

Words into Action Guidelines

Implementation guide for local disaster risk reduction and resilience strategies

A companion for implementing
the Sendai Framework target E

2018 - Public consultation version

**This guideline is an effort from the international
DRR Community and brokered by UNISDR**

In support of the Sendai Framework
for Disaster Risk Reduction 2015 - 2030



UNISDR

United Nations Office for Disaster Risk Reduction

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Cover image: Resilience Workshop, December 14th 2016, Belgrano Station Convention Centre, Santa Fe
(Argentina). Credit: Secretaría de Comunicación y Desarrollo Estratégico, Gobierno de la Ciudad de Santa Fe.

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 sub-national 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 from IIED – América Latina and María Evangelina Filippi (PhD candidate, UCL) under the coordination of Dr Cassidy Johnson from UCL, and the support of Ebru Gencer, Braulio Moreira and David Satterthwaite. This is one of the three guides commissioned to the UNISDR Urban Planning Advisory Group (UPAG) – the other two being the Land use and Urban Planning guide and the Local Authorities guide.

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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
LA	Local Authority
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	Nongovernmental 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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Chapter 1: Introduction

1.1 About the guidebook

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. Ideally, for each city, there should be a long-term plan to guide urbanization and urban growth, but often this has not been the case. In many urban centers 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.

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 centers usually generates new patterns of hazard, exposure and vulnerability. Current development pathways tend to increase disaster impacts, and many disaster impacts are likely to increase due to anthropogenic climate change.

Today, there is a consensus that disaster risk reduction (DRR) through disaster risk management (DRM) 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. 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 for Disaster Risk Reduction 2015-2030 (Sendai Framework) highlights this as one of the areas where less progress has been made and greater efforts are required.

Sendai Framework charts the global course on DRR matters over the next 15 years. 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.

Drawing from consultations and discussions around the Sendai Framework, and with the aim of providing practical guidance to support its implementation, the United Nations Office for Disaster Risk Reduction (UNISDR) is introducing 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 sub-national levels) on 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 guidebook is intended for local governments, as it usually falls within their mandate to ensure local development and to manage disaster risk so that it does not undermine development. It is also among the responsibilities of local governments to provide and implement the regulatory frameworks within which other stakeholders contribute, collaborate and engage in the local development process, including developing DRR and resilience strategies.

Box 1: The difference between a strategy and a plan

A local disaster risk reduction and resilience strategy is a planning tool developed with 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 disaster risk reduction plan provides the operational orientation for implementing the strategy. It defines specific goals to reduce disaster risk together with priority actions and activities to achieve these goals. It goes into needed detail as it assigns roles and responsibilities, mobilizes resources and allocates budget. It also sets timelines, indicators, and mechanisms for monitoring progress.

1.2 Organization of the guidebook

This guide is divided into seven chapters. Following the introduction, chapter 2 highlights the role of subnational levels in developing local disaster risk reduction and resilience strategies and the importance of localizing DRR. Chapter 3 delineates the main characteristics of a local disaster risk reduction and resilience strategy, while chapter 4 introduces the enabling factors that generate the conditions for its development throughout an inclusive and participatory process. Chapter 5 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; and 3) having financial resources to be able to plan and act. Chapter 6 includes a selection of case studies exemplifying some of the main themes covered in the guide. Finally, chapter 7 draws some conclusions.

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 livelihoods opportunities – reduces exposure and vulnerability and therefore risk. Reducing disaster risk is about addressing basic development that helps build “accumulated resilience”, as well as 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-centered 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 to focus on what must be done, but more importantly, on how and by whom, and with what support. And last but not least, 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).

Sendai Framework is the successor of the Hyogo Framework for Action 2005-2015 (HFA). Whereas the new Framework acknowledges that good progress has been made in raising awareness, generating political commitment and focusing and catalyzing 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 turned more attention to the role of local governments and the relevance of the local level than the other international agreements.

Globally, however, 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 DRM 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 their most progressive form, DRR and DRM 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.

DRM involves considering and managing a wide range of risks, from the frequent and small-scale risks associated with everyday life to the infrequent and larger scale risks related to extreme events (see Figure 1). Then, it can be an entry point to simultaneously advancing DRR, climate change adaptation and sustainable development.

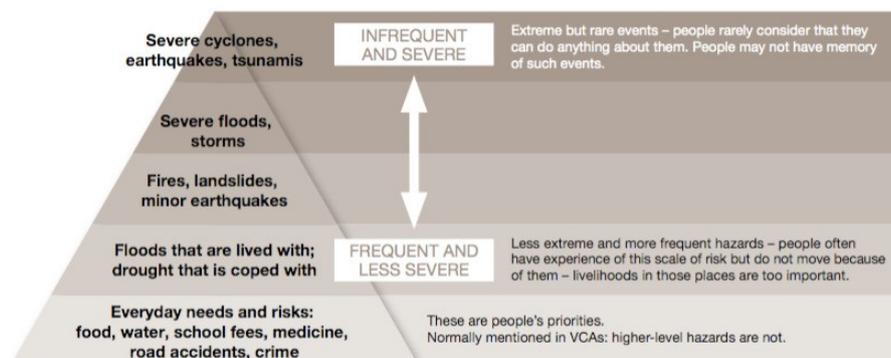


Figure 1: Risk hierarchy
Source: Cannon in IFRC 2014:76

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.

The Sendai Framework highlights the role of local authorities (LAs) and the local level in achieving DRR. Indeed, one of the targets of the Framework is to substantially increase the number of countries not only with national, but also local DRR strategies by 2020. The efforts of UNISDR and its partners to emphasize the importance of cities and local governments 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 is one of the key tools, and allows local governments to track progress against a checklist of activities and to evaluate their commitment towards building resilience. It aims 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 and DRM that make sense for local development and address issues that are important for local governments and city 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 LAs 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.

HAZARD x EXPOSURE x VULNERABILITY

= DISASTER RISK

RESILIENCE or COPING CAPACITIES

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. Risk factors can be addressed by strengthening individual, collective and institutional capacities to cope with and/or reduce risks.

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. Developing resilience and/or coping capacities contributes to reducing disaster risk.

However, the idea of “springing back” should pay special attention to not reproducing vulnerability conditions that triggered the disaster in the first place, and thereby pursue transformational change. Resilience can be built when citizens and the institutions that serve them take action to build a culture of safety in a broad sense.

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

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 extremes, and adding 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 disaster risks that are already present and which need to be managed and reduced immediately. Examples are the retrofitting of 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 also covers retrofitting of buildings and 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 contributes to

climate change adaptation and mitigation and to a sustainable future.

	Prospective	Corrective	Compensatory
Disaster risk management	<i>Risk avoidance</i>	<i>Risk mitigation/reduction</i>	<i>Strengthening resilience to disaster (both financial and social resilience)</i>
Climate change	<i>Climate change mitigation</i>	<i>Climate change adaptation</i>	<i>Strengthening resilience to extreme events associated with climate change</i>
Sustainable development	<i>Contributing to future sustainable development</i>	<i>Increase the sustainability of existing development conditions</i>	<i>Strengthening resilience to everyday risks and shocks</i>

Figure 2: Links between DRM areas of practice, climate change and sustainable development

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>

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

<http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=2>

Terminology on DRR

<http://www.preventionweb.net/drr-framework/open-ended-working-group/>

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

Chapter 2: 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 that local actors – including 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:

- 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 important to emphasize that local DRR and DRM are not limited to the municipal political- administrative boundaries. 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. However, there are a few reasons that explain why the municipal scale (and the city/ municipal/local government) has such a strong relevance when referring to local DRR and DRM, namely:

- DRM 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.

Further reading (see References section):

Anton et al. 2014; Lavell 2003a; Lavell 2003b; Maskrey 2011; UCLG 2014

2.2 Why cities and urban areas?

There is consensus that global disaster risk has not been reduced significantly. Though mortality has been reduced in many countries, economic losses from disasters continue to rise across the world. Economic losses due to disasters are increasing faster in OECD countries, but the impact of economic losses relative to GDPs 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 hazard prone locations, with increasing populations and assets exposed to hazards, and, sometimes, high degrees of social inequality, informality, poverty, and insecurity that further aggravate the underlying risk drivers.

In 2014, 54% of the world’s population was living in urban areas, and this proportion is expected to rise to 66% by 2050 (UNDESA 2014). More importantly, approximately 60% of the area to be urbanized towards 2030 has yet to be built. While the latter will happen mostly in countries and urban centers with low capacities to ensure risk reducing infrastructure and services, it represents an opportunity to reduce disaster risk globally. Cities and urban areas concentrate population, economic activities and the built environment in ways that the economies of scale or agglomeration 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.

Different city-to-city platforms are in place to 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 3,455 signatory cities as of January 2017. Other initiatives include 100 Resilient Cities, pioneered by the Rockefeller Foundation; C40; and the work of ICLEI Local Governments for Sustainability and United Cities and Local Governments.

Explore more:

UNISDR Making Cities Resilient campaign

<http://www.unisdr.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

Ideas about decentralization and devolution of responsibilities have received greater attention in international and national agendas. In many countries, these have been backed up with new legislation that gives LAs greater autonomy regarding local development, but also greater obligations. Many responsibilities – including the responsibility for DRR and DRM – 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 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 and DRM. Many cities involved in the Making Cities Resilient campaign have managed to assume DRM 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 needs to be in place, but also the needed support to comply.

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

Chapter 3: 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, and to guide and make coherent local plans and actions. 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 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. The city strategy is built collectively. City leaders need to develop an enabling environment so that all actors can contribute to the strategy making process and support its implementation. City leaders should also promote the creation of a team (can be small) to coordinate activities, integrate visions and priorities, and follow up on the process. It should be a team with time to coordinate planning and participation, not tied to constant urgent/every day demands. 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. The latter is a necessary condition if DRR is to be truly incorporated in the every-day planning and development of the local area or city. It is key that the strategy builds on existing processes, projects and activities and develops a unified agenda that supports DRR and Resilience.

A strategy should have:

- A shared vision and understanding of DRR that is integrated into the city's development strategy.
- A designated chore team leading/coordinating the process and ensuring its implementation, with capacity to work with different actors.
- A budget (some in the form of dedicated budget for chore team activities, others allocated from different offices and departments but clearly

earmarked as contributing to the strategy)

- A chronogram of activities with a timeframe to fulfill the preparation of the strategy and its implementation through an action plan. Activities involve various types of work meetings with actors, preparation of a baseline document, an outline of roles and responsibilities of different actors involved in the strategy making and implementation process, presentation of the strategy and follow up, elaboration of the action plan.

A local disaster risk reduction and resilience strategy has sustainable development as a guiding principle. In this regard, 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.

It has to weave DRR into development. 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 livelihoods possibilities, and equity. Mainstreaming DRR into the operations and development activities of local governments and other local/urban actors, can contribute to reducing disaster impacts much more effectively and sustainably than isolated, sectoral actions. DRM is more meaningful and attractive when it can simultaneously respond to DRR and improve social, economic and environmental wellbeing.

Once local actors agree on a shared vision of the city, its risks, and how it relates to sustainable development and resilience building, and defines a coordinating team, it is necessary to start developing a local action plan. The implementation/operationalization of the strategy takes place through the elaboration and implementation of action plans.

The UNISDR, through the Making Cities Resilient Campaign "My city is getting ready", offers a set of tools and training options to help develop local action plans: These are the Scorecard and the training modules to develop local action plans during workshops facilitated by the Global Education and Training Institute (UNISDR – GETI). The Scorecard is structured around UNISDR's Ten Essentials for Making Cities Resilient, and is provided in two versions: preliminary assessment and detailed assessment. It allows local governments to monitor and review progress and challenges in the implementation of the Sendai Framework for Disaster Risk Reduction: 2015-2030, to assess their disaster resilience, and to identify gaps in management capacities. It also supports Local Governments in developing the city resilience action plan, specially, by deploying the Scorecard detailed version.

Figure 3 presents the action plan cycle preparation process.

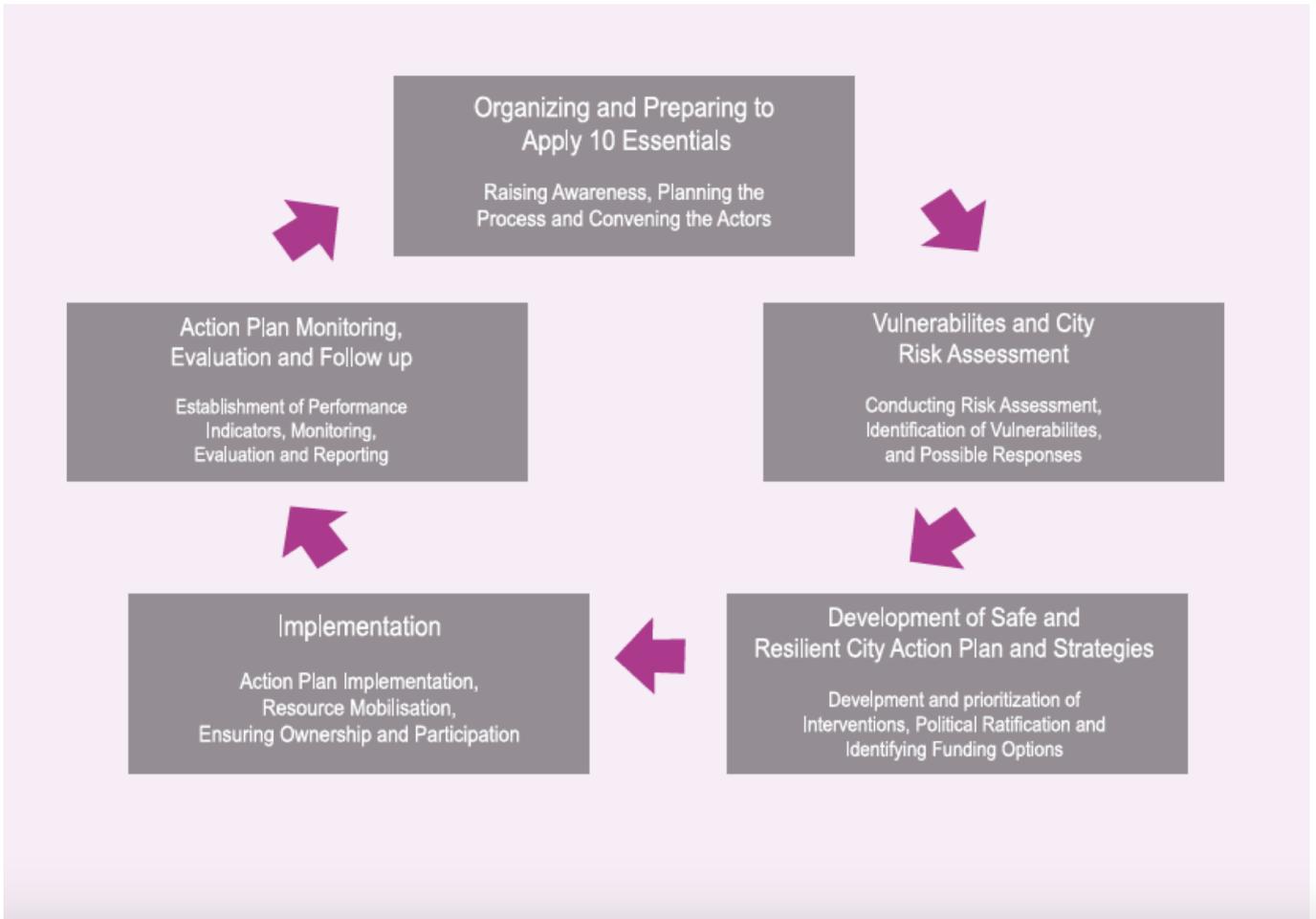
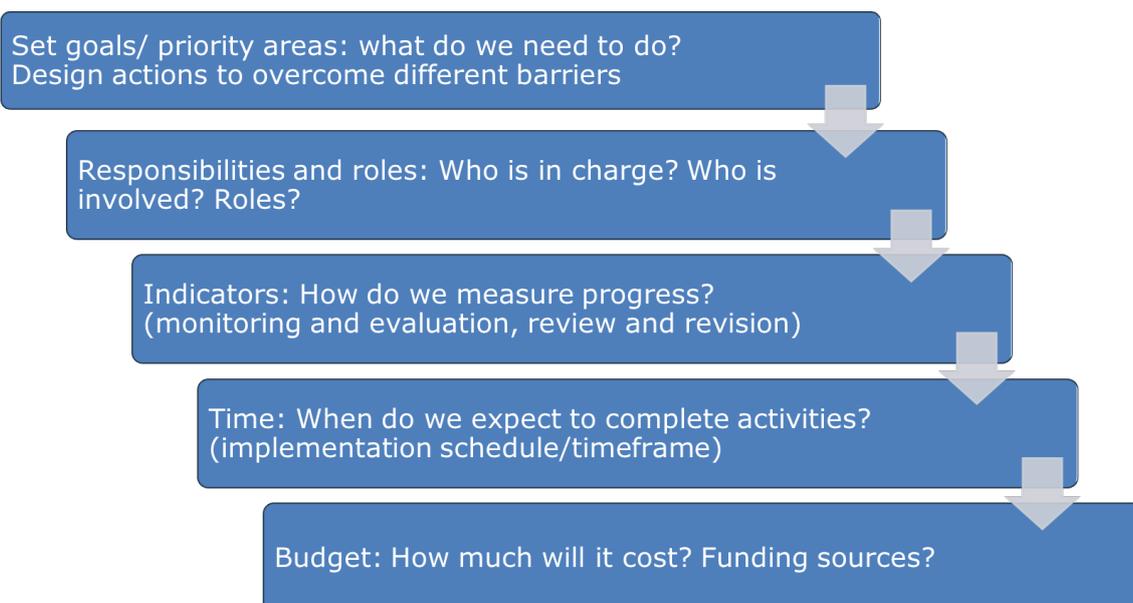


Figure 3: Action Plan cycle preparation process

Source: How to make cities more resilient, A Handbook for Local Government leaders (UNISDR 2017)

An Action Plan addresses the following questions:



Once the plan is developed, it should be presented to a governing authority for adoption (such as the Mayor and the DRM committee or urban council), and receives formal authorization to implement the plan. 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 a separate space for discussion 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 DRM. 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

Chapter 4: Enabling factors for developing 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 the 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 implementation.

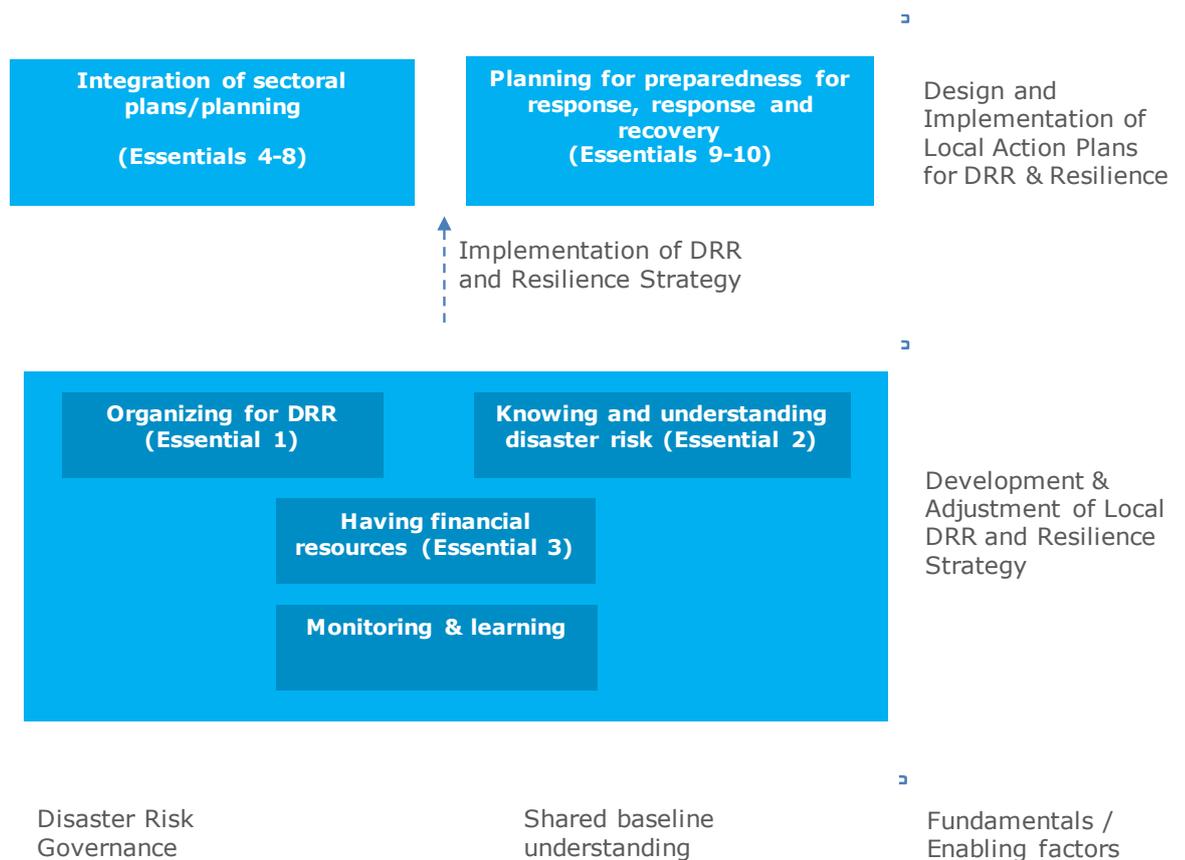


Figure 5: Enabling factors and implementation of local DRR and resilience
Source: Authors' elaboration

4.1 Disaster risk governance

There is a shared understanding that governments alone cannot deal with DRR and DRM – 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 cities. But 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. Governance also entails improving accountability, transparency and meaningful participation throughout procedures and practices. Negotiating, building consensus and reaching agreements comprise both formal and explicit mechanisms (legislation, policies, standards and administrative procedures) as well as informal and implicit agreements that mediate social, economic and political relations.

Disaster risk governance affects the distribution of exposure and vulnerability, and in turn of disaster risk, among different groups of people. Hence, reducing disaster risk and enhancing resilience results from ‘good’ governance. 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 Thomalia 2011; Djalante 2012; IFRC 2015; Johnson 2011; Manuel- Navarrete et al. 2011; Satterthwaite 2011; UNISDR 2011; UNISDR 2015a; Wilkinson et al 2014

4.1.1 Local governments leading the process

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

Much DRR and DRM falls within local or city government responsibilities, since they are at the front line of DRR and DRM. It is the local, municipal or metropolitan government, working with other relevant actors, that usually leads the DRM process. Three reasons show how this leading role is justified:

- 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

As mentioned above, governments alone cannot address DRR. Every DRR success story involves planning and implementation that gives importance to community or civil society involvement. In some cases, it is local governments leading the process of disaster risk reduction and resilience building. But in many other cases, communities themselves – alone or with the support of NGOs, academia and/or the private sector – take the lead in disaster risk reduction.

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 those 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 they 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.

But 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 in one or more of the actors involved in the process. Universities and NGOs can watchdog 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.

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. Hence, participatory mechanisms should be in place to support local governments and local actors working together. Some countries have legal frameworks that mandate participation in DRM – 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. Here, community members gather together to pursue a common goal, but 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 wellbeing. And there are good examples of this. More importantly, they 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 itself or as part of wider local development processes, such as participatory budgeting. All in all, this strengthens disaster risk governance, as established by the Sendai Framework Priority for Action 2.

See Section 6 - Case Study 2

In Kulu district, Himachal Pradesh (India), engagement of the local community helped develop mechanism to not only secure better response to fire hazards, but also improve accessibility and water access for everyday needs

Box 3: 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 neighborhood or the city as a whole and oversee project implementation. Participatory budgeting is contributing to reduce every-day stresses such as basic service provision and management, and supports governance.

Source: Cabannes (2014)

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>

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. It is about having everyone on the same page and start building a coherent DRR process integrated in the local development process. No city starts from scratch, there is a wealth of knowledge sources (scientific, technical, lay including indigenous) that cities need to tap into. This will allow for a clearer understanding of the types of risks, their possible combinations and concatenated impacts, 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 – specially, when various types of knowledge are recognized and included from the beginning of the process.

But generating consensus among local actors is not an easy and one-off issue; rather, it is a process of on-going negotiation, consensus building and coordination (and sometimes conflict resolution) among different actors with different visions and ideas of 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 beyond this for 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 allow initiating the process of sharing information and building a baseline understanding on risks and resilience, and how it connects to overall development.

The initial 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. Worth noting is 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 into 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. In fact, sometimes, too much information may be overwhelming. 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 environments to be affected by different hazards or combination of hazards.

See Section 6 - Case Study 3

Leaders from Greater Manchester (UK) highlight three key requirements for developing a DRR and resilience strategy

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.

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, and mainly in relation to future risks and uncertainty, is the consideration of different scenarios – including future climate scenarios.

See Section 6 - Case Study 4

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 county

Explore more:

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

Useful tools:

Disaster Resilience Scorecard for Cities
<http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4>

QUICKSCAN is a participatory modeling tool that combines different stakeholder knowledge with spatial and statistical data
<http://www.quickscan.pro>

Quick Risk Estimation (QRE)

A tool for understanding and identifying current and future risk/stresses/shocks and exposure threats to both human and physical assets. It is a multi-stakeholder engagement process to promote a common understanding of risk and produce a dashboard style risk assessment.

<http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=3>

Further reading (see References section):

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

Chapter 5: Implementing local disaster risk reduction and resilience strategies

The implementation of 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 specific WIA guides expanding on each of the remaining essentials.

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 defense 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 these 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)¹ 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 Studies 3,5 and 6

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 in paper: laws, regulations and codes

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 after elections 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 sub-national 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. In this context, national government structures support the development of local governments'

¹ German Arce, Gerente Fondo de Adaptación, Ministerio de Hacienda, Colombia, in Simposio interdisciplinario sobre adaptación y gestión local del riesgo de desastre: El estado del arte y la práctica de la gestión y la experiencia de Manizales, May 2015.

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 4: 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 five percent (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 the 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, programs, 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 de 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. Thus, the system proposes a 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>

http://www.colombiahumanitaria.gov.co/Prensa/2011/Paginas/ley_1523.aspx

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.

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 sub- national 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 on their own.

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 in 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 – that is, 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 between each other, 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.

Since uncertainty cannot be entirely eliminated, local governments can incorporate some of the attributes of resilient systems: redundancy (spare capacity and multiple ways to fulfill a particular need), robustness (accommodate certain failures and ensure that failure is predictable), flexibility (change, evolve and adapt in response to changing circumstances) and resourcefulness (rapidly find different ways to achieve goals or meet needs).

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-policy-makers>

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):

MacClune & Optiz-Stapleton, 2012; World Bank, 2011

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. Moreover, 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.

Self-assessments and participatory appraisals are valuable for reflecting on

See Section 6 - Case Study 5

The Makati Disaster Risk Reduction Management Office in partnership with the Philippine Institute of Volcanology and Seismology conduct training on Rapid Earthquake Damage Assessment Systems for city staff and volunteer surveyors

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. Moreover, there are useful and readily available tools and methodologies to aid in these processes.

See Section 6 - Case Study 3

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. Experience shows this is good practice for many cities around the globe. Networking and sharing is equally relevant for cities with well-established knowledge and practice of DRR and resilience.

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. In this regard, 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 – that is, how individuals codify/decode information and make sense of these 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 – that is, 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 neighborhood/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 5

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 Section 6 - Case Study 6

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

[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>

Further reading (see References section):

Moser & Stein 2011; Renn 2006

Box 5: 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 programs. In a corrective risk management approach, risk communication entails the co-production of evacuation plans (e.g. at neighborhood 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 neighbors 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.

See Section 6 - Case Study 6

A Risk Communication program has been at the center of the DRM process in Santa Fe (Argentina)

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>

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 politico-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.

Hence, 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 it 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. That is, 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, namely: 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 are the various alternatives for financing DRM at the local scale.

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.).

See Section 6 - Case Study 7

With national government support, the city of Manizales (Colombia) has developed mechanisms to secure financial resources for local DRR initiatives

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).

Interesting to note, though, is the fact that it is quite difficult to specifically allocate and account for money for DRR at sectoral/departmental level. Indeed, 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 woven with sectoral development, the critical point is to put in place certain mechanisms for each department to appraise and evaluate their core responsibilities and daily work with 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 also 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. Hence, 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 on reducing disaster risk (e.g. 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 and recover in the aftermath of a disastrous event, and how much money it would need accordingly). 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 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 budget, 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') could 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. Here, the most relevant funding alternatives might not be those targeted at large-scale infrastructure or development projects, but rather 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 so doing. The joint efforts of multiple cities across these networks can also aid the channeling and accessing to multilateral funding (otherwise not available to or difficult to access by individual cities).

Multilateral financing for DRR and CCA is still largely channeled to national states, although “call for funding proposals” are opening up to local governments progressively. This entails that local governments need to start aligning to 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 the 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. Furthermore, often the time, 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 emphasize on the use for ‘building back better’. The latter entails that (self-) evaluation procedures are implemented after emergencies to assess what did not work and hence should be improved.

Box 6: 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 Program for Reconstruction and the Fund for Disaster Prevention (FOPREDEN), designed in recognition of the need to promote stronger ex-ante DRM. Despite Mexican government 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 Program for Prevention supports disaster prevention by funding activities related to risk assessment, risk reduction, and capacity building for disaster prevention. FONDEN resources finance 100% of the reconstruction costs for federal assets and 50% of those for local assets. After the first time that assets are impacted by a disaster, this percentage declines, if insurance is not 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 city of Manizales has been running a voluntary collective insurance system and through cross-subsidy, higher income sectors cover the insurance costs for low-income groups or organizations working for the public good. Insurance cost is charged with the local property taxes and it is a percentage of the property's cadastral value.

Home and business insurance can give wrong incentives for settling in risk-prone areas or developing certain activities by offering a perception of safety. In addition, insurance provision is usually not available for low-income households and hence other mechanisms should be arranged – e.g. Red Cross Santa Fe (Argentina) handed in provisional cards for cash transfer 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.gfdr.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 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 the 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 6

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.

Chapter 6: Case studies

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, initiatives and catalyst potential. It is also internationally recognized as a role model city by the Making Cities Resilient campaign, for its DRR-related activities.

To 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, the AISR's CEO and representatives of Campinas Civil Defense 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, expanding across 20 cities, covering over 3,700 km² and impacting around three million people. The metropolitan scale reflects the close interrelation between the region's cities.

Making Smart Cities is the corporate social responsibility initiative of AI Systems Research Ltda (AISR), recognized by the UN and presented at the 3rd UN World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Japan, to make cities more intelligent, resilient and sustainable by supporting the development and implementation of integrated strategies and planning. The initiative aims to enable 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. Sendai Framework for Disaster Risk Reduction 2015-2030; Transforming Our World: the 2030 Agenda for Sustainable Development; Paris Agreement on Climate Change; New Urban Agenda - Habitat III; and 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. Socioeconomic development - Assessment and reduction of socio-economic impacts related to urban risks. It also allows analytical management of socio-economic development programs, 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 programs.

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

The understanding of the city context and of 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 means that the analysis of past and current situations, patterns and behaviors are not sufficient for effective management and resilience improvement. It is also necessary to analyze 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.

The implementation of the project is carried out in a growing spiral of analytical maturity. Campinas Civil Defense 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.

Author:

Fernando Britto – AI Systems Research, Making Smart Cities Initiative

E-mail: fernando@aisr.com.br

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 various 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 towards disaster risk management. Following the Guidelines of the National Disaster Management Act (2005), Himachal Pradesh developed a State Disaster Management Plan (2012), which calls for:

1. the creation of a policy, legal and institutional framework, backed by effective statutory and financial support;
2. mainstreaming of multi-sector DM concerns into the developmental process;
3. putting in place a continuous and integrated process of planning, coordinating and implementing policies and plans in a holistic, participatory, inclusive and sustainable manner.

However, there are still places in this hilly region where drivable roads and basic facilities are missing. 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 a 2011 census, approximately 20,000 villages are scattered in different districts of the state and only about 8,000 have been connected by roads. One of the sample surveys in the state highlights that the average distance of unconnected villages from the nearest motor-able road is 5.17 km in high-hill areas, 2.06 km in the low hills, and 1.41 km in plain and valley areas. Disaster management plans are available, yet are not practical and useful at the time of crisis. District administration is ill-equipped and inadequately trained to deal with disaster situations. Absence of an organized mechanism for response is generally felt at the time of crisis.

Kullu district is famous for its touristic attractions and most of its buildings such as traditional houses, castles, museums, etc. are built with “Kath-Kuni” architectural style. These structures are continuously reduced to ashes due to lack of proper fire services. At least one fire incident is being reported every day, and fire tenders usually reach the spot only after everything is destroyed. Timber is the major construction material in old traditional houses, and fire incidents are mostly reported during winter when villagers store fodder and wood.

On November 14th, 2015, in Kotla – a village located in the interior of Kullu district – a fire broke out, gutting at least 72 houses (mostly wooden). Damaged property was estimated in Rs 25 crore. An ancient temple of a local deity, Chhamahu Devta, which had very high heritage significance for local people, was also destroyed.

District administration officials deployed fire-fighting vehicles to the disaster site. However, fire tenders could not reach the affected site, since this village is situated in a remote area on top of a hill and the approach road was very narrow. Although five fire tenders were stationed near the village, their services could not be utilized.

After the incident, members from the 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 concern is that this village is situated at the top of the hill and there is no locally available water source, so it is difficult to provide water for extinguishing fire, further increasing vulnerability.

To address this issue, the local community constructed several small-sized water tanks near the village with the help of the government. Nowadays, they are using this water for fulfilling their daily basic needs and as water storage for extinguishing fires. The State Department of Irrigation and Public Health (IPH) is also maintaining an underground water tank (capacity of 7,000 liters) near the village to store water there. The State Government, through the IPH Department, has also proposed a project at the local level for preparedness and mitigation of fire risks. This project plans to construct a water lift, which will carry water from the river located in the valley to the village.

Relevant documents:

Himachal Pradesh State Disaster Management Authority, 2012. State Disaster Management Plan (SDMP).

Available at: <http://www.shimlamc.org/file.axd?file=2016%2F1%2FHP+State+Disaster+Management+Plan.pdf>

District Disaster Management Authority, Kullu District, 2015. District Disaster Management Plan (DDMP), Kullu.

Available at: <http://hpkullu.nic.in/disaster/DDMP-2011.pdf>

Authors:

Rohit Jigyasu - ICOMOS International Scientific Committee on Risk Preparedness

E-mail: rohit.jigyasu@gmail.com

Madhusudan Singh - Project Associate Disaster Management, UNDP

E-mail: er.madhusudan.singh@gmail.com

Case study 3: 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. Thus, the Greater Manchester Resilience Forum (GMRF) was established, initially under the chair of the police service and latterly the fire service, and 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.



Greater Manchester Resilience Forum

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 and 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

Over time, 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.

Therefore 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

In 2014, GM joined the UNISDR Making Cities Resilient campaign. Completing the campaign's Local Government Self-Assessment Tool (LG-SAT) through a series of multi-stakeholder analyses and discussions encouraged stakeholders across different sectors to take a new perspective on all Ten Essentials for making cities resilient, and to deepen 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, this Scorecard enables cities to measure their resilience against 90 indicators, aligning 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, engages communities in understanding risks and preparing for emergencies, together with exploring emergency response.

Since joining the Rockefeller Foundation's 100 Resilient Cities network in 2016, the city is 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:

UNISDR Making Cities Resilient campaign – Greater Manchester

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

[City%20Profile%20Of%20Greater%20Manchester%20\(Bolton%20%20Bury%20%20Manchester%20%20Oldham%20%20Rochdale%20%20Salford%20%20Stockport%20%20Tameside%20%20Trafford%20%20Wigan\)/?id=3899](http://www.unisdr.org/campaign/resilientcities/home/cityprofile/City%20Profile%20Of%20Greater%20Manchester%20(Bolton%20%20Bury%20%20Manchester%20%20Oldham%20%20Rochdale%20%20Salford%20%20Stockport%20%20Tameside%20%20Trafford%20%20Wigan)/?id=3899)

Greater Manchester Prepared

<http://www.gmemergencyplanning.org.uk/gmprepared/site/index.pp>

Greater Manchester Resilience Forum (Twitter feed): @GM_prepared

Author:

Kathy Oldham - Head of Civil Contingencies and Resilience Unit, Association of Greater Manchester Authorities (AGMA)

Email: contingencies.agma@manchester.gov.uk

Case study 4: Kampala (Uganda)

Challenges in developing an integrative resilient strategy

Kampala, the capital city of Uganda, is a fast-growing and dynamic city and regional center, accounting for 80% of the country's industrial and commercial activities. Uganda is the 14th lowest income country in the world and has 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 growth rate of 5.2%, according to the Ugandan Bureau of Statistics, and consequently, demand on 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, and the outskirts of the city borders 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, as well as planning and construction tributary drainage in informal settlements.

KCCA is implementing a low emission and climate resilient strategy known as the Kampala Climate Change Action Plan and builds on the Kampala City Strategic Plan (2014-2019). Furthermore, 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. Some of these challenges include:

- That the city's revenue streams are poor which means that they are not able to invest enough in the required infrastructure.
- There is a weak regulatory framework and land use planning, so that KCCA is not able to regulate much of the development that is happening in the city. When there are issues that require enforcement, the political figures get involved, rather than it being a technical issue.
- Land use, environmental and other policies are not coordinated to 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.
- Improving the basic infrastructure systems, including putting into place more drainage systems, solid waste management and sewerage, as well as prioritizing landscaping and green areas for water absorption.
- Continuing to communicate with and engage local stakeholders to participate.

Relevant literature:

Kampala Capital City Authority, 2016. Kampala Climate Change Action Plan. Available at: http://www.kcca.go.ug/?jsp=climate_change_strategy

UNISDR, 2016. Kampala Strives to improve resilience. New Archive. Available at: <https://www.unisdr.org/archive/48860>

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.

Author:

Dr Cassidy Johnson – Senior Lecturer, The Bartlett Development Planning Unit, UCL

E-mail: cassidy.johnson@ucl.ac.uk

Case study 5: Makati (Philippines)

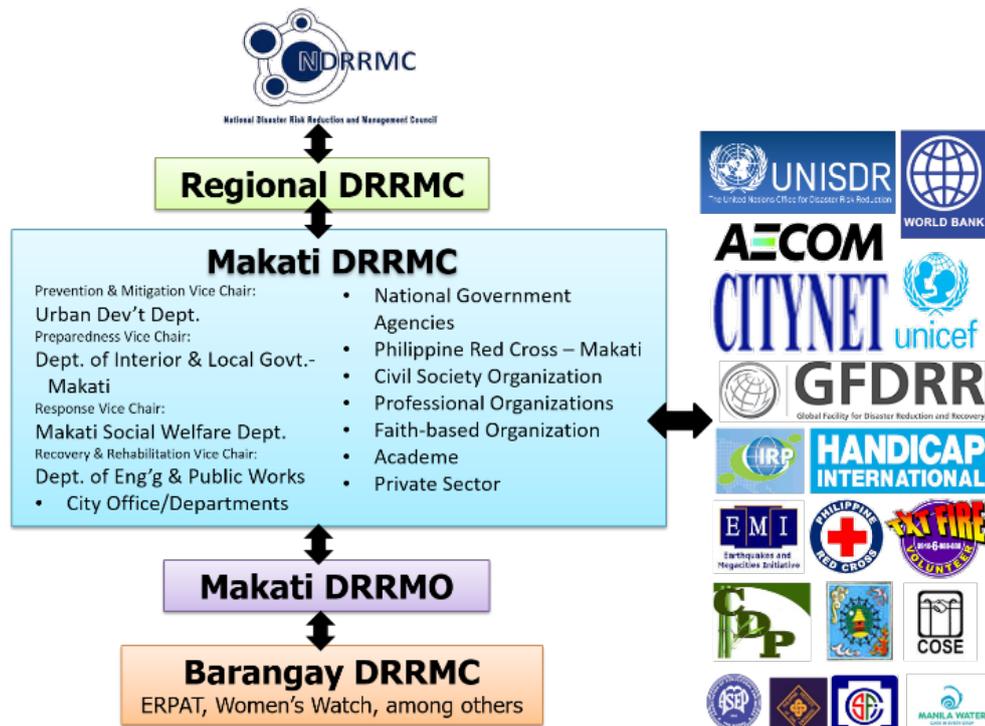
A Disaster Risk Reduction Management System

Pursuant to the Philippine DRRM Act of 2010 (Republic Act 10121), the Makati Disaster Risk Reduction and Management Council (Makati DRRMC) and the Makati Disaster Risk Reduction and Management Office (Makati DRRMO) were established in 27 February 2012 and 10 May 2012, respectively. However, even prior to the enactment of RA 10121, Makati City had already established pioneering DRRM units like the Makati Rescue (1992), Makati Command, Control and Communication or Makati C3 (2000) and the Makati Emergency Medical Services System or MEMS. At the community level, all of the 33 barangays (smallest administrative unit in the Philippines) of the City have established their respective Barangay DRRM Committees (counterpart to the Makati DRRMO).

Under the National DRRMC and Regional DRRMC, the Makati DRRMC was made as multi-sectoral as possible, and 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 Council, the Makati DRRMO is responsible for organizing and setting the directions of the City's DRRM initiatives.

In fulfilling their mandates, the Makati DRRMC, Makati DRRMO and the Barangay DRRMCs have forged partnerships with various international institutions, local organizations, government agencies, community organizations, academia and professional associations.

Through the Makati DRRMC and the Barangay DRRM Committees, relevant legislations 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 budget. RA 10121 provides for an allocation of at least five percent (5%) of the city's total revenue as the Local Disaster Risk Reduction and Management Fund.



Makati DRRM Structure and Partners

Seventy percent (70%) of this goes to disaster preparedness programs and the remaining thirty percent (30%) is allocated for 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

This is crucial for making timely decisions for relief and operations, allocating resources and manpower, and providing information to the public. Recognizing this, the Makati Disaster Risk Reduction and Management Office (Makati DRRMO), in partnership with the Philippine Institute of Volcanology and Seismology (PHIVOLCS), conducted training on Rapid Earthquake Damage Assessment System (REDAS) in 2016. REDAS is a software that can produce a simple and user- friendly simulation that can give a rapid estimate of the possible seismic hazards which can be used for inferring the severity of impact to various elements-at-risk. The training aims to capacitate city disaster managers in the use of the REDAS software, to provide quick and real-time simulated earthquake hazard information that will help them in assessing the impact of a strong earthquake for decision-making and science-based planning.

While the national scientific agencies released Risk Analyses of Metro Manila, Makati intends to provide a more accurate estimation of the impacts of

hazards, particularly earthquake, 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 approximately 1,000+ out of the 2,169 structures in Barangay Pio del Pilar were surveyed. This served as the initial input into the City's exposure database.

The initial training with PHIVOLCS gathered a pool of 27 city personnel from 14 city offices/ departments that can conduct risk assessments using the REDAS software. In its effort to continuously build its manpower complement, Makati DRRMO then replicated the REDAS training in the selected five barangays. Now, there are 33 volunteer surveyors from two of the five barangays and the Bureau of Fire Protection – Makati. Continuous training will be conducted in all 33 barangays while in the process of developing Makati's Exposure Database. Training builds the technical capacity of the members and leaders of the community, but also helps raise awareness and encourages involvement and participation in the process of resilience building.

Gender Mainstreaming in DRRM at the Local Level

The Makati Disaster Risk Reduction and Management Council (Makati DRRMC) has recognized 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. As a result, Makati City partnered with various agencies to assess gender-responsiveness of DRRM programs and projects through the use of the Gender and Development (GAD) Checklist for Designing Disaster Risk Reduction and Management Projects from the Harmonized Gender and Development Guidelines for Project Development, Implementation, Management, Monitoring and Evaluation. This was 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).

EXECUTIVE REPORT

WHAT IS REDAS?

Rapid Earthquake Damage Assessment System (REDAS) is a software/tool which aims to provide quick and near real-time simulated earthquake now with a climate change adaptation component of flood and severe wind. This was developed by PHIVOLCS-DOST thru a Grant-in Aid (GIA) from the Department of Science and Technology (DOST) and CSCAND Agencies.

Mechanism for execution:

Memorandum of Agreement (MOA) with City Resolution No. 2016-A-013

REDAS PROCESS:



DECISION MAKING:

Prioritization of local implementation of the following:
 (1) Disaster and climate change-resilient programs
 (2) Deployment of timely rescue and relief operations for contingency planning

EXPECTED OUTPUTS:

Trained DRRMC Personnel to conduct REDAS activities	Database of building structural classification and population at risk per barangay	Computation of estimated localized Building Damage, Economic Loss, and Casualties based on the built exposure database per barangay	Simulation of built exposure database to produce a localized hazard and risk maps
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2016

REDAS TRAINING

September

Accomplishments:

- ✓ REDAS Training was held last 26 September to 01 October 2016 with a stay-in accommodation for six (6) days
- ✓ Trained 27 representatives from DRRMO, UDD, DEPW, OBO, Assessment Department, MHD, OSMAK, MSWD, Liga ng mga Barangay, Dep-Ed Makati, DES, PESO, MCDO, and EEMO.



October

MAKATI'S PARTICIPATION ON THE 3RD REDAS USERS' CONVENTION

Accomplishments:

- ✓ 10 members of the Makati REDAS core group from the departments/offices of DRRMO, UDD, DEPW, Assessment Department, MSWD, and Dep-Ed Makati were invited in the Third REDAS Users' Convention held last 17-19 October 2016 with all of the invited REDAS Graduates all over the Philippines
- ✓ Presented the REDAS Application in Makati City



BUILDING MAKATI'S EXPOSURE DATABASE

The project involves survey of five (5) barangays in Makati to represent all the land-use classifications present in the City. The selected barangays are the following:

URDANETA	PIO DEL PILAR	SAN LORENZO	GUADALUPE NUEVO	RIZAL
Pure Residential Village 366 structures	Mixed Land-Use District I 2,169 structures	Commercial Land-Use 1,037 structures	Mixed Land-Use District II 2,049 structures	Residential 4,523 structures

December

URDANETA

Accomplishment:

- ✓ 366 structures surveyed and data processed with 22 REDAS graduates held last 25 and 26 October 2016

PIO DEL PILAR

Accomplishments:

- ✓ To date, approximately 1,000+ structures surveyed out of 2,169 from the field survey conducted on 6-8 December 2016 and training conducted on 13 December 2016
- ✓ Trained 33 volunteer surveyors from barangays Pio del Pilar, Urdaneta, Rizal, and BFP-Makati on 12-13 December 2016



The GAD checklist encourages a gender perspective on the various parts of the program and project development and management including assessment of gender impact through sex-disaggregated data and gender-related information, assessment of the plan to anticipate negative gender-related impact and minimize constraints, monitoring 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 program/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 emphasized the importance of identifying the 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. For example, not all women experience the same type of discrimination. An old woman will experience a different level of discrimination from an old blind widower. 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](http://w3.neda.gov.ph/hgdg/main/DRR%20GAD%20Checklist%20FINAL%20(12%20Aug%202015).pdf)

Author:

Violeta Seva - Consultant to Makati City

E-mail: violeta.seva@gmail.com

Case study 6: Santa Fe (Argentina)

Reflections of a 10-year urban DRM process

Located at an altitude of 18 meters 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 secondary city of approximately 400,000 residents – over half a million at the metropolitan scale – it has 70% of its territory represented by rivers and swamplands.

In April 2003, the city was affected by one of the worst disastrous events: the flooding of the Salado river. The river overflowed an unfinished flood protection embankment, flooding more than one-third of the city, affecting 120,000 people, killing 24 inhabitants and causing millions of dollars in damages. In March 2007, heavy rains coupled with a flood defense system that impeded rainwater runoff, causing damages once more. Access to the city was cut off and 30,000 people were displaced from their homes during a period of 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. But this time, the city would manage to withstand the situation with far fewer evacuated people and less material damages. In March 2015, heavy rains comparable to those in March 2007 resulted in 900 people being temporarily evacuated in municipal shelters for five days. And in April 2016, the combination of rains with extraordinary peak levels of both rivers affected 200 families (approximately 730 people), who had to seek provisional refuge in municipal shelters.

Nowadays, Santa Fe is considered a “good practice” case study in international circles, and 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 context where the main approach 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 has been the first municipality in developing and implementing an urban disaster risk reduction policy in Argentina. The local government has been able to not only initiate, but mainly sustain – and when necessary adapt – a local disaster risk reduction process for over a decade.

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”. On the one hand, affected residents organized around different collectives and

mobilized to claim for justice and compensation. On the other hand, an alternative political coalition made flood risk reduction a key issue of the upcoming electoral campaign. After winning the municipal elections and taking office in December 2007, this coalition decided to incorporate disaster risk management as a "state public policy" in the new urban development plan. And political commitment would be kept alive by political continuity (the same coalition would rule the city for the following three four-year administrations) and the increasing support in mayoral elections from low-income electoral districts (historically, among the most exposed and vulnerable to urban flood risk).

But to guarantee continuity in a local DRM process, especially if political changes are anticipated, other instruments are crucial. A municipal DRM ordinance was passed in 2008, creating a municipal DRM system with its corresponding organizational structure. A DRM office was set up, directly depending 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 framework. 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 disasters management to a more proactive approach. Inspiration was also taken from the Ten Essentials and subscription to the UNISDR Making Cities Resilient campaign in 2009.

Since its creation in the municipal government structure, the DRM Office has had a dual role. On the one hand, it has a specific role in relation to preparedness for response, preparedness for recovery, response, and immediate recovery. The first tasks of the office were targeted at getting ready to respond (both internally and externally) in the face of hazardous events. This has entailed the following: 1) development of general emergency protocols for heavy rains and rising river levels; 2) development of specific protocols for the DRM Office for both types of event; and 3) participatory design of evacuation routes, including selection of meeting points and temporary shelters, at neighborhood level. For all these, the DRM Office has a specific annual budget.

On the other hand, the DRM Office has a cross-cutting role for mainstreaming DRR in other sectoral departments of the municipal government. This role has been facilitated by the regular participation of DRM Office's representatives in cabinet meetings, the joint organization with the public university of DRM training for municipal employees, and the strong linkage between the DRM Office and the Department of Communications (which contributes to embedding the DRM approach internally and externally). Mainstreaming DRR across municipal departments has resulted in: 1) sectoral and integrated plans, programs and projects targeted at reducing hazard, exposure and vulnerability (e.g. gray infrastructure for flood protection; green and blue

infrastructure, including green corridors, reservoirs and urban natural reserves; waste collection and recycling; relocation and neighborhood 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 defense and pumping systems).

Besides municipal resources, the clear definition of a DRM public policy has helped secure financing - especially for drainage infrastructure and for relocation and upgrading of flood-prone settlements - from higher politico-administrative levels. What have normally worked are coordinated efforts where 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 responsibilities for projects and programs. 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 (e.g. Rockefeller Foundation and 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 politico-administrative levels fluctuate, usually according to the political color of 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

Understanding that DRM could not be an exclusive role of the state but rather requires the involvement and collaboration of all actors in the city, the municipal government created the Risk Communication program. The main purpose of the program has been to embed the new approach across the general public and specific sectors. More broadly, it responds to a greater concern for transparency and reporting back to citizens about local government's actions and responsibilities.

During the first administration, the Risk Communication program was under the Department of Communications. Thereafter, it has been under the DRM Office mandate. To inform the general public, and taking advantage of new technologies, DRM has its own section in the municipal government's website. Similarly, the municipal government YouTube channel has a specific playlist for DRM-related activities. And printed communication materials (also available online) have been widely distributed. Content wise, communication materials refer to the root causes of disaster risk, recommendations in case of emergency, and maps with evacuation routes and meeting points. Online and printed materials are combined with raising-awareness talks and workshops.

Regarding specific sectors, strong relevance 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. Moreover, the Risk Communication program coordinates the Water Route activity where school kids visit the flood defense and pumping system of the city. More recently, the Water Route has expanded to incorporate visits to storm drainage projects under construction. At university level, a DRM elective course has been designed and offered to students from different disciplines in the local public university. And there is an initiative to collect all bachelor 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. Hence, its delivery entirely depends on the good will and interest of school teachers and directors.
- Scarce 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 the first years, when the focus was on raising awareness and organizing for response, greater attention has been given to data – specifically, monitoring of meteorological and hydrological conditions and reporting to the right organizations and sectors to inform decision-making.

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

When emergency protocols are activated, representatives from different areas gather together in an Operations Centre according to protocol level. The specialized team from the DRM Office keeps the Operations Centre informed on the hydro-meteorological conditions. In addition, together with the Risk Communication Program, this team coordinates the elaboration and sharing of daily reports in emergency times. These reports are shared with key representatives of different departments, e-mailed to relevant media, and uploaded in the DRM website and social media for public consultation. Information reported 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 purposes, the DRM Office also operates its own drone with photo camera. During emergencies, sometimes they also hire a drone with video camera to record the conditions of the territory. Based on the information collected, some maps have been produced.

At the moment, the DRM Office and the Department of Water Resources are

analyzing the possibility of installing automated sensors for monitoring the conditions and operation of the storm drainage and pumping system.

Main challenges:

- Geo-referenced data across municipal government departments is 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 is mainly used for daily reporting and early warning. However, it has not been systematized to feed technical risk assessments nor future risk scenarios (at least within the municipal government).
- Coordination with universities and research centers as platforms for risk assessments and climate modeling 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

In order to improve the local DRM process, self-assessment tools have contributed to critical reflection. The municipal government completed the UNISDR LG-SAT for the first cycle (2011-2013) and has recently concluded 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 has membership in 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:

- **UNISDR Making Cities Resilient campaign.** Santa Fe is a role model city and its current mayor has been nominated champion for the campaign.
- **Rockefeller Foundation 100 Resilient Cities.** Santa Fe is developing the resilience strategy document.

- **Mercociudades.** Santa Fe presides over the MERCOSUR network of cities for 2016-2017 and promotes urban resilience as an overarching framework.
- **Red Argentina de Municipios frente al Cambio Climático.** 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 4 provinces in the Litoral 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 translates 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). And there is an 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 programs 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 for different political views and represent various interests.
- Representatives from neighboring municipalities should be invited to participate in the development of the resilience strategy for the city.

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/

Santa Fe Ciudad Resiliente

<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_SFCVF2_alta-1.pdf

Relevant literature:

Alva Hart, V. et al., 2016. Una mirada de la gestión de riesgo de desastres desde el nivel local en Argentina

Available at: http://www.developmentofpeoples.org/uploads/analysis/analysisBID__2016_Una_mirada_de_la_gesti%C3%B3n_de_riesgo_de_desastres_desde_el_nivel_local_en_Argentina.pdf

Aguirre Madariaga, E., 2015. La gestión de riesgo como política de desarrollo local. El caso del municipio de Santa Fe. In J. Viand & F. Briones, eds. Riesgos al Sur. Diversidad de riesgos de desastres en Argentina. Buenos Aires: LA RED, pp. 73–90.

Available at: <http://www.desenredando.org/public/2015/riesgosalsurArgentina.pdf>

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: http://escuelasdeinnovacion.conectarigualdad.gob.ar/pluginfile.php/3206/mod_page/content/26/CambioClimatico_web.pdf

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/gestionderiesgos/wp-content/uploads/2013/11/aprender-de-los-desastres_web.pdf

Authors:

Andrea Valsagna – Director of Communications and Chief Resilience Officer, Municipal Government of Santa Fe

E-mail: a.valsagna@santafeciudad.gov.ar

María Evangelina Filippi – PhD Candidate, The Bartlett Development Planning Unit, UCL

E-mail: maria.filippi.13@ucl.ac.uk

Case study 7: Manizales (Colombia)

Financing integrated risk management as urban development strategy

As the capital city of the Department of Caldas with about 380,000 inhabitants, Manizales in the Colombian Andes is nationally and internationally highly regarded for its holistic disaster risk management, which has been a key necessity and strategy for its urban development, despite and because of its location on extraordinarily hazardous terrain. The strategic and long-term approach has been conditioning and conditioned by 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, such as seismically-proofed refurbished public buildings, land-use planning that responds particularly to hazards related to its steep slopes such as ecological set-asides in high-risk areas, a comprehensive and profound data and information infrastructure to accurately monitor and evaluate environmental conditions, and emblematic programs like the Guardians of the Slope, which have an employment and capacity building focus to reduce vulnerabilities and mitigate hazards.

Importantly, 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 of the Global South, such as lack of political will and scarce financial resources. One example to illustrate the latter is the program Risk Management in Manizales, which has the objective to improve risk management through the strengthening of policies, strategies and instruments within the framework of development planning and sustainable development. It aims to better identify and reduce risks and manage disasters. The program and its projects and interventions were developed inter-institutionally between the local government, the Departmental Environmental Agency CORPOCALDAS and the National University of Colombia in Manizales, and implemented from 2011 to 2015 by these institutions as well as experts to work on different aspects of DRM, such as data and information systems, monitoring, technological development, culture and research.

It is financially based on two building blocks. One is the environmental tax, which Municipalities have to set at between 1.5‰ and 2.5‰ according to Colombian law. In 2009, the Municipal Council of Manizales approved to raise this environmental tax on properties from 1.5‰ to 2.0‰ for the fiscal period of 2009 to 2019, which at this moment generated annually approximately \$2,000 million (all values in Colombian Pesos). The tax income is transferred to CORPOCALDAS, which is responsible for its management and

implementation. To finance applied information, monitoring, capacity-building and research projects such as the seismic micro-zoning, development of rapid damage evaluation tools or local climate-change projections, the municipality applied for a credit of \$20,000 million from Findeter (the Colombian Development Bank) and earmarked 0.5‰ of the environmental tax to pay back this credit.

The second contribution comes from the state-led campaign Colombia Humanitaria. Due to heavy precipitation during winter 2010, a state of disaster as well as of economic, social and ecological emergency were declared (national decrees No 4579 and No 4580 of 2010). Decisions were triggered due to these emergency decrees, which led to a reform of the National Calamity Fund for emergency management and recovery in the medium and long-term, and the launch of the state-led campaign Colombia Humanitaria. Due to the effects of La Niña, Manizales decided to shift more than \$11,000 million of its initial project budget of \$20,000 to implement necessary structural works. Additionally, these \$20,000 were used as a matching fund in a winning proposal for Colombia Humanitaria, which granted \$64,600 million for long-term recovery from the negative impacts of the winter.

Hence, in total \$84,600 million (equivalent to USD 43 million with conversion rates of 2012) was invested in the city, with a majority of investments being used on structural measures like slope stabilization works, but also on non-structural actions, education and communication as well as \$8,500 million allocated to the National University of Colombia in Manizales for research.

Important factors to access these large financial resources include:

- A shared understanding of the key collaborators that a large-scale DRM project needs, 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 get the credit payback approved for a time that exceeds one government period.
- 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 provide evidence of their capacity for large-scale project management and implementation.
- A window of opportunity like Colombia Humanitaria, which, due to Manizales' established actor-network, its strategic framework and elaborated plans, was quickly utilized to submit a refined and winning proposal to the National Government.

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:

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Author:

Julia Wesely – PhD Candidate, The Bartlett Development Planning Unit, UCL

E-mail: julia.wesely.13@ucl.ac.uk

Chapter 7: 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-centered risk reduction approach that helps build accumulated resilience. As this guide has pointed to, 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, 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)	<ul style="list-style-type: none"> • Have up-to-date information on extensive and intensive risks, small and large-scale disasters, and slow and rapid onset disasters. Understand how they (may) change in relation to development trajectories, demographic trends, urbanization and climate change • Understand the timescales over which risks change and impacts occur • Have updated information of the main hazards in your region, how they change over time, and how multiple hazards may combine • Consolidate up-to-date information about exposure, vulnerability and coping capacities of people, assets and activities. Integrate scientific and lay knowledge (i.e. consider the latest available climate data and scenarios, seismic information, census data, etc. but also participatory mapping, enumerations, perception surveys, etc.) • Have updated information of critical infrastructure and services, the potential impacts of hazardous events, and cascading effects • Develop mechanisms to update data and to generate local disaster risk knowledge, enabling local actors to access and exchange risk-related information • Make sure that risk information is widely communicated and available to all stakeholders, in easy language and a usable format, so that risk information is factored in all decision-making processes

Priority for Action 1. Understanding disaster risk	Pursue resilient urban development and design (Essential 4)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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

<p>Priority for Action 2. Strengthening governance to manage disaster risk</p>	<p>Organize for disaster resilience (Essential 1)</p>	<ul style="list-style-type: none"> • 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 neighboring cities) and vertically (across different politico-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
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Priority for Action 2. Strengthening governance to manage disaster risk	Strengthen institutional capacity for resilience (Essential 6)	<ul style="list-style-type: none"> • 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 to submit to different funding opportunities • Share information and knowledge; work towards guaranteeing access and interoperability
	Understand and strengthen societal capacity for resilience (Essential 7)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Ensure appropriate legislation to safeguard ecosystems and their protective functions, including funding schemes for multiple uses and collaborative conservation • Develop programs 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 neighboring cities and broader administrative levels (e.g. region or basin) to safeguard ecosystems and their protective functions
	Increase infrastructure resilience (Essential 8)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Have a local strategy for post-disaster recovery, rehabilitation and reconstruction • Appoint a coordinating office for recovery and define roles and responsibilities for different actors/sectors • Earmark financial resources for recovery • Promote insurance coverage and other risk transfer mechanisms. Generate incentives for households, businesses, industries, etc. to purchase and/or embrace them • Consider new and/or changing risks when building back • Derive lessons from recovery processes to further build resilience

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 in 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).

Underlying disaster risk drivers: Processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity. Underlying disaster risk drivers, also referred to as underlying disaster risk factors, 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, as well as compounding factors such as demographic change, non-disaster risk informed policies, the 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, pandemics and epidemics (UNISDR 2016b).



UNISDR

United Nations Office for Disaster Risk Reduction

MAIN OFFICE

9-11 Rue de Varembé
CH1202, Geneva - Switzerland

www.unisdr.org

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