

# 2.1.0

**SERIES 2**  
Understanding  
Vulnerability & Risk



## Contents of Set

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# DEFINING VULNERABILITY & RISK

You were just introduced to the concepts of vulnerability and risk assessments, what role they play in city resilience building, and how they were applied in various ACCCRN contexts in Series 2.0: Overview. In this set we present a short overview of some of the commonly used definitions of vulnerability and risk and ask you to select or develop a set of definitions that you will use throughout the rest of your resilience planning.

There are many definitions of vulnerability and risk in use in both the climate adaptation literature and in practice. It is important that everyone involved in the resilience planning process is using the same definition for the following reasons:

- You will have a lot less confusion among stakeholders in the process if you have a shared definition of vulnerability and risk upon which everyone agrees.

- Your definitions can help guide your approach to how you conduct your vulnerability and risk assessments, the methods you use, and your overall vulnerability and risk framework (discussed in the Set 2.2).
- Your definitions are clear and understandable to policy makers and can be used in your city's planning processes.

### IN THIS SET YOU WILL:

- ✓ Work with your team to develop shared definitions of vulnerability and risk that you can refer back to throughout your resilience planning process.

## Common Definitions: Vulnerability & Risk

There are many definitions of vulnerability and risk, each arising from a different perspective —disaster risk reduction, sustainable development, poverty alleviation, and climate science, to name a few. The disaster risk reduction definitions keep vulnerability and risk separate (UNDP 2005):

- Vulnerability is a measure of human welfare that integrates environmental, social, economic and political exposure to a range of harmful perturbations.
- Risk is the likelihood of a climate hazard event and/or its consequences (impacts) to a particular system or agent as a result of that system's or agent's vulnerability.

### DEFINITIONS OF SYSTEMS AND AGENTS

SYSTEMS in a city include infrastructure, services, and functions (e.g. water supply and wastewater treatment systems, roads, power lines, food distribution, health, education, finance) and ecosystems (e.g. agricultural land, parks, wetlands, fishing grounds). Systems are designed and managed by people, but their performance depends on a multitude of factors that are difficult to manage, including human behavior and institutional context, which often lead to unintended side effects like pollution. Systems are fragile if they are easily disrupted or broken, though their basic functioning may look very stable.

Systems are linked and dependent on each other. The strengths or weakness of the links between systems can enhance adaptive capacity or increase the

vulnerability of other systems. A system's climate risk depends on how likely a particular climate hazard is and what its consequences might be as a result of that system's vulnerability.

AGENTS are individuals, households, communities, the private sector, businesses, and government entities – they are people functioning either alone or in groups. People, unlike systems, are capable of careful thought, independent analysis, voluntary interaction, and strategic choice in the face of new information. This makes agent behavior more difficult to predict than system behavior. People's thinking, analysis, interaction and choice often reflects their location and structure within society, their preferences, and the opportunities and constraints they perceive.

The Intergovernmental Panel on Climate Change (IPCC) definition of vulnerability is widely referred to in climate adaptation and resilience programs, but doesn't define risk because it includes likelihood in the definitions of exposure and sensitivity.

- Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2001: 388).

In this set, we have chosen an approach and associated definitions that keep vulnerability and risk separate. We find this often makes it easier to understand the underlying causes of vulnerability for your city, to create scenarios of potential future impacts and the consequent risks, and to identify different resilience options. We also find that using very simple definitions makes the work easier. These definitions, for all that they are simple, are equally technically rigorous and are supported by a strong conceptual framework.

*Vulnerability: Who/what (e.g. individuals, neighborhoods, businesses, livelihoods) might suffer harm because of what (e.g. extreme climate event, indirect event like landslide, slow-onset change) and why (e.g. low education, live in poorly constructed housing, no access to health clinics).*

*Risk: The likelihood (how frequently a climate hazard might occur in the future due to climate change) that who/what might suffer harm because of what and why.*

#### **IN THIS DEFINITION, EXPOSURE, SENSITIVITY AND ADAPTIVE CAPACITY ARE DEFINED AS:**

**Exposure:** The nature and degree to which a system experiences climate events, such as temperature increases, rainfall variability and change (including extremes), or changes in the frequency or intensity of tropical cyclones and storms.

**Sensitivity:** The degree to which a system is affected, either adversely or beneficially, by climate-related stimuli. It is often measured by the system's response to what has happened during past events.

**Adaptive Capacity:** The ability of a system to adjust to climate—including climate variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

In the end, it doesn't matter which definition of vulnerability and risk that you use. It is simply important that everyone involved in the resilience process agrees on the same working definition to avoid confusion throughout the process. As with every step of the resilience process, it is likely that you will return to your definitions and ask yourself if they are still relevant to what you are finding in the process or if they need to be modified.