

City-wide Risk Assessment Do-It-Together Toolkit for Building Urban Community Resilience

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INTRODUCTION

Communities worldwide have greater opportunities for growth and connectedness than ever before; yet the number of people exposed to hazards, shocks, and stresses is rapidly increasing, especially in coastal cities, leading to increased risk and vulnerability. At the same time, people living in cities are themselves agents of change and have significant resources, skills, and capacities to bring to resilience efforts in their own communities and across their cities and districts.

Numerous community organizations do significant humanitarian and development work in vulnerable neighborhoods, and this is helping to build social capital and local capacity. However, they are not able to address the full range of needs related to resilience and are also frequently unable to relay unaddressed concerns – including many related to disaster risks – to corresponding municipal or national authorities, or to other potential partners.

To strengthen their resilience in the face of climate change, cities need an enhanced level of civic engagement that draws on the strength and growing diversity of urban communities and that can effectively complement formal governance structures by engaging a wider set of stakeholders to focus on resilience at the community and household level. Combined with the community-based, neighborhood approaches that community organizations have long invested in, this type of civic engagement in urban settings provides a bottom-up push to accelerate local risk-sensitive decision-making and influence development, governance and investment for effective community resilience outcomes.

To effectively act at these larger scales, organizations must take their current tools and methods and organize them in two new ways:

- To use systems thinking to analyze vulnerability and identify resilience opportunities not just within the community but at the city-scale, and
- To build coalitions of organizations that work together toward common vulnerability reduction and resilience building goals.

The second of these, building relationships and coalitions, is addressed in a companion toolkit. In this toolkit, the focus is on resilience assessment and resilience building, from a foundation of systems thinking.

Why Use This Toolkit

If you are reading this document, you probably already have some interest in doing a resilience assessment. Two common reasons are:

- Building resilience is a way of reducing vulnerability and improving well-being, and reducing the need for post-disaster response and recovery;
- Resilience is increasingly a source of funding and program support, and you want to be able to respond to that opportunity.

This toolkit was developed in collaboration with and piloted with community-based development and humanitarian aid organizations. It incorporates cutting edge resilience theory and practice and addresses issues of complexity, scale, urbanization and development.

This toolkit is also:

- ***User friendly,***
- ***Community oriented,***
- ***Comprehensive, and***
- ***Designed for organizations to implement without the need for an external facilitator.***

This toolkit is best for organizations working in cities that want to work on city-scale resilience, and organizations working in communities that find challenges that need to be addressed beyond the community-level.

What is in this Toolkit

This toolkit presents an approach for assessing city-wide community resilience that will allow you to:

- Identify community resilience priorities and needs that require city-level attention and intervention;
- Determine whether and how community and city-level resilience priorities align; and

- Identify entry points for building resilience at the community-level that can contribute to overall city-level resilience.

Before you begin, review the full toolkit. The process will go much more smoothly if you understand each step and have a sense of how they all fit together to provide a big picture for your resilience work.

The full resilience assessment process will probably take two to four months. At the end, you will not have done everything, or know everything, but you will know enough to know where your activities are already building resilience, and to pick good starting points for new work that further builds the resilience of your city.

How to Use this Toolkit

A facilitator is not required to implement this toolkit – the tools are designed to be picked up and used by anyone, and assume no prior familiarity with resilience or climate change. However, facilitation may make the process move more smoothly. The facilitator does not need to be a professional facilitator hired externally; rather, she/he can be someone from your organization or one of the coalition organizations familiar with the concepts presented in this toolkit. You could also assign different members of the coalition to facilitate different parts of the toolkit.

This document includes background information and a series of tools for implementing a resilience assessment. It also includes additional advice on how to lead people through the steps involved in this work. These “Tips for Trainers” pages are clearly identified so that they can be easily skipped by those who just want the basic information.

If you have no prior experience with resilience assessment work, we recommend that you implement the tools in this toolkit in the order in which they are presented. Each tool is designed to build on the information generated in the previous tools, and the tools are sequenced to best support understanding and application. Each tool includes a ‘time needed’ to conduct that tool; these are just suggestions. The tools could take longer to implement if you have a large group or the topic is entirely new; they could take less time with a small group or if you are building on prior work. You may also find that the initial implementation allows you to identify where you need additional information or to engage additional stakeholders, or that it highlights areas where you want to repeat a tool in more detail or with a larger stakeholder group.

If you have prior experience with resilience assessment work, please use it! For example, if your city has already done extensive risk mapping¹, bring those risk maps into the Mapping Shocks and Stresses session and use them as a starting point. This toolset should build on ALL prior work, networks, relationships and understanding. The goal of the toolkit is not to just walk you through a set of steps; the goal is to help organize prior work, fill the gaps, and generate a big picture for moving forward.

This toolkit is designed to be used by a coalition; this is because building resilience requires that you consider multiple sectors and scales and leverage the work of multiple organizations and agencies. Engaging a range of these groups from the very beginning will make your work more efficient and effective. The coalition does not have to be fully developed to implement this toolkit. As you implement the tools, the places where you have gaps in your information and knowledge will help identify who else needs to be in the coalition and what stakeholders and experts need to be a part of the resilience-building process. If you add additional coalition members part-way through your work, remember that the resilience measurement process does not need to be restarted; you can simply review with them what you have done so far and then keep going.

As you implement the tools, don't try to include and discuss every last piece of information about climate change, adaptation, disaster risk reduction, resilience, and so on in your city. Understanding resilience is about understanding the 'bigger picture'; this means that your focus should be on taking already known, and sometimes quite simple, information, putting it all together in one place, and noticing what you can see that is different when you bring it together and what it shows you about what isn't being done. Because different sectors, departments and organizations tend to work in fairly isolated ways, often no one has ever brought the information from each of those together. When you combine information this way, the results can be both powerful and surprising in what you can learn.

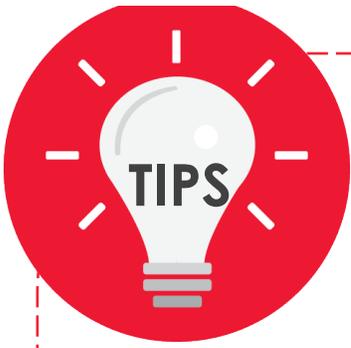
This toolkit has a set of accompanying worksheets on which you can record the information you generate when you implement the tools, synthesize information, establish the 'bigger picture', and identify key gaps in resilience. The worksheets are in the file named "Resilience Assessment Worksheets.docx" in the Workshop-in-a-Box that is available from where you downloaded this toolkit. Throughout the toolkit, there are instructions on which parts of the worksheets should be filled in for each tool. It is fine if you are unable to fill out some of the boxes in the worksheet; an empty box probably

¹ This assessment specifically focuses on **community** resilience across the city, thus it can provide an opportunity to further develop the sections relevant to community resilience in any existing plans.

indicates that you need additional information or to consult someone outside of your coalition who may know the answer. Think of these blank boxes as homework; try to find the missing information before your next meeting. Also, keep in mind that the information you put on the worksheets could change as you learn and gain new knowledge - it may be best to fill out the worksheets in pencil!

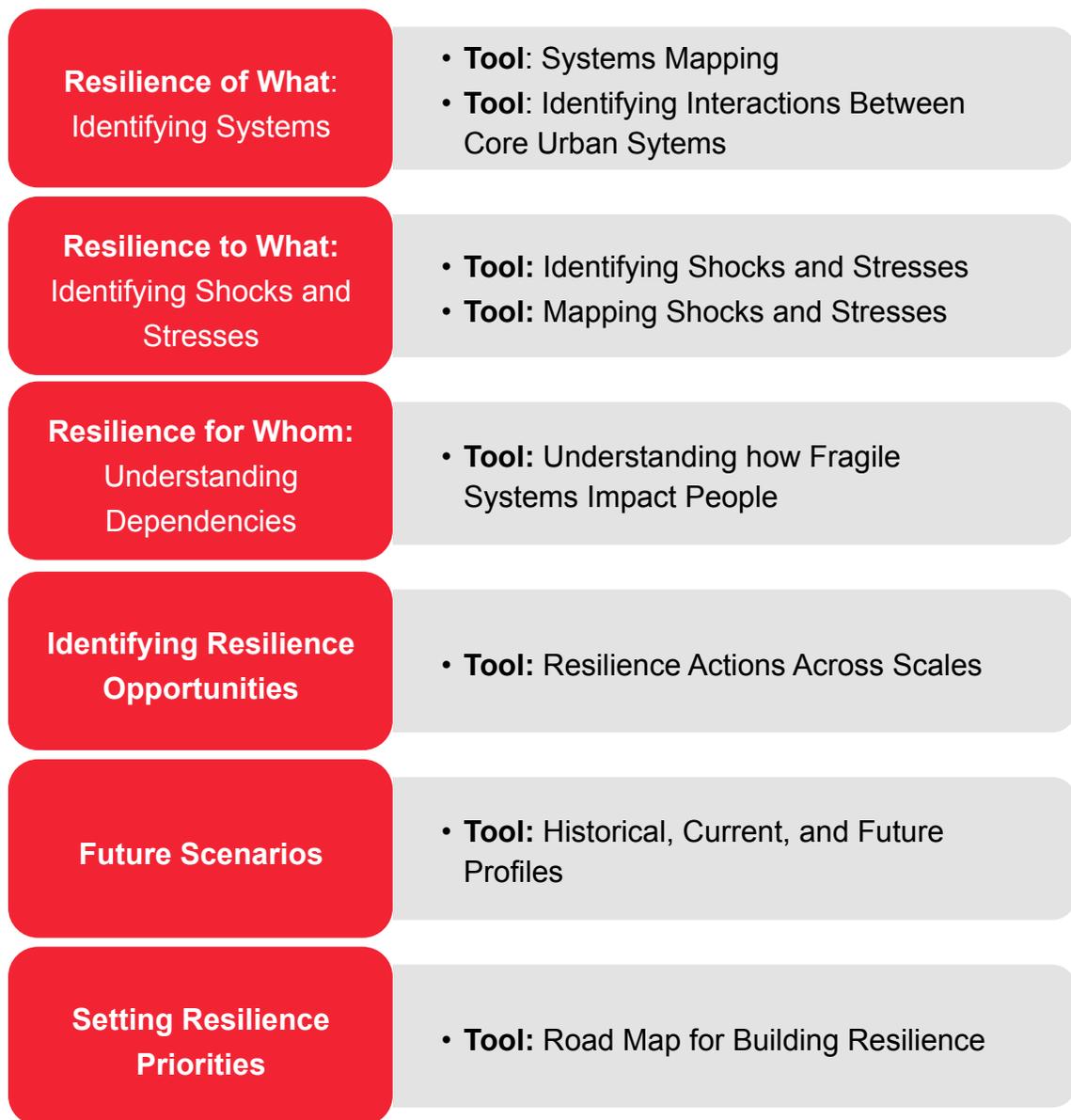
Toolkit Methodology

The approach to conducting a resilience assessment presented in this toolkit consists of six stages. The first three stages — identifying systems, identifying stocks and stresses and understanding dependencies — focus on defining the “resilience challenge” by identifying resilience “of what”, resilience “to what”, and resilience “for whom”; the fourth stage focuses on determining what resilience actions have been taken to date and whether those actions have successfully met the resilience challenge; the fifth stage focuses on how the resilience challenge may change in the context of uncertainty; and the final stage focuses on identifying resilience priorities for the coalition to tackle. Figure 1 shows these six stages and the tools that are associated with each stage.



Before starting your resilience assessment, please read the Background Information section of this document. The Background Information explains the ideas and definitions that appear in the tools, and the types of things you need to keep in mind as you assess resilience or implement resilience activities.

FIGURE 1: RESILIENCE ASSESSMENT PROCESS DIAGRAM





TIPS FOR TRAINERS

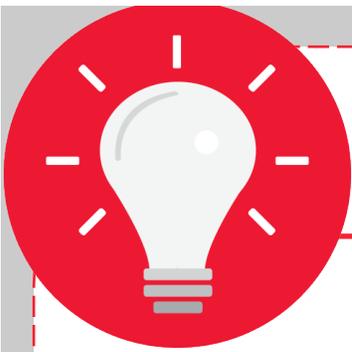
This document includes Background Reading, the assessment tools, and Tips for Trainers sections that provide additional insight and guidance about how to facilitate the various assessment stages and tools. If you're leading the resilience assessment process, facilitating the meetings or introductory workshop, or teaching other people to do this process, be sure to read the Tips for Trainers. More advanced users may also find these notes interesting, as they describe both common challenges in implementing the tools as well as ways to take more advanced users deeper into the material.

Those participating in but not leading the assessment process can skip the Tips for Trainers since they don't need to know all the details involved in how the tools are taught and implemented.

In leading a resilience assessment using these tools, please keep in mind that you don't have to use all the tools. If the group you are leading already has some experience with resilience, build on what you already have. But, make sure if you are doing this work with a coalition, that everyone in the coalition is aware of and agrees with the existing information you are bringing into the assessment.

In development, these tools and the resilience process they support were introduced to the resilience assessment team in a 3-day workshop. Based on the pilot workshops, facilitation tips for each tool and an example agenda for a training workshop are included in this toolkit. However, the introductory workshop should not be confused with the assessment as a whole.

In addition to the introductory workshop, it is necessary to take the time to engage the correct stakeholders for each step, and complete the work with each tool with your stakeholder group. Resilience is as much about process as information. The process of working through these tools together is a fundamental aspect of your resilience work, as it helps you build the relationships that are needed to implement a



TIPS FOR TRAINERS

cohesive, integrated resilience strategy and resilience activities, and establishes the value and expertise that different partners bring to the table.

Workshop-in-a-Box

If you decide to conduct an introductory workshop, you can download a workshop training kit which will support workshop delivery. The kit contains:

- A detailed agenda;
- PowerPoint presentations;
- Templates for guiding and recording workshop sessions.

The Workshop-in-a-Box is designed to support introductory workshops for both this toolkit and a companion Coalitions Building workshop. If you choose, you can download just the materials for the Resilience Assessment toolkit. However, if you are not working as a coalition for your Resilience Assessment, or if you have formed a coalition but are interested in strengthening it, take a look at the Coalitions Building materials. They were developed in combination with the Resilience Assessment toolkit, and the Workshop-in-a-Box has materials available for a combined implementation of the two toolkits.

Introductory Workshop Agenda

The agenda below illustrates how this Resilience Assessment Toolkit and its companion Coalitions Building Toolkit were introduced to pilot communities in a 3-day workshop. This introduction should not be confused with the time and effort required to actually conduct a resilience assessment.

The Workshop-in-a-Box contains a more detailed version of this agenda as well as an agenda for an introductory workshop covering just the Resilience Assessment toolkit.

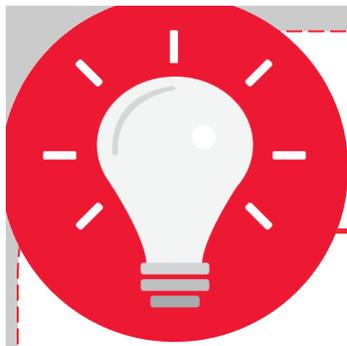


TIPS FOR TRAINERS

COMMUNITY RESILIENCE ASSESSMENT AND COALITION BUILDING WORKSHOP AGENDA

- both Assessment and Coalition
- Resilience Assessment Tools
- Coalition Building Tools

SESSION/TOPIC	TIME	OBJECTIVE
Day One		
Introduction to this workshop	1 hour	Participants <ul style="list-style-type: none">• Know who everyone in the room is• Understand what this pilot training will deliver• Understand what people expect from the workshop
Introduction to Climate Change, Risk and Resilience (Background Information)	1 hour	Participants understand: <ul style="list-style-type: none">• The basics of climate change and how it may impact their cities and nations• The difference between DRR, adaptation, and resilience• The 5 capitals plus governance framework
Mapping Systems	1 hour	Participants identify and map core urban systems in the city that have problems when impacted by shocks or stresses
Identifying Interactions between Core Urban Systems	1.25 hours	Participants understand the interactive nature of core urban systems such as food, energy, water, communication, transportation, or shelter, and how disturbances to those systems can affect vulnerable groups
Optional: Learning to See Systems	30 min to 2 hours	Participants have a real-life feel for critical urban systems, and can identify them on their own (either do by just walking outside workshop venue and focusing on just one system, or take a longer field trip further afield)



TIPS FOR TRAINERS

SESSION/TOPIC	TIME	OBJECTIVE
Day Two		
Debrief Day 1	15 min	Assure participants are comfortable using the tools presented so far in coalition
Identifying Shocks and Stresses	1 hour	Participants identify shocks and stresses and prioritize shocks and stresses they want to address in their resilience building
Mapping Priority Shocks and Stresses	1 hour	Participants map priority shock and stress risk hot spots at city scale
Understanding how Fragile Systems Impact People	2 hours	Participants determine how your priority shocks and stresses affect core urban systems, and in turn how those core systems impact the people who depend on them.
Managing Coalitions	1 hour	Participants understand the essential agreements that effective coalitions need to make
Resilience Actions Across Scales	1 hour	Participants understand current resilience building interventions across local, city, and higher scales relative to the top 3 shocks and stresses
Day Three		
Debrief Day 2	15 min	Assure participants are comfortable using the tools presented so far in coalition: Understanding Systems, Timeline/Scenario Analysis and Diagnosis of Local Situation
Stakeholder Mapping	1.25 hour	Participants have a clear understanding of which organizations and groups need to be involved in a coalition to address the prioritized shocks and stresses at various scales, both vertical and lateral
Managing Coalitions: Role Play	1.5 hours	Participants understand the essential agreements that effective coalitions need to make
Good Practices for Collaboration	1 hour	Participants understand principles and practices of individuals and organizations that make collaborations effective
Historical, Current and Future Profiles	1 hour	Create a vision of possible futures based on development and climate trends, reinforce why a resilience approach is useful, and practice systems analysis
Road Map	1 hour	Participants begin identifying resilience gaps and opportunities. As a workshop activity, develop a road map for rolling out a community resilience assessment and coalition building process.

BACKGROUND INFORMATION

Resilience

A strategic priority for the Red Cross Red Crescent (RCRC) is building stronger, more resilient communities, communities that are better able to address both daily stresses as well as sudden shocks. The International Federation of Red Cross/Red Crescent Societies (IFRC) defines resilience as:

... the ability of individuals, communities, organizations, or countries exposed to disasters, crises, and underlying vulnerabilities to anticipate, reduce the impact of, cope with, and recover from the effects of adversity without compromising their long-term prospects.²

Resilience may seem like just the latest jargon, particularly for those already engaged in adaptation and disaster risk reduction (DRR) work. However, resilience is different because it provides a way to respond to and cope with things that are uncertain, that we can't anticipate and plan for. Resilience includes core elements of disaster risk reduction, long-term recovery, adaptation, and vulnerability reduction (and likely includes some of the work you have done or are doing in adaptation and DRR).

The goal of building resilience is to reduce the impacts of shocks and stresses by increasing people's ability to access and use resources, critical services, and information to improve their lives.

Shock: an event with a clear beginning and end. Shocks take place within a few months and are not repeated. A flood or tsunami are examples of rapid onset shocks. A drought is an example of a shock with a slow onset.³

Stress: an ongoing pressure or condition. Environmental degradation (like deforestation), political instability, and chronic health issues are examples of stresses.⁴

² IFRC Framework for Community Resilience, 2014. International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland.

³ Enhancing Resilience to Shocks and Stresses, ACF-International, April 2013. Prevention Web.

System⁵: is a set of interacting or interdependent parts that together form an identifiable whole. Though often considered to be something built, such as a sewer system, road system or water system, it need not be. Examples of non-physical systems include the financial system or the governance system.

Building resilience to shocks and stresses involves:

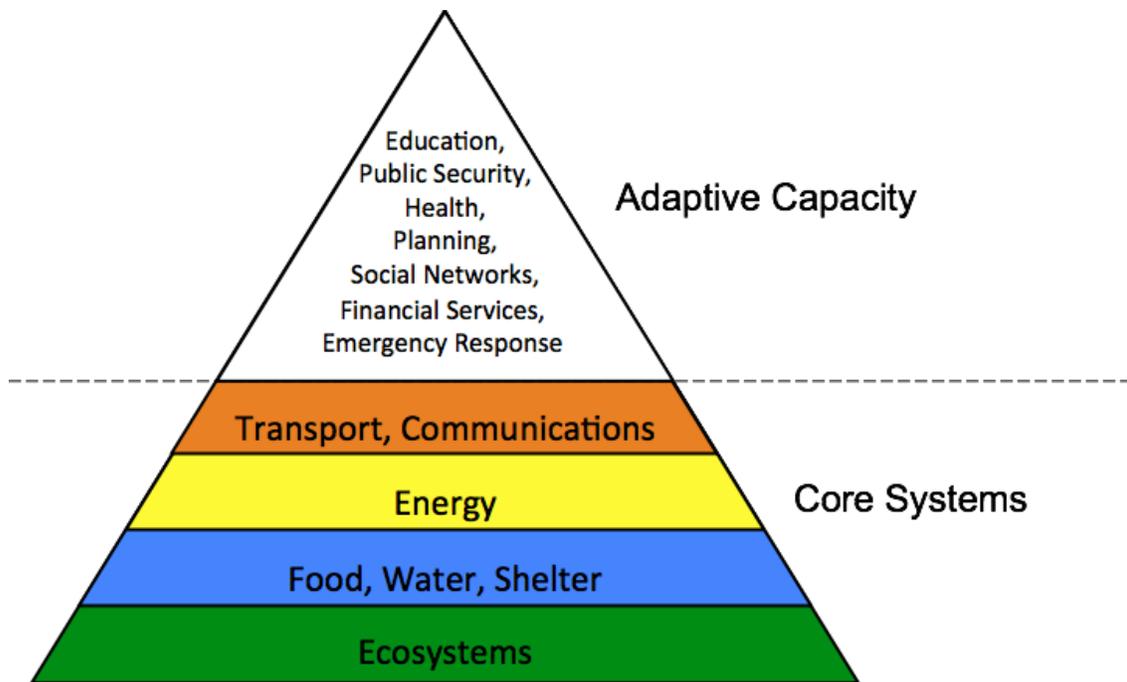
1. **Strengthening core systems**: People rely on many systems to survive and pursue livelihoods. These systems include (but are not limited to) water, food, electricity, communications, and transportation. Making sure that these critical systems keep running even during shock and stress events increases individual, community and city resilience.
2. **Increasing access to core systems**: Providing reliable, equitable access to critical systems increases resilience. This may require extending systems to areas where they aren't available, changing the laws about who can access a system, or changing the social norms around who is allowed to use the system.

Building resilience is particularly useful in situations where uncertainty makes it difficult to plan — for example, to address climate change, political instability, rapid growth, or economic instability. However, how do you plan if you don't know what you need to plan for? This is where systems thinking can help. Systems-thinking works in situations where neither the problems nor the solutions are fully known. Systems-thinking combined with resilience planning avoids overly-simplified solutions or responses, and allows for ongoing learning and questioning.

⁴ Ibid.

⁵ A system may be formal, officially recognized, supplied or regulated, or informal, emergent from local demand without official knowledge or recognition.

FIGURE 2: URBAN SYSTEM



Systems Thinking

Urban residents rely much more on systems to meet their critical needs than rural residents. Formally, in a city, water, food, energy, transportation, communications, and shelter are delivered by a network of planners, builders and managers, involving both public sector and private sector roles and institutions. Access is controlled by a network of laws, and policies as well as social norms. Many communities do not have access to some or all formal systems. This can be due to cost, laws, availability, or other reasons. These communities are often the most vulnerable to shocks and stresses. It is important to remember that many of the most important systems of concern are informal, largely unplanned, and unlikely to be robust to shocks and stresses. Additionally, systems are not just physical infrastructure but also the processes that guide actions and behaviors. Informal systems can rely on management and governance systems that are not set up to address shocks and stresses, or even long-term maintenance.

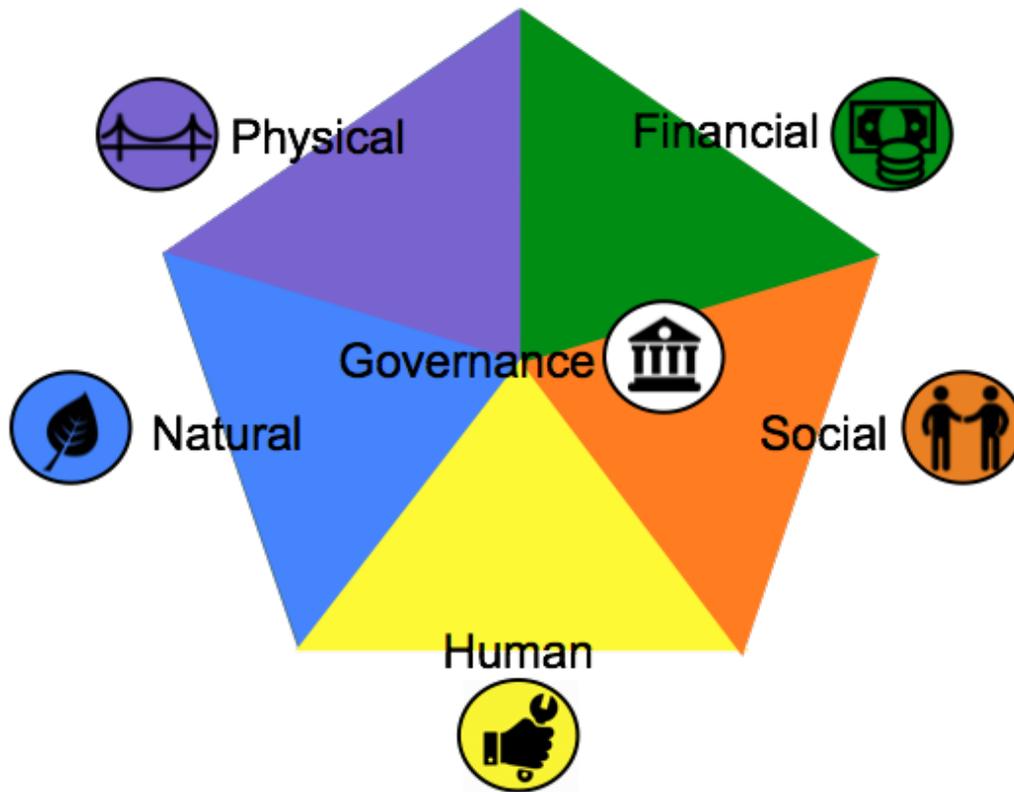
Figure 2 shows some of the systems, either formal or informal, that people rely on. The systems on the bottom of the triangle are the core systems; without ecosystems (rivers,

farm fields, forests, etc.), food, water, and shelter, survival is nearly impossible. In cities, energy, transportation and communication are also needed to support daily life and almost any type of livelihood. The systems towards the top have developed as responses to development needs and changing conditions — they make complex modern livelihoods possible.

To maintain a resilient, thriving urban environment, we need to understand the core systems, the pieces that make up those systems, and how systems are interrelated and depend on other systems to work (like needing the transportation system — roads and trucks — to supply food). Systems thinking helps us do this. Systems thinking can also be applied at different scales, from household and community level to city, regional, national and international levels.

All of the systems shown on the triangle depend on core systems to keep running, including core systems depending on one another to keep running. An impact to just one system can have ***cascading impacts***, causing failures in other systems. For example, failure in the energy system can cause a loss of communications, electric-powered transportation, lights, the ability to pump fuel or water, etc.

FIGURE 3: THE FIVE CAPITALS + GOVERNANCE FRAMEWORK SYSTEMS



This is why it is important, in building resilience, to understand:

- Where systems are weak,
- How systems are related to each other, and
- How weaknesses in one system can affect other systems.

The Five Capitals⁶ + Governance Framework shown in Figure 3 is used in this toolset to help participants look at all the different parts of a system. Complicated, interconnected systems are easier to understand when you divide them up and look at the pieces one at a time.

The definitions of the capitals in this framework are:

- **Natural capital** — the natural resource base that sustains livelihoods and wellbeing (e.g. water, forests);

⁶ DFID, 1999, <http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf>

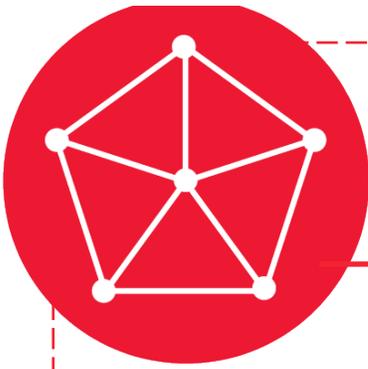
- **Human capital** — education, knowledge, skills and health of people;
- **Physical capital** — the things produced by economic activity from other capitals such as infrastructure, equipment, livestock, etc.;
- **Financial capital** — income sources and other financial resources that contribute to wealth;
- **Social capital** — social relationships and networks, bonds that aid cooperative action, connections that support the exchange of and access to ideas and resources, social norms and values;
- **Governance** — laws and policies, formal and informal rules and social norms, political and power structures.

This section is just an introduction to systems thinking, so don't worry if you don't fully understand. The Mapping Systems and Understanding Systems tools in this workbook will help you look deeply at the systems in your city and find ways to increase their resilience.

Additional Resources

If the basic concepts of resilience and systems are already familiar and you are looking for further, more detailed information, the resources below are a good starting point.

- Stockholm Resilience Center. Applying resilience thinking: Seven principles for building resilience in socio-ecological systems. <http://www.stockholmresilience.org/download/18.10119fc11455d3c557d6928/1459560241272/SRC+Applying+Resilience+final.pdf>
- Pandit, A. & Crittenden, J. C. 2015. Resilient Urban Systems: Where we stand now and where we need to go. <http://www.resilience.org/stories/2015-04-24/resilient-urban-systems-where-we-stand-now-and-where-we-need-to-go/>
- Da Silva, J., Kernaghan, S., & Luque, Andrés. 2012. A systems approach to meeting the challenges of urban climate change. International Journal of Urban Sustainable Development 4(2), 125-145. http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Resilient_Cities_2012/Digital_Congress_Proceedings/IJUSD_Article_-_da_Silva_Kernaghan_Luque_2012_A_systems_approach.pdf

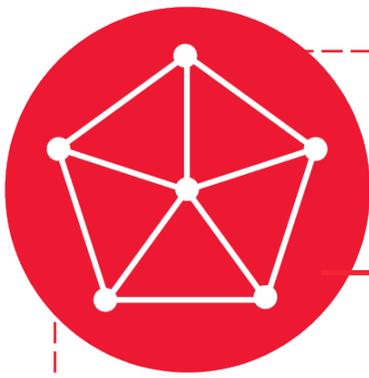


THE FIVE CAPITALS & GOVERNANCE FRAMEWORK IN ACTION

The city electricity supply and distribution system is made up of:

- Natural capital: coal, gas, water for hydropower, wind and large empty fields to catch it in, solar energy, and maybe things like bio-fuels;
- Physical capital: solar panels, wind turbines, power plants, dams, reservoirs and hydropower plants, power lines and transformers;
- Human capital: electrical utility employees, managers, owners, and customers, individual homeowners who put solar panels on their roof and the people they rely on to install and maintain that system for them;
- Financial capital: required to build, manage, maintain and upgrade physical capital parts of the system, and to hire and pay employees;
- Social capital: how people view the utility, whether they trust them, whether the utility treats all its customers equally, whether a community has the connections they need to obtain a government grant for a micro-hydro system; and
- Governance: the rules, laws, and policies by which people manage and access electricity. For example, improving or changing a utility in any way may require approval from higher-ups and permits from government.

This is not a complete list of everything that makes up the city electricity supply and distribution system, just examples to get your thinking started.



THE FIVE CAPITALS & GOVERNANCE FRAMEWORK IN ACTION

Here is another example, looking at the housing system:

- Natural capital: land to build on, access to water;
- Physical capital: wood, material for bricks or concrete, materials for roofs, access to, food, energy and other systems from your shelter location;
- Human capital: the knowledge and skills of homeowners, renters, squatters, builders, service providers (legal and illegal, formal and informal), land use planners, hazard mapping staff, building code enforcement to design, build and maintain housing;
- Financial capital: Loans, down payment, etc. required to build, manage, maintain and upgrade houses, money to hire builders, money to buy or rent land, money for home insurance;
- Social capital: affects who can build where, who has access to safe shelter locations and who doesn't, who can own land and who can't, who is reliant on informal and/or illegal services and who can access formal, legal services; and
- Governance: land use regulation and enforcement, land tenure regulation and enforcement, building codes, cultural norms which influence not who **can** but who **does** live where.

Planning for an Uncertain Future

In building resilience, once you have identified which systems you are focused on in your resilience building, the next step is to decide “**to what**” you are building resilience — e.g. floods, tsunamis, dengue — and “**for whom**” you are building resilience. This means deciding what shocks and stresses you want to be resilient to and who your resilience activities will benefit. It is important to note here that building resilience does not necessarily lead to equity but it should also not create or reinforce inequity; resilience solutions often cannot benefit everyone in a community or city. It is important to remember that resilience actions do not automatically reduce inequity. They can increase inequity without deliberate consideration of who benefits from such actions.

As soon as you start looking at “to what” and “for whom”, you will quickly see that building resilience, even to a particular type of event and for a particular group of people, is challenging due to physical, social, economic and political processes and constraints. Change processes like migration, population growth, climate change, urbanization and development all mean that the future will be different from the present, and what exactly the future will be is very uncertain.

In your resilience assessment, you will need to address the different change processes affecting your communities and city. Two important change processes, affecting community and city resilience globally, are climate change and urbanization. Using systems thinking to develop resilience actions that consider climate change and urbanization will help you find opportunities that are useful both today and for an uncertain future.

Urbanization

In 2014, 54% of the world’s population was urban, and rural-to-urban migration is expected to continue. By 2050, 66% of the world’s population is expected to be urban⁷. This growth of cities — which is called “urbanization” — creates enormous social, economic and environmental changes. These changes can benefit people; they can also increase risk for people.

Urbanization increases risk because:

⁷ United Nations, <http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html>.

- In many cities the majority of growth is happening in high-risk areas — for example in floodplains, in areas prone to landslides, and in areas with high fire risk. As these areas develop, the number of people exposed to shocks increases.
- A lot of urban growth is occurring informally, and the systems for shelter, food, water, and power in informal areas are almost always weak, increasing stresses and the likelihood of system failure.
- As land in and around cities is developed, ecosystems are degraded. Development reduces space for water and leads to more flooding. Changes in land use increase landslides during the rainy season. Groundwater is overused, causing water scarcity and reducing water quality. This increases both chronic stress and the potential for sudden shocks.
- Migration of people into cities results in a more diverse population with fewer social ties, which can result in more social conflict.
- New migrants lack social networks they previously relied on for support, which reduces their access to resources and their ability to adapt to new conditions or respond to shocks and stresses.
- New migrants are not always aware of the hazards they face and so are more likely to be surprised by shocks, and often lack the adaptive capacity needed to respond effectively those shocks.

If you want to build resilience, it is important to think about urbanization because it affects whether people can access systems, which systems they can access, and how well the systems they can access work. Over time, urbanization can also change or overwhelm the systems people rely on. For example, when new roads are built it can affect drainage and change when and where flooding occurs.

Climate Change

Climate change is affecting every location on the globe, and impacts are felt locally, regionally, nationally and internationally. What specific climate change impacts will be in any one location, however, is uncertain. Climate change will not replace current weather with a new normal; instead, weather will keep changing, there will no longer be a “normal”. This means we cannot deal with climate change by just adapting to a set of expected changes. Instead, we must build resilience to new conditions that have high variability and uncertainty.

Climate change is particularly a problem for cities. City infrastructure has been built for and is dependent on the predictability of climate-related hazard events and availability of key resources (particularly water and food). Climate change will probably increase the

frequency and size of climate-related hazard events, may create new climate-related hazard events, and will change what resources are available. This means that even if you were fine in the past, that doesn't mean you'll be fine in the future. And, if you have a climate-related problem now, it will probably be a bigger problem in the future.

Additional Resources

- Building Resilience to Climate Change: Adaptation Technical Resources. Asian Development Bank. <https://www.adb.org/publications/building-resilience-climate-change-adaptation-technical-resources>
- We Adapt Climate Adaptation Portal. <https://www.weadapt.org/subject/climate-adaptation-portal>

IMPACTS OF FUTURE CLIMATE CHANGE

There is a lot of information available on the likely impacts of Climate Change. However, most of it addresses only global or regional changes, it is presented in ways that are not easy for non-scientists to use (things like average seasonal temperature increase, when what communities need to know is how the frequency of high heat days will change), and it presents changes in temperature, precipitation, and maybe sea level rise but doesn't discuss what the impacts of those changes might be.

What you need to know to start thinking about resilience is, what are the types of changes communities in your city can expect, and what impacts will those changes have. Eventually you will want more information, but to begin it can be simple. Listed below is the information you need to start thinking about climate change resilience.

- Temperatures will increase. This will put stress on crops and on city infrastructure. It may increase power demand. Water temperature increases caused by air temperature increases, in streams, lakes and the ocean, will impact fisheries and will damage coral, weakening reefs.
- Temperature variability will increase and temperature extremes will become larger. This will further stress people and crops, and could cause power demand spikes and result in power disruption.
- Overall precipitation may increase or decrease, and timing of rainfall will become more variable. For example, the onset of the monsoon may become less predictable.
- Precipitation intensity will increase. Really heavy rains and flash flooding will occur more frequently.
- Precipitation variability will increase. Dry seasons are likely to become drier and wet seasons wetter. The difference in rainfall from year to year may increase. "Monsoon failure" and similar events may become more common.

IMPACTS OF FUTURE CLIMATE CHANGE

- Changes in precipitation and temperature may cause changes in disease outbreaks and in pest outbreaks.
- Tropical storm paths may become more variable. Tropical storms may become more intense.
- Sea levels, which are already rising, will continue to rise. The speed at which they rise will increase. Increases of as much as 1 meter by 2100 are possible.

In general, one of the best ways to think about climate change is to notice when weather is a nuisance or a problem now, and assume that problem will increase in the future. There may be entirely new problems caused by climate change, but most of the problems will be more frequent, bigger versions of things we have already experienced.

Making Resilience Tangible

What builds the capacity of people to deal with change? How can you know what makes systems more resilient? Most resilience frameworks identify key qualities of organizations, systems, or communities that make them more resilient. The following are some typical characteristics of resilience. If you keep these in mind when you are designing programs, you have some simple ideas that can help determine which interventions will build resilience.⁸

QUALITY	WHAT IT MEANS	EXAMPLES
Flexibility	The ability to meet needs when conditions change	<ul style="list-style-type: none"> • There are multiple evacuation routes in disasters instead of just one. • Community centers double as flood shelters when needed. • Staff are cross-trained so that the organization can continue to function when some staff can't get to work. • There is more than one trader to buy farming inputs from or sell crops or livestock to.
Diversity	Different parts of the system are not identical, different types of things perform similar functions	<ul style="list-style-type: none"> • Staff have different sets of skills. • Farmers plant multiple varieties of crops. • Families have different sources of income, including income from different locations (e.g. remittances from the city or abroad).
Redundancy	Systems have back-up options for when things go wrong, systems are made up of independent parts so that failure of one part doesn't break the whole system	<ul style="list-style-type: none"> • A village has multiple sources of water in case one dries up or is contaminated. • Farmers keep livestock in different places tended by different people. • A city has more than one water treatment plant. • The hospital has a back-up generator.

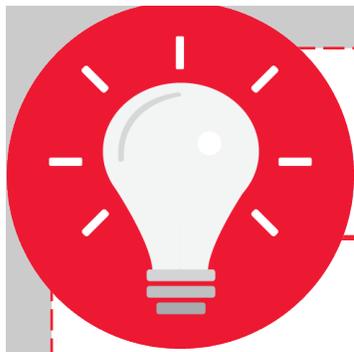
⁸ This table is adapted from Chris Allan and Karen MacClune, "Reducing Risk and Building Resilience to Disasters and Climate Change," Portland, Mercy Corps, December 2014.

QUALITY	WHAT IT MEANS	EXAMPLES
Resourcefulness (including financial resources, knowledge, information, etc.)	The knowledge and means to get things done.	<ul style="list-style-type: none"> • A city or village has the financial reserves, technical knowledge, and ability to organize to run a safe water system. • Local authorities can borrow money to rebuild infrastructure. • Communities know how to operate their early warning system, and how to connect to the national level system.
Connected through multiple relationships	People and organizations are part of networks	<ul style="list-style-type: none"> • Individuals are closely connected with neighbors, family, local government officials, as well as people in distant places such as other villages, cities, or other countries. • Businesses know of multiple suppliers even if they don't work with them regularly. • Government has relationships with NGO service providers who can be mobilized quickly in disasters.
Safe Failure	Systems are designed to fail in ways that do not cause further disaster	<ul style="list-style-type: none"> • Dams are built with spillways so they can release extra water without damage. • Crop insurance pays farmers in case of crop failure. • Levees are intentionally broken to allow flood waters into fields rather than risk an unplanned break that causes greater damage.
Ability to Learn	People make changes to improve their situation – bouncing forward rather than merely bouncing back	<ul style="list-style-type: none"> • People adapt their farming systems to deal with increasingly unpredictable weather by changing planting times, putting in irrigation, and planting a greater diversity of crops. • After a disaster, engineers re-build bridges and roads to make them stronger than before. • There are opportunities for public and private groups to talk openly and learn from disaster events.

QUALITY	WHAT IT MEANS	EXAMPLES
Transparent, accountable and responsive decision making	Social decision making is clear and fair, takes into account power dynamics in society, and favors the poor and vulnerable	<ul style="list-style-type: none"> • Land use regulations that determine fair compensation for agricultural land or restrict where you can build are open, straightforward, and equitably enforced. • Groups such as women, ethnic or religious minorities, or the elderly or handicapped are not excluded from planning or decisions.

One outcome of using this toolkit should be a new awareness of the interdependence of urban infrastructure, ecosystems, people’s livelihoods, and the rules that govern how people interact with systems to access essential services. The tool kit will help community-focused practitioners discover vulnerabilities that are made apparent only when viewed with a city-wide lens and will help city-wide stakeholders understand core challenges at the community level.

Through this new awareness participants in this exercise will also likely identify new project activities that can help improve the resilience of their communities and the city overall. The worksheets, filled in while implementing these tools, will by the end of the toolkit be a roadmap to help practitioners focus in on key activities to build resilience and clearly communicate why such activities need to be undertaken. The end result will be a set of initial concepts for actions to improve the resilience of your communities and city.



TIPS FOR TRAINERS

Participants need to read and understand the background information for the workshop tools to go well. If you don't think people will read the information, consider reviewing it as part of a meeting or workshop session. The powerpoint file included in the Workshop-in-a-Box includes slides to guide participants through the information contained in the Background Information section of this document.

One of the most powerful ways to support a group in learning this background information — which may be very new concepts and ideas — is to have them put it into their own context. Encouraging participants to discuss each of these ideas and provide examples from their own lives will make what are otherwise fairly abstract ideas much more real. The Discussion Questions below can help you start such a discussion.

Discussion Questions

1. What is changing in your city and communities?
2. How are these processes affecting you now?
3. Do you know how these changes may affect your cities and communities 10 years from now? 20 years from now? 50 years from now?
4. What kind of actions could you begin now that would help you deal with both current and possible future challenges?

Key Lessons from Background Information

1. Building resilience can help reduce the impacts of shocks and stresses in the context of uncertainty caused or exacerbated by change processes like climate change and urbanization.
2. Building resilience requires a focus on the systems that people access and use to maintain their lives and livelihoods.
3. Systems thinking can help identify entry points for building resilience. The components of systems can be thought of in terms of the Five Capitals + Governance.
4. Before you can build resilience, you need to identify 'to what' and 'for whom' you are building resilience.

RESILIENCE OF WHAT: IDENTIFYING SYSTEMS

The goal of 'Identifying Systems' is to:

1. Understand systems in your city. Systems provide critical services that people rely on for their survival and livelihoods, and overall wellbeing. Here, it is important to determine which systems people rely on.
2. Identify systems that provide key services in the aftermath of a shock or stress, where disruption would set back livelihoods and long-term recovery

This part of the methodology explores resilience 'of what' by identifying the core systems that support resilience in your communities and city. Identifying core systems helps prioritize the types of resilience activities that need to take place and focuses on who needs to be part of the coalition going forward. The latter is especially important as systems tend to be managed and operated in silos; people managing and using these systems are rarely a part of integrated resilience efforts. Bringing stakeholders that are part of specific systems to the table will make it easier to plan and implement systems-related resilience activities, and ensure that resilience activities occur as a part of a wider resilience strategy.



Tool: Mapping Systems

What is it, Why do it, What you get:

In urban environments people depend on systems for daily life. Identifying risks, building the resilience of systems to those risks, and increasing access to those systems is a good way to build resilience.

Mapping is a way of “seeing” where systems, vulnerabilities and risks are in a community. Maps can be used to show the location of health clinics, schools, water sources and shelter, or to identify places with particular risks such as areas that flood or places that deal with specific health hazards. They can also show the places where people don’t have access to things like piped water or cell phone coverage, or where there are a lot of illegal electrical connections — things that could mean the people that live there are more vulnerable. Maps also help people to understand complex relationships and make it easy to compare information. They can therefore help you understand and communicate resilience issues in the community.

In this activity, you will map the core urban systems that people depend on. Focus on systems that breakdown or have problems, and where those problems affect peoples’ lives in negative ways.

Time needed:

2 hours

Materials needed:

- A sheet of flip chart paper for each 5 to 8 people
- Colored markers (8 different colors; one set of markers per 4 to 6 people)
- Post-it notes in multiple colors
- Optional: multiple copies of a large map of the city to draw on or trace.

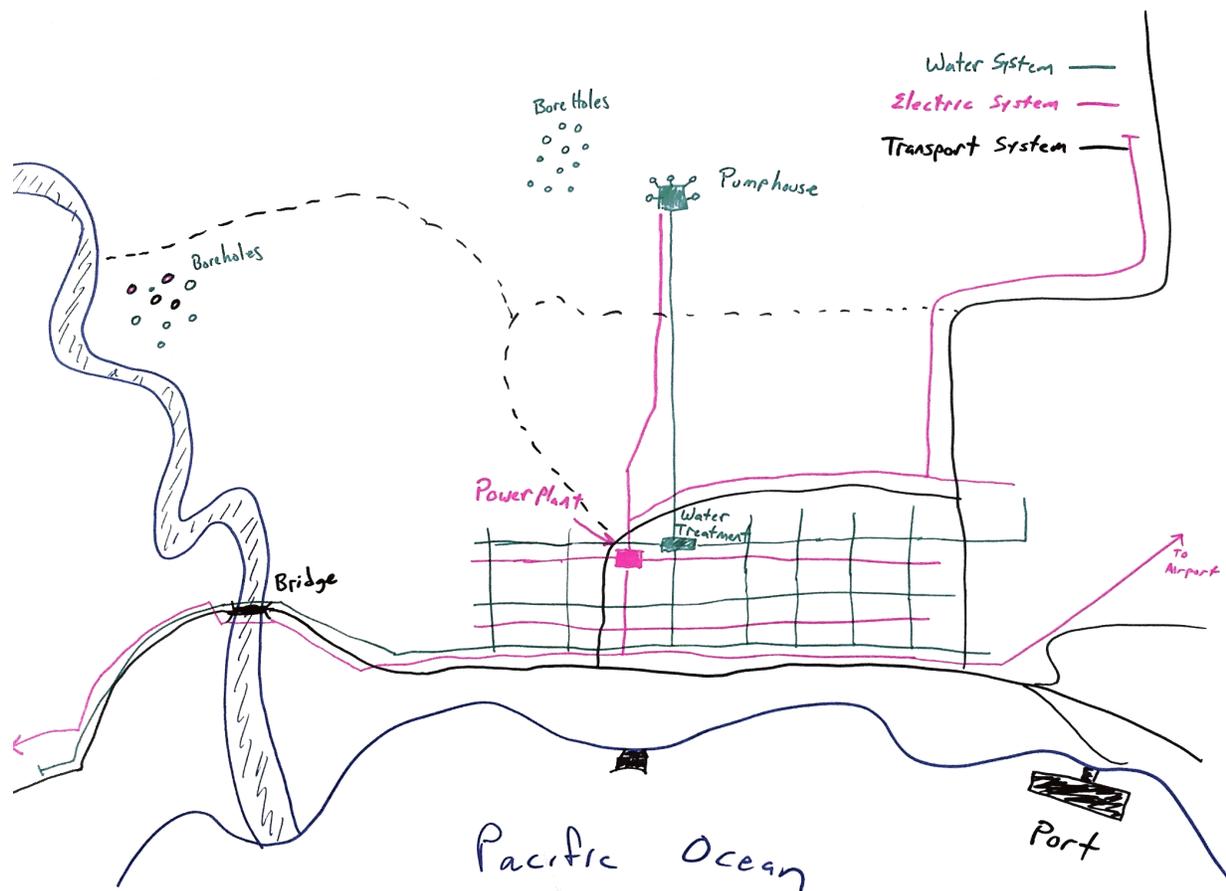
Steps:

1. As a single group, identify your core urban systems. These could include Food, Water, Shelter, Sanitation, Energy, Transportation, Health Care, or Communication. Which systems are most important will depend on local conditions and the types of problems communities face. The full group should agree on which systems you will use for the mapping. Write this down on **Resilience Assessment Worksheet 1**.
2. Assign a different marker color for each system. This will make comparing maps easier.
3. Break into small groups, with 5 to 8 people in each group.
4. Each group either sketches a map of the city or works from an existing map.
5. Add to the map of the city the urban systems you agreed on in Step 1. Draw each system in a different color. You do not need to include every element of every system; just include, for example, if the transportation system has been identified, then identify the most important roads in the city, the main roads in and out of the city, and any roads that create particular problems.
6. Come back together as a large group and discuss the Discussion Questions below.
7. If it feels necessary (i.e. the maps drawn by the different groups widely vary and the group discussion results in a new understanding of which parts of systems are most important to show on the map), create a new, clean map that shows the systems and locations agreed upon by the group.
8. Save your systems map or maps – you will use them again.

Discussion Questions

1. What are the similarities and differences between each group's maps?
 - a. Did all groups draw the same area? For example, some groups may show just the city within its legal boundaries while other groups may include peri-urban areas, water catchments, or other areas that are critical to city functioning but technically outside the city boundaries.
2. What didn't you know about? How could you find out?
 - a. Discuss as a group whether there is critical information you are missing. If you decide there is, identify someone who will look for that information and/or reach out to people who might know about that issue (e.g. see list of "Who can help you" below). Note that that person will report back on what they find to the full group.

FIGURE 4: EXAMPLE SYSTEMS MAP



Further resources

Who can help you

- Community members
- Emergency managers
- Police and first responders
- Utility operators
- Humanitarian aid organizations
- Health clinics
- City government or municipal officials and staff

Publications with further information

- City Hazard Maps: these may be available from the city planning department, the emergency management department, utilities, and so on.
- Vulnerability Assessments: these may be available at humanitarian aid organizations like the Red Cross Red Crescent, CARE, Mercy Corps, and so on.
- Disaster Risk Reduction Plans: these may be available at the emergency management department, humanitarian and development organizations, and so on.



Tool: Identifying Interactions between Core Urban Systems

What is it, Why do it, What you get:

People's lives and livelihoods in urban areas are dependent on core urban systems. If one system fails, the failure can cause impacts to other systems, resulting in cascading failures. Resilience built at the neighborhood or local level can be helpful, but it may not be enough if city-wide systems fail. For example, loss of electricity in a city can often leave city residents unable to cook, unable to charge cell phones (leading to loss of communication), and without transportation because petrol pumps, electric trams and subways require electric power. The concept of system dependency also includes protective infrastructure; for example, if an embankment protecting critical infrastructural assets (e.g. power plants, water treatment facilities) fails, the embankment failure can create cascading failures in other systems, magnifying the impact of the event.

Understanding how systems such as water, transportation, municipal administration, etc. interact in complex and unpredictable ways can motivate participants to figure out how to make coalitions work, and can increase their skill in predicting potential problems and identifying ways to increase resilience.

Time needed:

1 hour

Materials needed:

- Systems maps produced in the Mapping Systems tool
- A sheet of flip chart paper for each 5 to 8 people
- Colored markers

FIGURE 5: EXAMPLE CASCADE SKETCH FOR AN ELECTRICITY DISRUPTION



Steps:

1. As a single group, identify a past shock or stress event that resulted in the failure of city or community systems. Write this on **Resilience Assessment Worksheet 1**.
2. Then identify core urban systems that were impacted in that shock or stress event. How did the impacts to this core system cause impacts to other systems? Draw a cascade sketch of systems impacted.
3. From your cascade sketch, identify a core system many other systems are dependent on. This will be the system that is connected to the most systems in the cascade sketch. This system will be the focus of the next part of this tool.
4. Split into small groups of 5-8 people.

5. Each group draws a Five Capitals + Governance chart like that shown below on a flipchart paper.

FIVE CAPITALS	CORE SYSTEM: _____	CORE SYSTEM GOVERNANCE
Human		
Social		
Physical		
Natural		
Financial		

6. Each small group identifies where there is and there is not resilience in the core system using the five capitals. This can help you identify points of failure and points of resilience within that core system.
7. Identify how the different components of the system are governed — What are the rules, laws, policies and cultural norms that affect how the components are built, managed, accessed, etc.?

FIVE CAPITALS	CORE SYSTEM: SANITATION	CORE SYSTEM GOVERNANCE
Human	Knowledge/awareness, health Not used to paying taxes	Awareness raining by municipality
Social	Cultural rules/conventions, selling other's land, relationships with NGOs	Land regulations, building codes, some gain more than others
Physical	Pit toilets, boreholes, rain catchment, no sewer systems	Don't pay taxes, zoning, building codes
Natural	Stream, groundwater, do not own land	Land regulations
Financial	Tax revenue, savings coops	Tax laws

8. When the small groups have identified the main components and their governance, come back together as a large group. Compare your charts and discuss the Discussion Questions.

9. Based on the full group discussion, fill out the chart on Resilience Assessment Worksheet 1 summarizing the Core System conclusions you have come to.

Discussion questions

1. What is a key point of failure in the system?
2. How does the failure of this system impact other, dependent systems?
3. What are the resilience qualities in this system?
4. How do trade-offs between the capitals compensate for the impacts to (or deficiencies in) one capital?
 - a. For example, if the electricity system fails during a flood because a transformer is damaged by floodwaters (Physical Capital), what capitals allow you to fix that issue? Perhaps human capital as skilled workers are required to fix the transformer, and financial capital as money is required to pay for materials and labor.
 - b. What interventions could promote positive trade-offs between the capitals?

Further resources

Who can help you

- Community members
- Emergency managers
- Police and first responders
- Utility operators
- Humanitarian and development organizations
- Health clinics

Publications with further information

- Keating, A., et al. (2014). Operationalizing Resilience against Natural Disaster Risk: Opportunities, Barriers, and a Way Forward. Zurich Flood Resilience Alliance.
- Ian Scoones, *Sustainable Rural Livelihoods: A Framework for Analysis*, IDS Working Paper 72, 1998.
- Carney, D. (ed.). *Sustainable Rural Livelihoods: What contribution can we make?* London: Department for International Development, 1998.
- International Federation of the Red Cross, *Preliminary Analysis: The One Billion Coalition for Resilience Discussion Paper on Levels of Resilience*, March 2015.



TIPS FOR TRAINERS

Preparatory Reading from the Background Information Section

- Resilience
- Systems Thinking

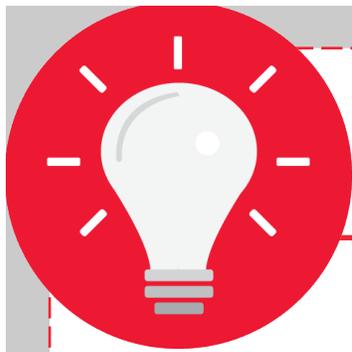
Implementing the Tool(s)

Systems Mapping is the first of several mapping tools in this toolkit. The mapping activities are designed to carefully lead participants, step by step, to a clearer understanding of resilience challenges and opportunities. As a result, it is important to do all of the mapping activities, and to do them in the order they are presented. Doing only a subset of the mapping activities, or doing them in a different order, will not produce the same results.

Mapping the systems of a whole city is complicated. Have participants start with the basic systems that tend to break down often. Are there roads that flood in heavy rains? Does the power go out frequently? Does waste accumulate somewhere? Do hospitals or clinics get overcrowded? Find the main places in the city where those things happen, or where they have big impacts. You do not have to draw every road, just the main ones that are problems. You do not have to draw every water pipe, just key parts of the infrastructure like reservoirs, treatment plants, neighborhoods with no service, or places where pipes regularly break or get clogged.

Once they understand what is being asked of them and get started, most groups will fairly quickly map out what they know well.

- If groups are having trouble getting started, remind them, “Focus on systems that breakdown or have problems, and where those problems affect peoples’ lives in negative ways”.
- If groups get stuck trying to represent things that don’t have a specific location within the city, have them write it on the side of the map.
- If groups are moving very slowly and trying to capture every detail, remind them to just map major issues and things that are obvious. Resilience is generally



TIPS FOR TRAINERS

about taking things that are commonly known and putting them together in new ways – it doesn't require digging into tiny details. Getting too detailed will just slow you down.

A key element of this and the other mapping exercises is getting participants engaged and working together to develop a common understanding of the strengths and challenges faced by their city. Therefore, exact geographic information is not required, particularly at the beginning of your resilience work. Group members should avoid investing a lot of time in trying to capture precise geographic information. Following this initial engagement, if the group determines they need accurate maps, they can be prepared.

As soon as groups start slowing down with their mapping, bring people back together as a large group to compare maps. When the small groups come back together, they should start by comparing what they drew. However, be sure to also have people notice the systems that none of the participants knew much about. These gaps in knowledge indicate areas where the assessment group will need to find people in the city who know more and learn from them.

As you lead the mapping exercises, keep in mind and be prepared to address the following:

- **Mapping can require a lot of time and space to work in.** Participants need to be informed in advance of how long the session may take.
- Conflicts may result if inequities become apparent or old hostilities are rekindled.
- One person may dominate or direct drawing if the facilitator does not adequately guide the group.

Additional Activities

Prior to conducting the tool, it may be useful to conduct the 'Learning to See Systems' activity as a means to give resilience assessment participants or trainees practice in identifying core urban systems in their own locations (see Box 1). This is a learning exercise, so it is not necessary for the implementation phase of the assessment. It can nevertheless be useful for developing a shared way of thinking about urban systems and how people use them.



TIPS FOR TRAINERS



BOX 1. ACTIVITY: LEARNING TO SEE SYSTEMS

Time needed: ½ hour to 2 hours

Materials needed:

- Work with workshop organizers, facilitators, translators in advance to explain goals, select location.
- If you use the photo option, use the photos from the Workshop-in-a-Box or photos of your own city.

Description:

Option 1: As a group, visit an urban area and identify the critical urban systems that are visible and invisible (food, energy, water, communication, transportation, shelter).

Option 2: Using photographs, perform the same exercise. Below is a sample of how you might use a photo to teach how to pick out the systems in an urban environment.

Facilitators lead a discussion of critical urban systems that can be seen, can't be seen, and/or are missing, how shocks/stresses might impact those systems, and what failure of those systems might do to other systems (cascading failures).

Discussion:

1. What systems do you see? Which systems do you NOT see?
2. What systems in this area tend to breakdown? What causes them to break? Who is most affected?
3. How are other systems affected by that disruption?
4. What are possible Disaster Risk Reduction, Climate Change Adaptation and/or resilience interventions to improve the situation at the local, city, or other scale?
5. Who/what departments or organizations would you need to engage to make those interventions happen?

RESILIENCE TO WHAT: IDENTIFYING PRIORITY SHOCKS AND STRESSES

The goal of 'Identifying Priority Shocks and Stresses' is to:

1. Identify shocks and stresses that your city faces frequently.
2. Prioritize the shocks and stresses you will focus your resilience activities on.

What needs to be done to build resilience highly depends on the shocks and stresses you need to be resilience to. Prioritizing key shocks and stresses will help you focus your resilience assessment. However, by keeping the multiple key shocks and stresses you want to be resilient to in mind as you work through the rest of the assessment activities, you can also make sure that resilience actions to respond to one shock or stress don't increase your risk to other shocks and stresses. For example, in a city at risk of both sea level rise and earthquakes, a sea wall built to keep out rising waters could catastrophically fail during an earthquake.



Tool: Identifying Shocks and Stresses

What is it, Why do it, What you get:

Shocks are sudden onset events, such as a flood or economic crash. Stresses are slow onset conditions, like migration, or chronic issues like poverty. Stresses erode resources over time and enhance vulnerability. In this activity, participants will explore the major shocks and stresses in their city and select the top shocks and stresses they wish to focus on for their resilience assessment.

Time needed:

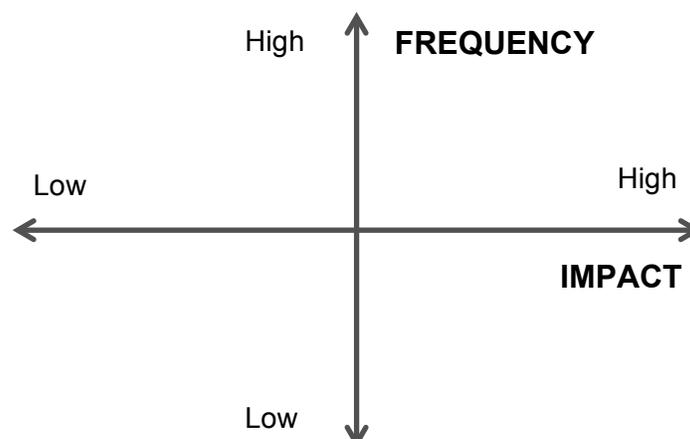
1 ½ hours including discussion

Materials needed:

- A sheet of flip chart paper for each 5 to 8 people
- Colored markers
- Post-it notes
- Sticky dots

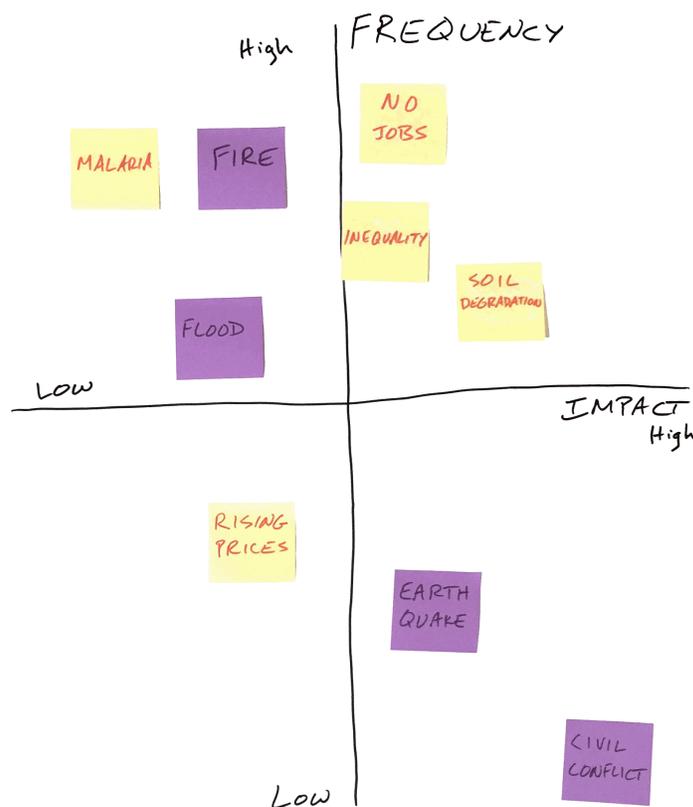
Steps:

1. Divide participants into groups of five to eight people.
2. Each small group creates a copy of the frequency/impact chart shown below. Use a full sheet of flip chart paper for each chart.



3. Each small group identifies shocks that affect the city as a whole or communities within the city. Write each shock on a separate post-it note. Use the same color sticky note for all shocks.
4. Now, repeat, writing stresses on another color sticky note.
5. For each shock or stress, discuss where it should go on the chart. Does it occur frequently or infrequently? Does it have high impact or low impact?
6. Stick each shock and stress where you feel it belongs. Exact location matters less than where each is relative to other shocks and stresses.
7. Once you have the main shocks and stresses, each small group identifies the top shocks and stresses they think the resilience assessment should address. Write these next to the chart.
8. Come back together as a large group and post all the charts on the wall side-by-side.
9. Discuss the Discussion Questions below.
10. When, as a full group, you have identified your top shocks and stresses, record them for later use on the frequency/impact chart on **Resilience Assessment Worksheet 2**. Record the shocks and stresses in the appropriate quadrant (e.g. high frequency/high impact, low frequency/high impact, etc.).

FIGURE 6: EXAMPLE SHOCKS AND STRESSES CHART



Discussion Questions

1. Did all the groups come up with the same priority shocks and stresses?
 - a. If no, discuss why you have picked different shocks and stresses. Use the charts to understand the differences between the groups – how do the charts differ?
2. If the group is focused on, for example, just high frequency/high impact events, discuss:
 - a. Are there low frequency/high impact events that might be more of an issue because there is less attention being paid and less adaptive capacity within communities?
 - b. Are there high frequency/low impact events that require constant low-level attention that are draining resources and capacity from other actions?
3. Continue discussing until the whole group can agree on which shocks and stresses to prioritize, and which quadrant of the chart they are in. If needed, use some form of voting (e.g. sticky dots) to speed up selection.

Further Resources

Who can help you

- Local aid organizations
- Social services agencies
- Health workers
- Emergency response personnel
- Disaster risk reduction and climate change adaptation specialists
- University researchers

Publications with further information

- Community vulnerability and capacity assessments
- Disaster risk reduction plans
- City or national level hazard, vulnerability, adaptation, and resilience plans



Tool: Mapping Priority Shocks and Stresses

What is it, Why do it, What you get:

In the previous activity, you prioritized the shocks and stresses you will focus your resilience assessment on. In this activity, you will map the areas in the city that are affected by your priority shocks and stresses. For example, if you have identified floods as a key shock affecting your city, you will indicate on your map where the core urban systems like transportation or energy are most affected by floods. This activity is similar to the Hazards/Risk Mapping activity in the VCA, with a greater emphasis on systems rather than simply assets.

Time needed:

2 hours

Materials needed:

- The maps you made in the Mapping Systems activity
- Flipchart paper
- Colored markers (8 different colors; one set of markers per small group)
- Post-it notes in multiple colors

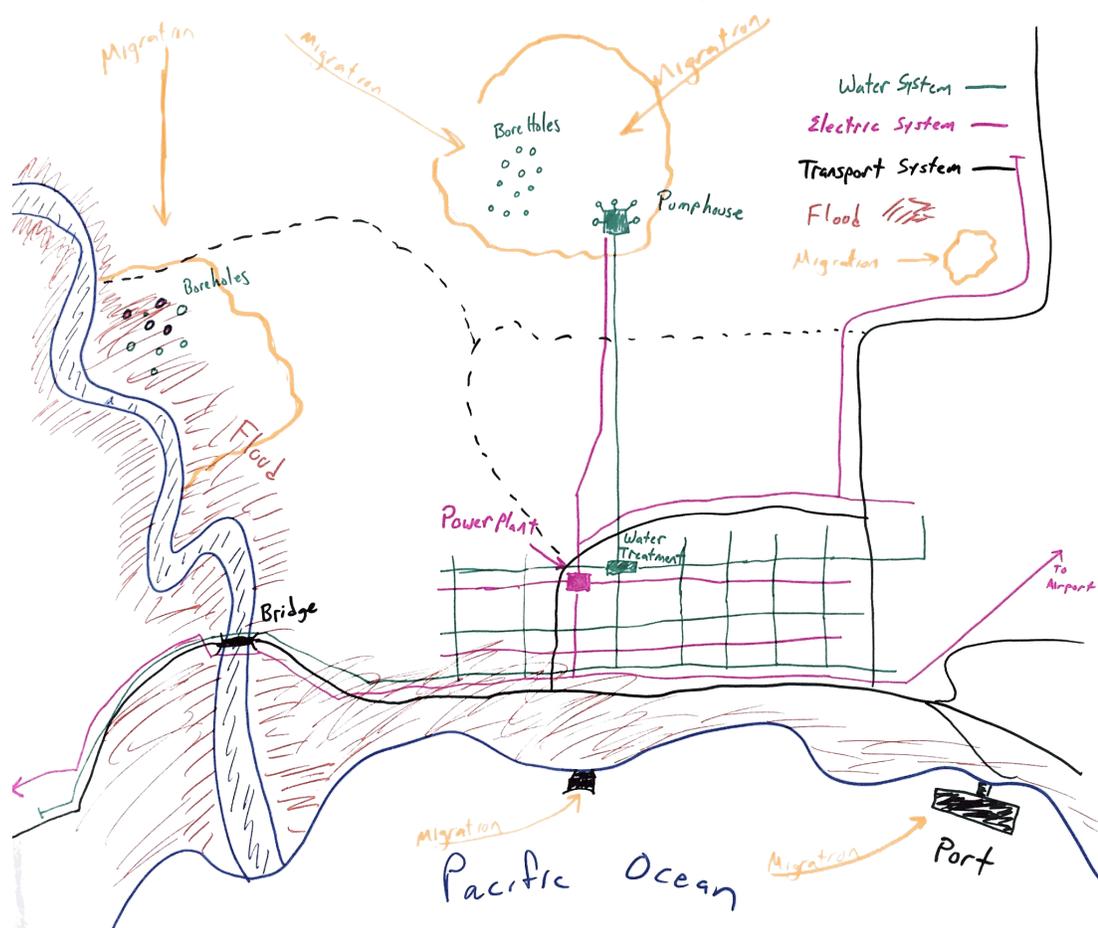
Steps:

1. As a single group, go back to **Resilience Assessment Worksheets 1 and 2** and review the priority urban systems you picked for the Mapping Systems activity and the priority shocks and stresses you picked in the Resilience To What activity.
2. Assign marker colors for each shock and stress so that all groups are using the same colors on their maps. This will make comparing maps easier.
3. Briefly review your Systems maps from the first activity in the toolkit. Decide whether you will hand these maps out to small groups to continue working on, or if you want to create a new map that combines the information from the previous

maps. If you create a new map, each small group should make a copy. This can either be a hand drawing or based on an existing city map.

4. Break into small groups of 5 to 8 people.
5. Each small group adds to their map areas in the city where the priority shocks and stresses most affect the priority urban systems. Mark these areas using colored markers; you can circle areas impacted, use hatch marks, or mark them in any other way that works for you.
6. Come back together as a single group and discuss the Discussion Questions below.
7. If it feels necessary (i.e. the maps drawn by the different groups widely vary and the group discussion results in a new understanding of where shocks and stresses most impact systems), create a new, clean map that shows the systems, shocks and stresses agreed upon by the group.
8. Save your map or maps – you will use them again.

FIGURE 7: EXAMPLE OF SHOCKS AND STRESSES MAPPED ONTO THE SYSTEMS MAP



Discussion questions:

1. What are the similarities and differences between each group's maps?
2. Did groups identify the same areas for each shock and stress? If the maps drawn by different groups are very different, spend some time discussing how you would turn all the different maps into one final map. You don't need to do this, just discuss it.
3. Which systems are most disrupted by the prioritized shocks and stresses? Write this information in columns **a** and **b** of the chart on **Resilience Assessment Worksheet 4**.
4. What didn't you know about? How could you find out?
 - a. Discuss as a group whether there is critical information you are missing. If you decide there is, identify someone who will look for that information and/or reach out to people who might know about that issue (e.g. see list of "Who can help you" below). Note that that person will report back on what they find to the full group.

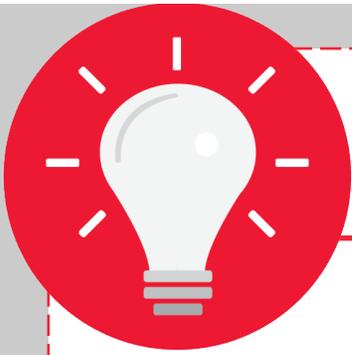
Further resources

Who can help you

- Local planning departments
- Emergency management personnel
- Police and first responders
- Utility operators
- Community members

Publications with further information

- The Hazards Mapping tool in the IFRC VCA manuals



TIPS FOR TRAINERS

Preparatory Reading from the Background Information Section

- Resilience
- Systems Thinking
- Planning for an Uncertain Future
- Making Resilience Tangible

Implementing the Tool(s)

If these tools are being introduced in a three-day workshop, have participants identify main shocks and stresses, and then from those select three to prioritize. Add more shocks and stresses to the discussion and post them on the chart only if there is time. However, emphasize that when the group implements this tool as part of a resilience assessment process, they should more broadly explore shocks and stresses. Three priority shocks and stresses cannot address everything relevant for resilience.

During the priority shocks and stresses discussion, participants will probably focus on the high intensity, high frequency events. Make sure to have them also discuss low intensity, high frequency events and high intensity, low frequency events.

The low intensity, high frequency events are important because they can be overlooked or minimized by those not impacted by them, but they can be gradually eroding resources or preventing investment and capacity building elsewhere. For example, chronic health issues or regular flooding events can take up time and energy that could otherwise be used to build up capital.

The high intensity, low frequency events are important because, though they are rare, when they do hit they are often completely unexpected and people lack adaptive capacity, or sometimes even coping capacity. Though these events may



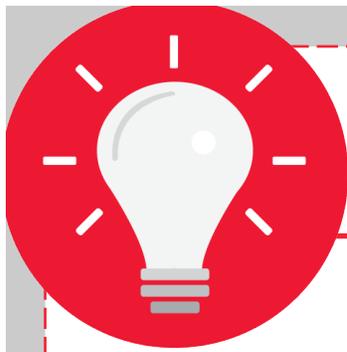
TIPS FOR TRAINERS

not be where you want to focus your resilience building, this is a good area to review as you come up with other resilience actions to see if they will also provide benefits for the high intensity, low frequency events.

If you are just starting resilience work, the low frequency, low impact events are probably things you won't focus on for now. However, it is worth reviewing to see if actions to address other shocks and stresses that have been prioritized can also provide resilience to these events. If so, make a note of these co-benefits.

If you have the time and capacity, or if you have specific issues in your city and community that warrant it, discuss how to categorize the impact of very slow-onset stresses — things like water contamination, sea level rise, or growing inequity or conflict. These have the potential to be very high impact, but may not yet have much impact at all beyond small communities or isolated households within the city. Part of resilience is the ability to think about not just now but also about how things will change in the future. The future scenarios section will address this more directly, but it is useful to begin this thinking early in your resilience process if people are ready for it.

In the Mapping Shocks and Stresses tool, pay attention to whether people are mapping the location of the shock or stress itself, or the locations where that shock or stress has impacts. For example, with coastal flooding, the areas directly impacted will be along the coast and perhaps in low-lying inland areas where drainage is affected. However, the impacts may be felt much more broadly if that flooding impacts business areas, schools, medical facilities or key roads and bridges.



TIPS FOR TRAINERS

You can use this idea of the location of the shock/stress vs. the impacts of the shock/stress to encourage participants to talk about cascading impacts of their shocks and stresses. Questions you can pose to encourage this type of thinking include:

- Do the shocks and stresses indirectly impact populations or businesses that depend on those ecosystems and locations?
- Do the shocks and stresses cause other shocks and stresses (i.e. a wildfire which increases the risk of landslides; floods which result in disease outbreaks)?

RESILIENCE FOR WHOM: UNDERSTANDING DEPENDENCIES

The goals of “Understanding Dependencies” are to:

1. Determine the impacts of shocks and stresses on systems.
2. Identify which systems are fragile.
3. Identify which groups of people will be most affected by the failure of those systems and why those people are affected.
4. Identify the stakeholders involved in managing those systems.

Identifying ‘for whom’ you are trying to build resilience will enable you to further focus your resilience actions. In cities in particular, the people affected by a system’s failure are not necessarily located in the same location as the system itself. Therefore, the impact of system failure depends on both the **exposure** and the **sensitivity** of different groups of people and stakeholders to system failure.

Exposure is primarily a function of geography. For example, the failure of a transformer will cause power outages in the area it serves and therefore affect the people in that area. However, people located in other parts of the city may also be exposed if they are dependent on the power in that part of the city for transportation, communication, livelihoods activities, etc.

Sensitivity is the degree to which a given community or population is affected by system failure. For example, for a power disruption, people with backup power or those who are less dependent on power will be less sensitive.



Understanding How Fragile Systems Affect People

What is it, Why do it, What you get:

In this activity, you will further explore how your priority shocks and stresses affect core urban systems, and in turn how impacts to those core systems affect the people who depend on those systems. This will help you identify vulnerable communities within your city, but from a systems dependency perspective rather than a VCA perspective.

The primary difference between this tool and a vulnerability assessment is the focus on not just who is exposed — such as the household or business who is suddenly without power — but who is most sensitive — which people or businesses will be highly affected by a power failure. You may find that those that are affected by system failures are not necessarily located in the vicinity of the fragile system. For example, if there is a single bridge across a river, failure of the bridge can make it impossible for workers living on one side to get to the factories on the other side, impacting both households and the factories.

You will also consider the other stakeholders involved in providing or maintaining the system. For example, if the piped water system is impacted, how does that affect water tankers who provide an informal water supply system within the city? And, you will consider the interconnections between those affected by the failure of a given system — such as the businesses that are affected by a power failure — and how the impacts to those businesses affect other areas and sectors within the city.

Time needed:

2 hours

Materials needed:

- A sheet of flip chart paper for each group of 5 to 8 people
- Colored markers
- Systems, Shocks and Stresses maps produced in previous activities

Steps:

1. As a single group, review your core systems and priority shocks and stresses identified in previous tools and recorded on **Resilience Assessment Worksheets 1 and 2**.
2. Discuss how to rate the impact of shocks and stresses on systems. Use a scoring system that identifies significant, medium, low and no impact. For example, you could use numbers (3 = significant impact, 2 = medium impact, 1 = low impact, 0 = no impact), symbols or different colors of markers (red = significant impact, orange = medium impact, green = low impact, blue = no impact). Make sure that all members of the group understand the scoring system. Write the rating system on a sheet of flipchart paper and post it at the front of the room.
3. Split into small groups, with 5 to 8 people in each group.
4. Each small group draws a table on flip chart paper like the table shown on the next page. It will need a row for each of your core systems and a column for each of your priority shocks and stresses.
5. List your priority shocks and stresses across the top of the table. List your core systems down the left side of the table. Write your scoring systems next to or below your table.
6. In each small group, discuss and agree on the impact that each of the shocks/stresses has on each of the systems. Fill the impact numbers into the table as you go. Write down next to the table any key issues that lead to the scores assigned, and any disagreements on the scores.
7. Come back together as a large group and compare your tables. Discuss any significant differences.
8. As a group, decide what score you will assign to each shock/stress and core system. Use this information to fill out the table on **Resilience Assessment Worksheet 3**. Be sure to include your scoring system, key issues that led to the assigned scores, and any scores where there was significant disagreement. Note also any places where the group didn't have the information they needed to accurately rank a shock/stress—system combination.
9. Now, review columns **a** and **b** of the table on **Resilience Assessment Worksheet 4** where, in the Mapping Priority Shocks and Stresses tool, you recorded which systems are most disrupted by which shocks and stresses. Based on your table on **Resilience Assessment Worksheet 3**, do you need to change any of your answers on **Resilience Assessment Worksheet 4**?

	SEA LEVEL RISE	FLOOD	CHRONIC HEALTH ISSUES
Transport	3	2	0
Food	1	1	0
Water	1	2	0
Sanitation	3	3	0
Energy	0	1	0
Health Care	1	2	2
Communication	0	1	0

3 = high impact
2 = medium impact
1 = low impact
0 = no impact

10. Return to your small groups. For each **high impact** ranking in the table above, identify the **stakeholders** for that system, especially stakeholders who are dependent on the system and are sensitive to the failure of that system.
 - a. As you do this activity, do not just pick the classic vulnerable groups (i.e. disabled people, pregnant women, elderly, children). Really think about groups that depend on those systems for their wellbeing and livelihoods. Facilitators should model an initial example, as this could be a new way of thinking for the coalition members.
11. Come back together as a large group and set up the following template on flipchart paper (this template corresponds to the table on **Resilience Assessment Worksheet 4**).
12. As a group, compare the stakeholders identified, using the discussion questions below, and fill out the template accordingly.

a. Shock/ Stress	b. What systems are most disrupted by this shock/ stress?	c. Who is most affected when this system is disrupted?	d. Who is already working on this/ who has power to influence this system?
Sea Level Rise	Transport Sanitation		
Flood	Sanitation		
Chronic Health Issues			

13. Based on your discussion, fill out columns **c** and **d** of the table on **Resilience Assessment Worksheet 4**. Include notes about any disagreements, places where you lack information, or stakeholders you have identified that you need to reach out to.

14. If all or some of the most affected communities or groups identified have distinct locations, indicate where they are located on your Shocks, Stresses, and Systems maps.

Discussion questions:

1. Which systems are most disrupted by the identified shocks and stresses?
2. Which stakeholders are most affected by/most sensitive to disruption to those systems?
 - a. Do you work with those stakeholders? If not, who does?
 - b. Why are these stakeholders affected by the fragility of these systems? Is there another capital that could be increased to help compensate for their sensitivity to this system failure?
3. Who are the stakeholders maintaining or responsible for these systems? Who has power to affect whether these systems work or not?
 - a. Are you connected to these stakeholders?
 - b. Are these stakeholders a part of your coalition?

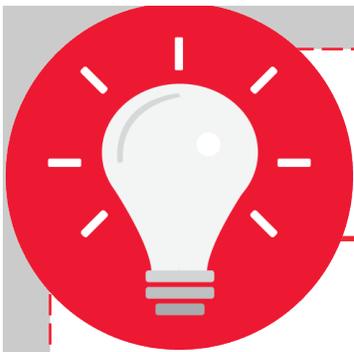
Further resources

Who can help you

- Civil Society Organizations
- Community members
- Humanitarian aid organizations
- Emergency management personnel
- Utilities personnel
- Police and first responders

Publications with further information

- Vulnerability and capacity assessments



TIPS FOR TRAINERS

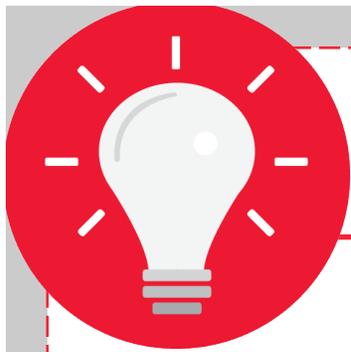
Preparatory Reading from the Background Information Section

- Resilience
- Systems Thinking
- Planning for an Uncertain Future
- Making Resilience Tangible

Implementing the tool(s)

The biggest challenge in implementing the Understanding How Fragile Systems Affect People tool is probably going to be getting participants to look beyond their standard conceptions of vulnerability — i.e. the poor, elderly, disabled, female headed households, etc. — and get them to explore vulnerability instead from the perspective of access to systems and how the fragility of the systems they depend on creates vulnerability. Yes, the poor, elderly, and female headed households are often vulnerable, and that vulnerability is usually because they live in locations with higher exposure to shock events, they are subject to chronic stresses that reduce their resources and capacity to respond, and shock events and chronic stresses are more likely to impact their access to core systems they rely on to survive. For example, for the poor, it isn't their lack of money that is fundamentally an issue, it's that when they get sick, they don't have the money to access health care. A low-cost clinic, or drainage improvement and water source protection efforts, might be as effective to reducing their vulnerability as improved livelihoods.

You will also likely need to encourage participants to consider cascading impacts and how events in one location can impact people in other areas of the city because of their connections to people, businesses, or systems located in the impacted area.



TIPS FOR TRAINERS

Additional activities

If the participants find the ideas in this section challenging, particularly the difference between sensitivity and exposure, it may be useful to conduct the Ball Toss game on the next page prior to implementing the tools.

BOX 2. ACTIVITY: BALL TOSS GAME

Objectives:

- Re-energize group.
- Demonstrate the difference between exposure to and sensitivity to a hazard.

Time needed: 15 minutes

Materials needed: One ball (soft, hand-sized ball; or anything soft and toss-able)

Steps:

1. Assess participants and ensure all abilities can access game.*
2. Introduce the game as illustrating the difference between being exposed to an impact and being affected by (sensitive to) an impact. The goal of the game is to maximize the number of successful catches in a row. (If there are multiple groups, the competition can be to see which group is better at catching the ball the most times in a row).
3. Participants gather in a circle (or several circles if there are more than about 16 people).
4. Participants count off from 1 to 4, and remember their numbers.
5. Toss the ball around the group randomly, for one round, until each participant has had at least one chance to catch or throw. The facilitator counts off the number of successful catches in a row, starting over at 1 each time someone drops the ball.



TIPS FOR TRAINERS

6. Once everyone has participated in a round, add in constraining factors, by adding rules such as:
 - a. A throw only counts if you throw and catch with your left hand;
 - b. People number 1 and number 2 are “don’t have access to piped water” and have to catch and throw with their eyes closed;
 - c. People number 3 are women who don’t have the same access to education and have to turn their backs to throw;
 - d. People number 4 are rich with access to great systems, insurance, etc. and can the drop the ball and it still counts;
 - e. Even number people are minorities who live in informal settlements with no land tenure and have to step back if the ball comes towards them, and odd numbers have to be sure to step forward and catch the ball.
7. If time allows, just before the last round of the game, increase the emphasis on competition, suggesting they can change how they incorporate or exclude those with constraints.

Discussion questions:

1. Review the game – was the game in any way similar to the “real world”? Discuss some examples.
2. What did people notice? What was easy? What was frustrating? What changed as constraints were added?
3. Is the best way to win leave out the people with constraints?
4. Is having a constraint a vulnerability? Does your sensitivity to your constraint depend on how the people around you interact with you?

* People with disabilities have suggested several possible modifications for those who cannot catch and throw a ball, including: place someone next to the person with a disability to catch the ball and drop it in their hand – a common strategy people come up with the deal with the handicaps of the game anyway; adjust the rules so everyone can participate meaningfully, such as relaxing the rules around throwing and catching; or think about how to create a “disability” group at the beginning of the game that similarly handicaps other participants or even puts your disabled participant at a relative advantage.

IDENTIFYING RESILIENCE OPPORTUNITIES

The goals of 'Identifying Resilience Opportunities' are to:

1. Identify whether ongoing disaster risk reduction, adaptation, development and resilience activities are truly helping build resilience.
2. Establish the range of resilience activities being conducted as a means to identify gaps in community and city-level resilience.

Building resilience requires a series of actions that involve diverse stakeholders and multiple sectors to improve systems and system access in ways that will improve people's wellbeing and livelihoods. Ideally, numerous adaptation, disaster risk reduction, development and resilience activities conducted by multiple different government and non-government organizations will be coordinated in ways that effectively contribute to building resilience. The 'Characteristics of Resilience' presented in the Making Resilience Tangible section of the Background Information can help determine whether or not activities are indeed resilience activities.



Tool: Resilience Action Across Scales

What is it, Why do it, What you get:

Building resilience requires being aware of what is going on at multiple scales (local, city-wide, regional, national) and acting at the scale that will have the most impact for what you are trying to do. In this activity, participants will identify current resilience building interventions related to the priority shocks and stresses chosen for this assessment. In considering interventions, participants will look at those occurring within communities, at the city scale, and at higher scales.

Time needed:

1 ½ hours

Materials needed:

- A large blank wall, a large sheet of paper posted on the wall (i.e. 2 or 3 pieces of flip-chart paper), or a large white-board or black-board
- Colored markers
- Large post-it notes, index cards or pieces of A4 paper in different colors
- Tape
- Shocks, Stresses and Systems maps from earlier activities

Steps:

1. Create a large scale vs. shocks and stresses chart on the wall, on a black- or white-board at the front of the room, or on sheets of flip-chart paper. National, City, and Local are written down the side and the prioritized shocks and stresses are written across the bottom, as shown in the example on the next page.
2. Participants, working individually or in groups of 2 or 3, write down projects, actions and policies that are currently being implemented to address the shocks and stresses shown on the chart.
 - a. Consider activities happening across all levels shown on the chart.

- b. Write activities on post-it notes, one activity per post-it.
 - c. Write down not just the action or policy but also who is doing it.
3. Stick each action or policy onto the chart above the shock or stress it addresses; post it at the level of action where it is being addressed, i.e., local-, city-, or national-level. More levels can be created if needed.
4. Note that multiple interventions can be listed at any level for any shock or stress. This is particularly important at the local-level, where there may be both multiple actions occurring in many places throughout the city, yet no action happening in response to most affected groups identified using the Understanding How Fragile Systems Affect People tool.
5. If participants have difficulty identifying interventions at any level, they should discuss how they could find out who would have information about what is happening. Write these questions and possible answers on a different colored sticky note or piece of paper and add them to the chart for the relevant shock or stress and at the appropriate scale.

FIGURE 8: EXAMPLE SCALE VS. SHOCKS AND STRESSES ACTIVITY DONE ON A WALL



6. When participants begin slowing down in posting actions, come together as a group. Review what actions and policies have been posted. Remove duplicate information and add in additional information that comes up during this process.
7. As a group, discuss the Discussion Questions below.
8. Save your Shocks and Stresses Across Scales chart so that you have it recorded for future reference (this could be saving it physically, making a clean copy on a piece of flipchart paper, or taking a photograph). Note any particularly interesting information, items that resulted in a lot of discussion, or questions that were identified for additional research.
9. Discuss as a group whether follow-up work is needed. If so, identify who will do it and when they will report back to the group.
10. As a group, fill out the table on **Resilience Assessment Worksheet 5**. This table poses 4 questions:
 - a. Where are organizations addressing fragile systems and the people affected by them?
 - b. What key actions are being taken at various levels, from local to national, that address these issues or populations?
 - c. Where in the city are fragile systems or the populations being affected by system failures not being addressed?
 - d. In addition to the city, are there other scales, from local to national, that should be involved in addressing the issues or locations in the box above?

Question **b** asks for more information about question **a**; question **d** asks for more information about question **c**. The goal of these questions **a** and **b** is to summarize the most important information on your Shocks and Stresses Across Scales. The goal of questions **c** and **d** is to summarize the most important gaps in information.

Discussion questions:

1. Do current actions address your prioritized shocks and stresses: At the national level? At the city level? In communities?
2. Where are local actions taking place? Are there parts of the city or key communities that are left out?
3. Are the vulnerable communities and fragile systems identified earlier being addressed?
4. Where can neighborhood-level efforts better support city-level resilience?

5. Where can city-scale efforts better support vulnerable communities?
6. Is there a way your resilience assessment can address these issues?

Further resources

Who can help you

- Humanitarian aid organizations
- Disaster management office
- Civil Society Organizations
- Community members

Publications with further information

- Annual reports/working papers from government and non-government entities working on disaster management, climate change adaptation, poverty reduction, and resilience



TIPS FOR TRAINERS

Preparatory Reading from the Background Information Section

- Planning for an Uncertain Future
- Making Resilience Tangible

Implementing the tool(s)

This section is about determining whether and if so where (both geographically and in terms of local to national scale) current actions are addressing the resilience challenge you have defined in the first three stages of your resilience assessment (i.e. resilience of what, to what, and for whom).

Almost any adaptation, mitigation, disaster risk reduction, disaster preparedness, or disaster response action or policy is building resilience. Most basic development and infrastructure projects and policies also build resilience. The goal here isn't to focus on what has happened as much as it is to look at the big picture of what is happening and what isn't happening. The gaps in action are as important for resilience as what is being done.

Gaps can include communities that are high risk and few or no groups are working there. They can be gaps in action across scales — i.e. there's donor funding and momentum around a certain type of community work, but there is a lack of city, state or national policy to support that action and makes it easier to leverage private or public funds. Or, gaps can reflect disconnects or inefficiencies between the work being done and the needs on the ground — for example communities where donor supported drainage projects are being overwhelmed by runoff that has intensified due to city road projects.

FUTURE SCENARIOS

Future scenarios are used in resilience assessments to help:

1. Determine how your city may change due to change processes like climate change and urbanization.
2. Identify how building resilience can alleviate some of the potential issues caused by change processes.

Uncertainty about how change processes will affect your communities and city makes it challenging to determine how to act today. Developing scenarios of how your city may change will allow you to begin identifying where and how you can act despite uncertainty.



Tool: Historical, Current and Future Profiles

What is it, Why do it, What you get:

In most places in the world, cities have changed dramatically over the past 20 to 30 years, and are anticipated to continue changing at similar rates for at least the next few decades. Changes in population, built environment, technology and economies have eliminated old livelihoods and created new ones. Building resilience for today and the future requires that we understand and anticipate these changes. We cannot successfully build resilience for the future by looking at the past.

However, beginning our look at the future by looking at the past and understanding the developments and trends that have brought us to today can help us develop scenarios of what the future may look like. In this activity, participants will gain an appreciation for how much the city and its communities have changed in the past 20 years and develop a sense of how current trends in urbanization and climate change could influence the future 20 years from now.

Time needed:

1 ½ to 2 hours

Materials needed:

- Flip-chart paper
- Colored markers
- Map of the city (optional; for reference only)
- Historic and current pictures of the city (optional; to help participants see the changes that have occurred)
- Any future climate forecast/assessment of the city

Steps:

1. Break into small groups of 5 to 8 participants.
2. Each group creates a large table on a sheet of flipchart paper like the table shown below.

FIVE CAPITALS	PAST (20 YEARS AGO)	TODAY	FUTURE (20 YEARS FROM NOW)
Human			
Social			
Physical			
Natural			
Financial			
Governance			

3. Think about the Past (20 minutes)

If historical pictures of the city are available, start by looking at a couple of old photos (no more than 5), from oldest to most recent. Pictures can be drawn from a broad range of topics – landscape images of the city, pictures of typical inhabitants, transportation, etc. In particular, include photos from about 20 years ago. If pictures are unavailable, begin with a group discussion of what the city was like about 20 years ago.

Discuss what life was like within each of the 5 Capitals – e.g. Human Capital: there was less access to health care and formal education, Social Capital: people were more connected, Physical Capital: there was less development in hazardous areas so vulnerability to coastal and riverine flooding was much lower, but droughts had significant impact on both farmers and poorer communities who couldn't afford to buy food, etc.

Fill this information into the table.

Next, discuss past shock or stress events and how they affected people and systems in the past. Add any additional detail to your table that comes up in this discussion.

4. Think about today (20 minutes)

Repeat the discussion, but focusing on today. How have things changed in the past 20 years within each of the 5 Capitals? Notice trends, and how fast or slow things are changing. These changes can be easy to forget if you are living in and are a part of the change. Fill this information into the table.

Discuss how the same shocks or stresses you discussed for the past would impact the city today. Would the impacts be bigger or smaller? Would the same people, locations and systems be impacted? Would new people, locations and systems be impacted? Are there completely new shocks and stresses that you are dealing with today that didn't exist in the past?

Note: steps 3 and 4 are basically a version of the VCA Historical Profile.

5. Future (20 minutes)

Discuss how the city has changed from the past to today. What is good about the changes, and what is bad?

Now, for each capital, discuss what conditions will be like twenty years from today given past trends and current conditions. Fill this information into the table.

Finally, discuss shocks and stresses today and how they might affect your city in the future. Will the impacts be bigger or smaller? What would have to happen between now and then to assure impacts are smaller? Will there be completely new shocks and stresses in the future that don't exist today? Who, what systems, and which locations could be impacted by those new shocks and stresses?

6. Come back together as a large group and discuss the Discussion Questions.

7. As you discuss Question 1, fill out column **a** on the table on **Resilience Assessment Worksheet 6**.

8. As you discuss Question 2, fill out column **b** on the table on **Resilience Assessment Worksheet 6**.

9. As you discuss Questions 3 through 5, fill out the table on **Resilience Assessment Worksheet 7**.

Discussion questions:

1. What are the biggest changes that have occurred over the past 20 years in each of the five capitals categories?

2. What changes could occur over the next 20 years based on past trends?
3. How could major shocks and stresses change between now and the future? Will there be new shocks or stresses in the future that are currently not experienced or happen now infrequently or at low intensity but you expect the frequency and/or intensity will probably increase?
4. Which people and what locations and systems will be exposed? Which people and what locations and systems will be sensitive and why will they be sensitive?
5. What actions could be started today to reduce that exposure or sensitivity?

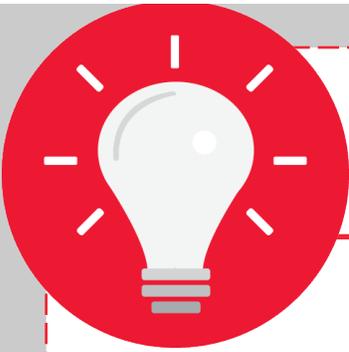
Further resources

Who can help you

- University researchers (e.g. climate change scientists, sociologists, and historians)
- Government planning offices
- Local historians
- Community leaders
- Local meteorology offices

Publications with further information

- City and/or national planning documents (e.g. 5 year or 10 year plans)
- Climate change projections
- Economic projections
- Migration and/or population growth projects
- Development plans
- International agreements and/or international politics that may significantly affect the economy, migration and/or development in your country.



TIPS FOR TRAINERS

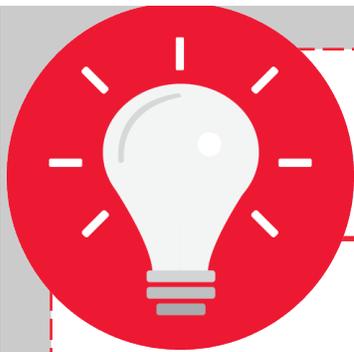
Preparatory Reading from the Background Information Section

- Planning for an Uncertain Future

Implementing the tool(s)

As with the mapping tools, it is possible to go into a lot of detail about the past, present and future with this tool. However, detail is not the point. What you want to accomplish with this tool is to allow participants to deeply feel and see how much the world has changed in the past 20 years, but without getting lost in the detail. For example:

- How much has the city grown in the past 20 years? Where did those people come from, and why?
- How has new technology changed both lives and the culture? Cell phones didn't exist 20 years ago, and now many people not only have cell phones but smart phones.
- Is traffic getting worse? How has transportation changed? How has this affected lives and livelihoods and commerce?
- How are health issues changing?
- How did people earn a livelihood 20 years ago, both in the city and in the country? How do they earn livelihoods now?
- How is the natural environment changing, both in the city and in the country? Even aside from climate change, what is different? Is there more deforestation? Is farm land becoming depleted? Are reefs and fisheries suffering?
- How have crime and conflict and poverty changed? Are the causes and victims the same?



TIPS FOR TRAINERS

Once participants have developed a deep sense of how much has changed and how quickly change is happening, then have them think about what the future may be like. For the future scenarios, be careful that people don't think just of the worst possible future or the best possible future. Instead, have them focus on where current trends could lead them. Think about trends in technology, economy and industry, migration and population, development, culture, and politics. If the city or country has 5, 10 or 20-year development plans, these can be used to help frame the future discussion.

Only after participants have explored where current trends can lead them do you want to discuss what the future **could** look like. This is important, since the goal is a more resilient future. However, you want it to be solidly grounded in where you are currently headed, so it's clear what needs to be done in order to get to a more ideal future.

In considering the future, both the future based on current trends and a more ideal, resilient future, remind participants that vulnerability is a dynamic between hazard, exposure and sensitivity and all three of these can change. The complexity of this discussion will depend on the capacity of the participants.

As the facilitator, you may wish to create large versions of Resilience Assessment Worksheets 6 and 7 (perhaps hand-drawn on flip chart paper) to post on the wall and fill in with participants during the Discussion Question discussions. If you do this, make sure to either save the wall version of these table for later use, or have participants or a scribe transfer the information to an A3 or 11"x17" version of the worksheets.

SETTING RESILIENCE PRIORITIES

In this section, you will conclude your resilience assessment by:

1. Reviewing all your previous work from your maps, saved materials and Resilience Assessment Worksheets.
2. Synthesizing the information and knowledge you have gained through the resilience assessment process.
3. Beginning to identify gaps and opportunities for building resilience.

Throughout this methodology, you have identified core urban systems, determined which systems are vulnerable to key shocks and stresses, identified how specific groups of people and communities are impacted by disruptions to core urban systems, and explored how resilience can help people cope with disruptions and improve systems and access to systems/services both now and for the future. Now, all that information and knowledge you have gained needs to be synthesized to determine key resilience priorities, and how those priorities can be met through your coalitions.



Tool: Road Map for Building Resilience

What is it, Why do it, What you get:

In this final session, participants review the insights and conclusions developed using all the previous assessment tools and identify next steps. Participants may have understood and completed every exercise in the Resilience Assessment, but remembering the results from each activity and knowing how to combine them to decide on what actions to take can be difficult. Using a simple table, this exercise brings the main ideas and concerns identified in the various toolkit activities together in one place to make it easier to see how to move forward.

This exercise assumes that participants can agree on general directions to move forward. It is unlikely that participants will develop specific projects in this session, but they can identify key areas that they should focus on. For example, participants may see that addressing the housing needs of migrants, or the health care needs of children under five, is a priority for building resilience. The specific projects to do that can be designed as a next step with interested members, drawing in people and resources from outside the assessment.

Time needed:

2 hours

Materials needed:

- Resilience Assessment Worksheet packets
- Systems, Shocks and Stresses maps
- Any other saved materials from prior tools
- Paper and pens
- A sheet of flipchart paper for each group of 5 to 8 participants
- Colored markers
- Tape

Steps:

1. Participants take a few minutes to review the **Resilience Assessment Worksheets** and other key materials developed or collected while working through this toolkit.
2. Participants break into small groups of 5 to 8 people. Each group draws a copy of the table shown on the next page on a sheet of flipchart paper.
3. Working in small groups, participants fill out their tables:
 - a. Go back to the beginning of your resilience assessment process and review the conclusions of each exercise. If you have been using the **Resilience Assessment Worksheets**, this information should be summarized on the worksheets and in the maps you saved. For example, in Mapping Systems, participants wrote down which systems they agreed were a priority and then mapped those systems.
 - b. Fill in the worksheet chart all the way across until you have recommended actions and key partners identified. Brainstorm as a small group what actions you would recommend and who would be key partners for those actions. Keep in mind the resilience characteristics listed in the Background Information. Which characteristics do your proposed actions build? Recommended actions do not have to be specific projects; they just need to identify general actions to take to deal with the issues that have been identified. Project details should probably not be explored until the key partners are engaged.
4. When all the small groups are satisfied that they have identified the major issues, come back together as a large group.
5. As a large group, discuss the Discussion Questions below. The facilitator may want to create a new copy of the table to summarize findings there.
6. If participants want, they can transfer the results of their flipchart tables to **Resilience Assessment Worksheet 8** so that they retain a copy of the final analysis along with results from the prior tools.

Priority shocks and stresses	Core Systems Affected	Key Stakeholders Affected	Gaps in current resilience actions	Initial Ideas for Resilience Actions	Key Partners

Discussion Questions:

1. Did participants identify similar resilience actions? If not, why not? The differences can be helpful for developing effective programs.
2. Have you identified groups or individuals as key partners who have not been part of the assessment process to date? If so, how can you approach them to get them involved?
3. Are your resilience actions in the form of projects, or more general concerns that you must address? What is the next step to turn them into real projects?

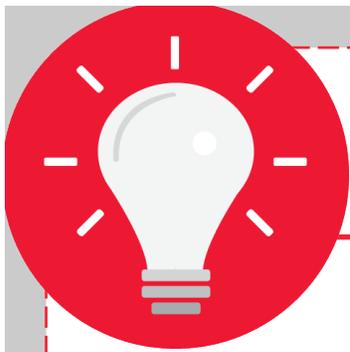
Further resources

Who can help you

Often you will find that you need people with more specialized knowledge to figure out exactly what you should do. You may need to seek out these people to finish up your understanding of what action to take. These people may be in government departments with specific technical knowledge, or in the private sector from consulting firms, construction companies, marketing firms, etc. Or they may be civil society organizations, community groups, or university staff who have important perspectives on the issue.

Publications with further information

100 Resilient Cities Resilience Strategies — these documents, now available for multiple cities around the globe, provide a range of different resilience activities prioritized by the cities. Though these are primarily municipal-government focused, they nonetheless provide a broad overview of possible resilience actions, and clearly identify actions that city governments might be interested in partnering to implement.



TIPS FOR TRAINERS

Preparatory Reading from the Background Information Section

- Making Resilience Tangible

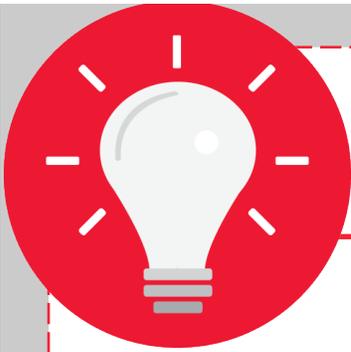
Implementing the tool(s)

Throughout the workshop or assessment process, participants will generate conclusions in each exercise and activity. However, these conclusions are often not integrated with conclusions from prior activities, because of lack of time or simply because how the activities are connected isn't clear. As a result, integrating the conclusions from individual activities together to figure out what to do in the future can be hard. Encourage people to take sufficient time to review the conclusions from the individual tools and think about how they fit together into a big picture before they start proposing solutions.

Some people do better thinking through confusing things like this by reviewing their notes on their own, without much discussion. To encourage this thoughtful review, suggest that participants work on their own for a while before they come together in small groups to compare results.

Once people have had a chance to review and reflect on their own, bring them together in small groups to compare notes. The opportunity to work together will help generate further synthesis and insights. However, make sure to work in small groups, not as one large group. This will encourage everyone to engage, not just those who are most outspoken. Keep in mind that since no one is an expert on everything, discussion in small groups will often produce better solutions than what individuals can come up with on their own.

Before concluding this final activity, have participants discuss and make commitments for what they will do next to begin acting on the results of the resilience assessment. An assessment is only useful if it leads to action.



TIPS FOR TRAINERS

If these tools are being introduced in a three-day workshop, have participants focus on what steps they need to take to begin their resilience assessment and who will play what roles rather than on filling out the final **Worksheet**. They will not have gone into enough depth with the tools, nor had the opportunity to look for missing information and players, to have a clear picture about what actions need to be taken to build resilience. They will, however, have a much clearer picture of what their assessment process needs to look like and who should be involved. Before concluding this final activity, have people make commitments for what they will do over the next 2-4 months to actually conduct a resilience assessment.