understanding of DRR to gain support from most – if not all – local actors as part of the process?
8. How do we coordinate different areas/sectors within and outside government for coherent and integrated DRR practices?
9. How do we link the local institutional and organizational dimension of DRR with higher levels (provincial, regional, national)?
10. Who does what and with what funding?

Source: Authors' elaboration

APPENDIX III
OTHER RELEVANT CONCEPTS IN THE GUIDE

Accumulated resilience: the "built-in" resilience a city has accumulated through the processes of city-building, infrastructure investment and socioeconomic development. Drawing on resilience literature and city evidence, four components make up a resilient city:

Resilience = resistance + coping capacity + recovery + adaptive capacity
(Johnson & Blackburn 2014)

A city's accumulated resilience can be assessed for the extent to which it has reduced hazards, risk and exposure, with particular attention to how this serves or protects vulnerable groups (those who are most sensitive to the risks and those lacking the capacity to cope and adapt). One of the tests of the effectiveness of all the above is whether it provides resilience for those with limited incomes, chronic illnesses and disabilities (Satterthwaite 2013).

Development work: Long-term support that seeks to alleviate poverty, improve the living standards of the population, strengthen the economy and build capacities for good governance (Wamsler 2014).

Extensive disaster risk: The risk of low-severity, high-frequency hazardous events and disasters, mainly but not exclusively associated with highly localized hazards (UNISDR 2016b).

Intensive disaster risk: The risk of high-severity, mid to low-frequency disasters, mainly associated with major hazards (UNISDR 2016b)

UNDRR
UN Office for Disaster Risk Reduction

WORDS INTO ACTION

LOCAL DISASTER RISK REDUCTION AND RESILIENCE STRATEGIES

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