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Monitoring and Evaluating Climate Adaptation Activities

A Reference Guide for City Managers



AUGUST 2019

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Prepared for:
United States Agency for International Development
Adaptation Thought Leadership and Assessments (ATLAS)

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CONTENTS

ACRONYMS.....	v
GLOSSARY OF TERMS.....	vi
HOW TO USE THIS GUIDE	1
INTRODUCTION.....	2
Objective of Climate Adaptation M&E.....	2
Foundational Elements of Adaptation M&E.....	2
ADAPTATION M&E FRAMEWORK COMPONENTS	4
Define Purpose of M&E Framework	4
Establish an Approach	7
Define an Institutional Structure	12
Select Indicators.....	15
Establish a Data Collection, Storage and Use Plan.....	19
Design a Reporting Structure	23
Define Evaluation	26
Create Opportunities for Learning and Development.....	28
ANNEX A: INDICATOR REFERENCE SHEET TEMPLATE WITH INSTRUCTIONS AND EXAMPLE.....	33
ANNEX B: INDICATOR EXAMPLES	36
ANNEX C: LIST OF ALL RESOURCES BY M&E COMPONENT	38

ACRONYMS

CVA	Climate Vulnerability Assessment
DFID	Department for International Development
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
PIRS	Performance Indicator Reference Sheet

GLOSSARY OF TERMS

Below are definitions for terms used in this guide. The definitions reflect USAID terminology where possible, and otherwise use commonly accepted definitions.

ACTION—A policy, program or infrastructure project.

ADAPTATION—“The process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.” (IPCC, 2012, p. 582). “Adaptation actions seek to enhance resilience and reduce climate vulnerability in the near- and long-term by decreasing exposure or sensitivity, or by increasing adaptive capacity.” (USAID, 2015).

CITY MANAGER—Cities have differing organizational structures based on their country context. This guide uses “city managers” as a general term for any city staff in charge of leading the development and implementation of a city-wide adaptation M&E framework. Often the lead is a department head or multiple department heads along with relevant staff.

RESILIENCE—“The ability of people, households, communities, countries and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.” (USAID, 2012).

MONITORING AND EVALUATION TERMS

BASELINE—The value of an indicator before major implementation actions of strategies, projects or activities. Baseline data enable the tracking of changes that occurred during the project or the activity with the resources allocated to that project or activity (USAID, 2018b, p. 117).

DYNAMIC BASELINE—Adjustment of baseline data collected at the start of the project where conditions have substantially changed (particularly climate factors and their consequences) to maintain the relevance of the benchmark (Olivier et al., 2013, p. 32).

EVALUATION—The systematic collection and analysis of information about the characteristics and outcomes of strategies, projects and activities conducted as a basis for judgments to improve effectiveness and timed to inform decisions about current and future programming (USAID PPL, 2017, p. 5).

IMPACT—The anticipated end results or long-term effects of a program (Frankel and Gage, 2007, p. 75).

IMPACT EVALUATION—Evaluation based on models of cause and effect and that requires a credible and rigorously defined counterfactual to control for factors other than the intervention that might account for the observed change. Impact evaluations in which comparisons are made between beneficiaries that are randomly assigned to either a treatment or a control group provide the strongest evidence of a relationship between the intervention under study and the outcome measured. Impact evaluations measure the change in a development outcome that is attributable to a defined intervention (USAID, 2018b, p. 147).

INDICATORS—Quantitative or qualitative measures of program performance that are used to demonstrate change and that detail the extent to which program results are being or have been achieved. Indicators can be measured at each level: input, process, output, outcome, and impact (Frankel and Gage, 2007, p. 76). Indicators measure characteristics or conditions of people, institutions, systems, or processes that may change over time (USAID, 2018b, p. 148).

INPUTS—The human and financial resources, physical equipment, clinical guidelines, and operational policies that are the core ingredients of programs and enable programs to be delivered (Frankel and Gage, 2007, p. 76).

LOGIC MODEL—A program design, management, and evaluation tool that describes the main elements of a program and how these elements work together to reach a particular goal. The basic elements in describing the implementation of a program and its effects are: inputs, activities or processes, outputs, outcomes, and impacts. A logic model graphically presents the logical progression and relationship of these elements (Frankel and Gage, 2007, p. 76). A logic model visually depicts the theory of change, illustrating the connection between activities and expected outcome (USAID, 2018b, p. 149).

MONITORING—Tracking progress toward planned results defined in the logic model. Monitoring can include both performance and context monitoring (USAID PPL, 2017, p. 2).

OUTCOMES—The changes measured at the population level in the program's target population, some or all of which may be the result of a given program or intervention. Outcomes refer to specific knowledge, behaviors, or practices on the part of the intended audience that are clearly related to the program, can reasonably be expected to change over the short-to-intermediate term, and that contribute to a program's desired long-term goals (Frankel & Gage, 2007, p. 77).

OUTPUTS—The results of activities achieved at the program level, in two forms: the number of activities performed and measures of service utilization (Frankel and Gage, 2007, p. 77). Outputs are what are produced as a direct result of inputs. They are the tangible, immediate, and intended products or consequences of an activity (USAID, 2018b, p. 152).

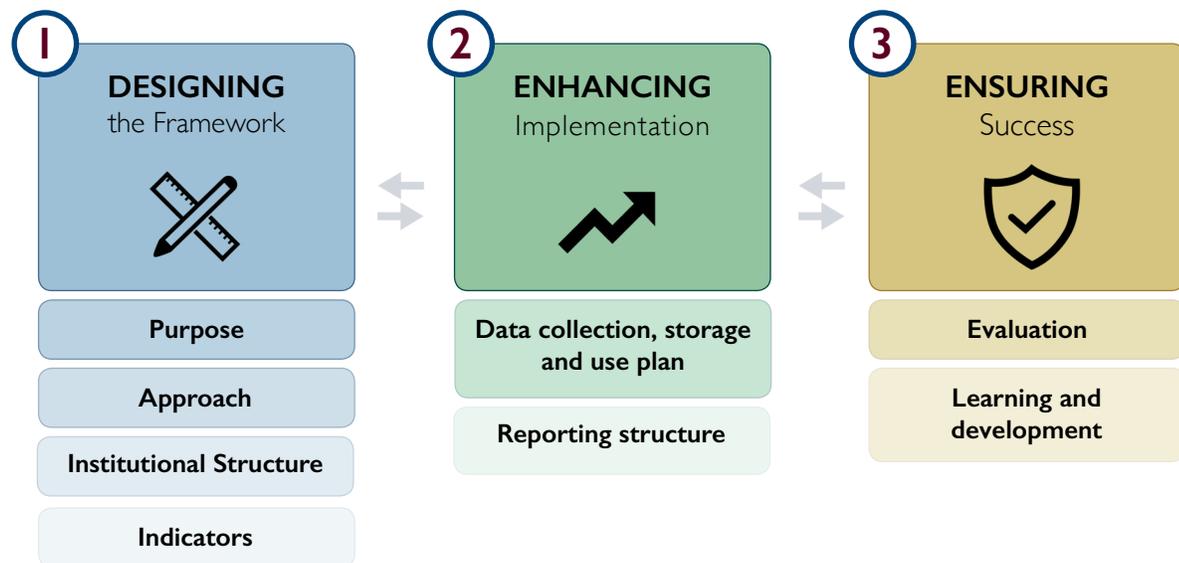
PERFORMANCE TARGET—The specific, planned level of result to be achieved within an explicit timeframe with a given level of resources (USAID, 2015).

RESULTS FRAMEWORK—A logical summary that explains how a project's strategic objective (SO) is to be achieved, including those results that are necessary and sufficient, as well as their causal relationships and underlying assumption (Frankel and Gage, 2007, p. 79).

THEORY OF CHANGE—A process that describes how a particular intervention will bring about results. The process identifies a long-term goal and provides a backward mapping of the conditions necessary to meet that goal (Brown, 2016). The result is a narrative description, usually accompanied by a graphic or visual depiction, of how and why a purpose or result is expected to be achieved in a particular context (USAID, 2018b, p. 158).

HOW TO USE THIS GUIDE

This reference guide is for city managers and other city staff who are creating a **citywide climate adaptation monitoring and evaluation (M&E) program**. The guide details essential components of an adaptation M&E framework and provides a structure for cities to plan and implement an adaptation M&E framework.



Each section is organized into the following sub-sections:

- **Key recommendations:** a summary of essential recommendations
- **Guidance:** in-depth context and explanation of key recommendations
- **Best practice:** best practices pulled from references and case studies
- **Resource:** M&E tools and publications that go into more detail on the component

This should not be considered a sequential step-by-step guide; components need to be planned for and developed in parallel, as many are interdependent.

This guide complements USAID's [Resilience Measurement Practical Guidance Note series](#), USAID's [Best Practices in Monitoring and Evaluation of Urban Climate Adaptation](#) (2019) and other USAID monitoring, evaluation and learning (MEL) guidance and templates. Some of the examples, links and resources focus more broadly on resilience measurement, not specifically on climate adaptation, as the adaptation measurement field is less well developed. In addition, non-urban donor tools and examples were included where applicable due to a limited number of urban-focused tools and examples.

INTRODUCTION

OBJECTIVE OF CLIMATE ADAPTATION M&E

Climate adaptation initiatives are increasing at both the international and national level. At the local level, cities are leading the way, committing to ambitious climate adaptation goals through global city networks or groups. These public commitments are driving action in cities. For example, Rotterdam has committed to being “100 percent climate proof by 2025”, reflecting the need for the city to be resilient to frequent and rapidly worsening flooding to which climate variability and change are contributing. Bold commitments like these will require robust monitoring and reporting to measure achievement, document outcomes and learn from their adaptation activities. Cities committed to adaptation action face a tough challenge documenting changes in resilience of urban systems and populations. Mitigation can be measured by tracking greenhouse gas (GHG) emissions, but measuring the impact of adaptation actions is less straightforward.

Adaptation monitoring and evaluation (and importantly, learning) of activities can help cities move beyond city- and project-level progress reporting. Adaptation to climate change is influenced by other interconnected development factors, such as socioeconomic trends, urban services, city infrastructure, social support networks and financial systems. Tracking the effect of specific adaptation actions—such as building green infrastructure to slow storm water runoff, installing early warning systems for hazards, or constructing cooling centers for heat waves—requires a strong climate adaptation M&E framework. A strong adaptation M&E framework will allow city managers to evaluate the effectiveness of their actions and ensure limited funds are being spent effectively and efficiently. A strong framework can also serve as a management tool, providing regular feedback for adjustments to adaptation action design, planning and implementation.

Foundational Elements of Adaptation M&E

This guide assumes that a city has made significant progress in adaptation planning and implementation, including:

-  The city has completed a **climate vulnerability assessment (CVA)** or risk assessment (and therefore has an evidence baseline of climate risks).
-  The city has completed an **adaptation plan** (or climate action plan with adaptation components), including the prioritization and selection of specific adaptation actions to implement.
-  The city has conducted or will conduct an **assessment of its M&E capacity**.

Foundational Elements of Adaptation M&E (cont'd.)

CLIMATE VULNERABILITY ASSESSMENT (CVA)

A CVA will build the foundation of data and knowledge on development and risk context that is needed to plan adaptation actions. The CVA may also be useful for setting a baseline for indicators. There are numerous resources that can help cities plan and inform urban adaptation assessment or resilience measurement, including the following resources produced by USAID:

- [Climate Vulnerability Assessment: An Annex to the USAID Climate-Resilient Development Framework](#)
- [Designing Climate Vulnerability Assessments](#)
- [Resilience Measurement Practical Guidance](#)
- [Urban Resilience Measurement: An Approach Guide and Training Curriculum](#)

ADAPTATION PLAN

An adaptation plan is key to developing policies, programs and projects that will improve resilience and reduce risk for a city. Adaptation planning and the resulting action plan foster a shared vision among city stakeholders, resilience goals and an understanding of the process for achieving their goals. Practically, an adaptation plan provides a structure for an adaptation M&E framework or plan.

M&E CAPACITY ASSESSMENT

A city should hire a specialist consultant with technical expertise in monitoring and evaluation of programs in the urban context to assess the capacity of relevant city agencies and partners to undertake the rigorous work of adaptation M&E, specifically around data collection and reporting. At a minimum, the assessment should include knowledge of general M&E concepts among agency staff and partners, financial and human resources, information management systems and data audit capabilities. This assumes that the city already conducts M&E in other areas, and has a policy or legal mandate in place that governs M&E.

ADAPTATION M&E FRAMEWORK COMPONENTS



Define Purpose of M&E Framework

KEY RECOMMENDATIONS

- **Clearly lay out the goals and outputs** of the climate adaptation M&E framework early in the development process. For example, if the sole purpose is to report on actions in the adaptation plan, this will guide decisions on other framework components.
- **Establish the purpose of M&E together with key stakeholders**, ideally involving all stakeholders in early consultations on the purpose and approach of the climate adaptation M&E framework.

GUIDANCE

Developing an adaptation M&E framework requires a significant commitment of time and resources. Therefore, defining the purpose of the framework early will allow for an efficient development process that conserves time, labor and resources and ensures that the framework serves the adaptation goals of the city. Having completed the foundational elements mentioned above (CVA, adaptation planning, M&E capacity assessment), city managers should be clear on the adaptation outcomes desired and the city's capacity and resource limitations that affect their achievement. Using that information, stakeholders can support the government in defining the purpose of adaptation M&E.

City context greatly influences the reason for developing adaptation M&E. For example, consider two cities, both prone to flooding from rivers, with adaptation goals to build resilience to this risk. One city has robust data, but lacks access to financing from city tax revenues for necessary adaptation measures and relies on external funding to meet its goals. The other has access to sufficient public financing, but lacks sufficient data for reporting. As a condition of receiving external funding, donor agencies would require the first city to monitor, measure and report on a reduction of climate risk to validate the contribution of donor-funded projects. This would be the explicit purpose for developing an adaptation M&E framework for that city. Alternatively, for a city that lacks capacity to collect data to track outcome indicators, the initial

Common Reasons Cities Develop Adaptation M&E Frameworks

- **Required reporting** on published climate action plans, and/or external commitments to climate action
- **Required monitoring** and reporting on donor-funded activities
- **Managing risk** of climate change impacts for cities that are impacted frequently
- **Accessing alternative means of financing** for climate actions, thus requiring a certain level of monitoring and reporting rigor
- **Learning** from action implementation to improve future design
- **Monitoring** of the increase or decrease in climate risk for insurance purposes

EXAMPLE: Monitoring the Rotterdam Adaptation Strategy

Ninety percent of Rotterdam is below sea level, and flooding is a frequent threat. To counter this threat, Rotterdam set the goal of being “100 percent climate-proof” by 2025 in the Rotterdam Adaptation Strategy. The city developed an M&E framework which is tied to the adaptation strategy and monitors each hazard type across five dimensions (risks, targets, effort, effect of implemented projects, and speed) and at multiple scales (citywide, district level, project level, or across projects). This framework structure allows city officials to closely track response and resilience to each hazard, and learn from and build on successful activities.

purpose of an adaptation M&E framework may be to report on the progress of implementation of the adaptation plan and provide transparency to the public on tax revenue expenditures. These differences in purpose will change the design, function and output of their respective frameworks.

Establishing a clear purpose will inform the choice of approach to adaptation M&E, dictating institutional governance, data collected, and indicators selected.

BEST PRACTICE

Climate adaptation provides city governments an opportunity to build cross-sectoral plans that pull in resources from numerous agencies or departments. In fact, cooperation and coordination across municipal departments is the only way that a complex threat such as climate change can effectively be addressed by a city. Regulatory or policy drivers that establish a legal framework for climate action, and monitoring and reporting on climate action can ease implementation of cross-sectoral adaptation M&E. Establishing climate change regulation or laws can orient agencies toward a shared purpose and encourage or compel data sharing for the sake of compliance. Some cities have laws that require an assessment of risk or a progress report on climate action plans every two years. Laws establish climate change action as a citywide priority and communicate the value of this action to all agencies and stakeholders.

City context shifts rapidly, and city managers should revisit the purpose of their adaptation M&E annually or every few years. As climate risks shift, the reason to monitor adaptation actions may evolve as well, and as the capacity of the city is strengthened over time, city managers can scale up the complexity of the approach. Starting simple and expanding as capacity grows is encouraged, and this may shift

purpose. For example, New York City established a simple progress reporting platform in 2015 for the public to track implementation of adaptation actions laid out in the city climate action plan, as they were working on creating more robust indicators to report on outcomes. The platform provided transparency and captured the essential output indicators (tax dollars spent, implementation progress) needed to demonstrate the city was effectively responding to climate risks, particularly in the aftermath of Hurricane Sandy¹. Following this, in 2019 the city produced a report that provided a framework for scaling up their M&E framework to track resilience outcome indicators (Blake, et al., 2019).

Resources

GIZ 2017. [The Adaptation M&E Navigator: Match specific M&E purpose to specific approaches](#)—A quick reference chart that provides a list of possible M&E purposes, and links those purposes with M&E approaches. Also provides basic guidance on output type, complexity, subjectivity and required experience of each approach type.

Price-Kelly et al., 2015. [Developing national adaptation monitoring and evaluation systems: A guidebook](#) (p. 24)—Chapter 1 provides context for city managers to consider how their citywide adaptation M&E fits into the greater policy context at the regional and national level, and provides guidance on how to vertically align adaptation policy starting from the local level.

Dazé, A., Price-Kelly, H. and Rass, N., 2016. "[Vertical Integration in National Adaptation Plan \(NAP\) Processes: A guidance note for linking national and sub-national adaptation processes](#)". This resource from the NAP Global Network provides advice for linking adaptation plans at the national and sub-national scale.

¹ Hurricane Sandy hit the New York region in 2012 and impacted the city with hazardous storm-surge and flooding. <https://www1.nyc.gov/site/orr/challenges/challenges.page>



Establish an Approach

KEY RECOMMENDATIONS

- City managers should **consider an approach that begins as a simple structure, and scales up over time**. Cities can start by assessing existing systems of data collection, M&E and reporting and use these existing systems for monitoring and reporting of related indicators for adaptation actions in the initial phase while moving toward a results-based framework.
- Cities can **build towards a results-based approach**, considered to be the most robust M&E approach available. Creating a framework for adaptation M&E that identifies input, outputs, intermediate outcomes and long-term impacts is iterative and evolving, not static.
- **Detail the necessary inputs to the system early in the adaptation planning process**, providing detailed projections for resources and naming key stakeholders, including all levels of local and national government.

GUIDANCE

City managers should seek out iterative approaches that align with their capacity but can also be scaled up, refined and expanded as actions are carried out. For example, cities can begin by tracking basic output indicators for adaptation actions. This system can then be scaled up over time to begin tracking outcome indicators (for examples of output and outcome indicators see Annex B) over time. M&E literature and experiences have shown that a results-based approach is best practice in adaptation M&E and can meet the needs of most cities. Results-based frameworks move beyond tracking implementation progress, inputs and outputs, to measuring outcomes and impacts. They provide a structure for using knowledge gained from monitoring to test assumptions underlying the results framework, encouraging iterative improvements in adaptation programs (Olivier et al., 2013). This section will provide guidance on that approach, but also reflect on other more limited approaches with which city managers can begin.

Key Components of a Results Based Framework for M&E

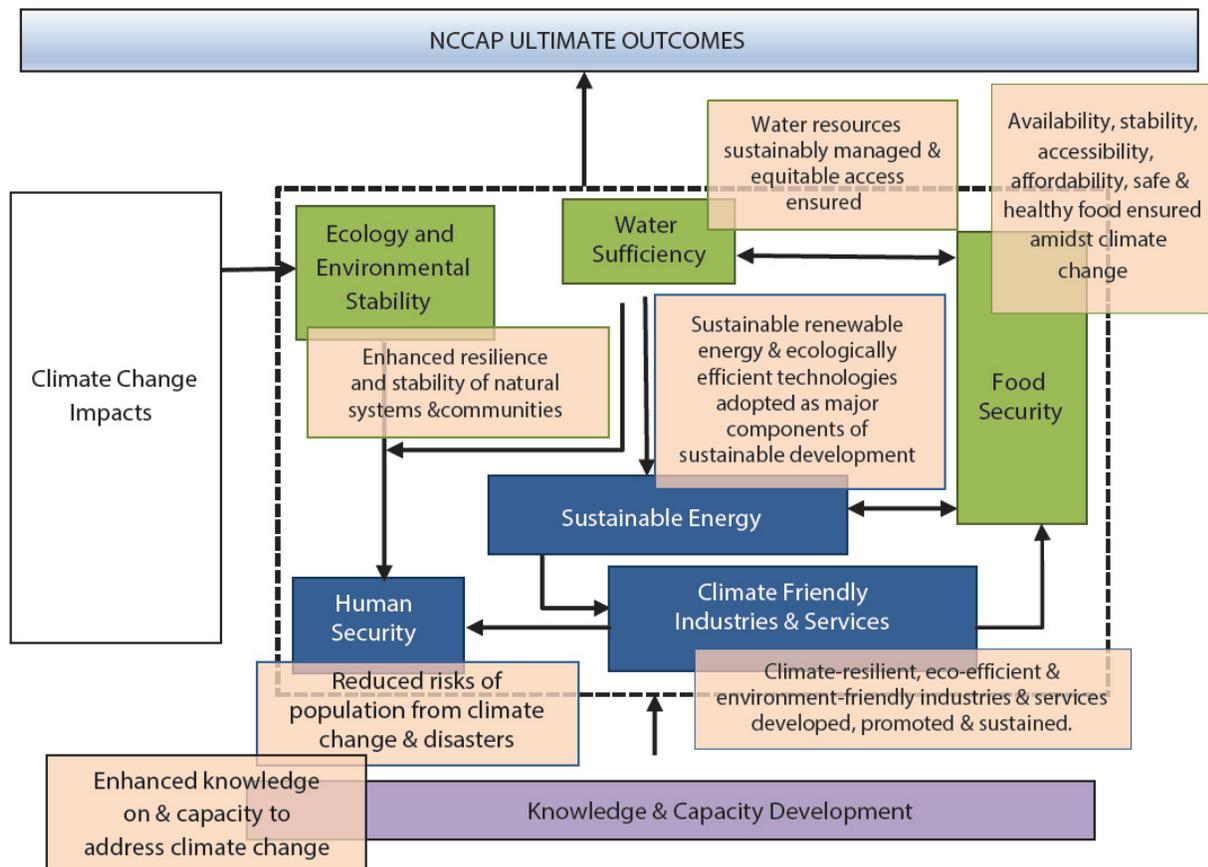
The World Bank defines results-based framework as “**representing the underlying logic that explains how an objective of a project is achieved**”. The framework translates the results chain into indicators that measure the degree to which inputs are transformed into outputs and achieve the outcomes and long-term impacts intended (The World Bank, 2013).

The framework includes the following:

- **Theory of change**
- **Project development objective**
- **Identified inputs, outputs, outcomes and long-term impact**
- **Performance indicators**
- **Reporting**
- **Evaluation and learning**

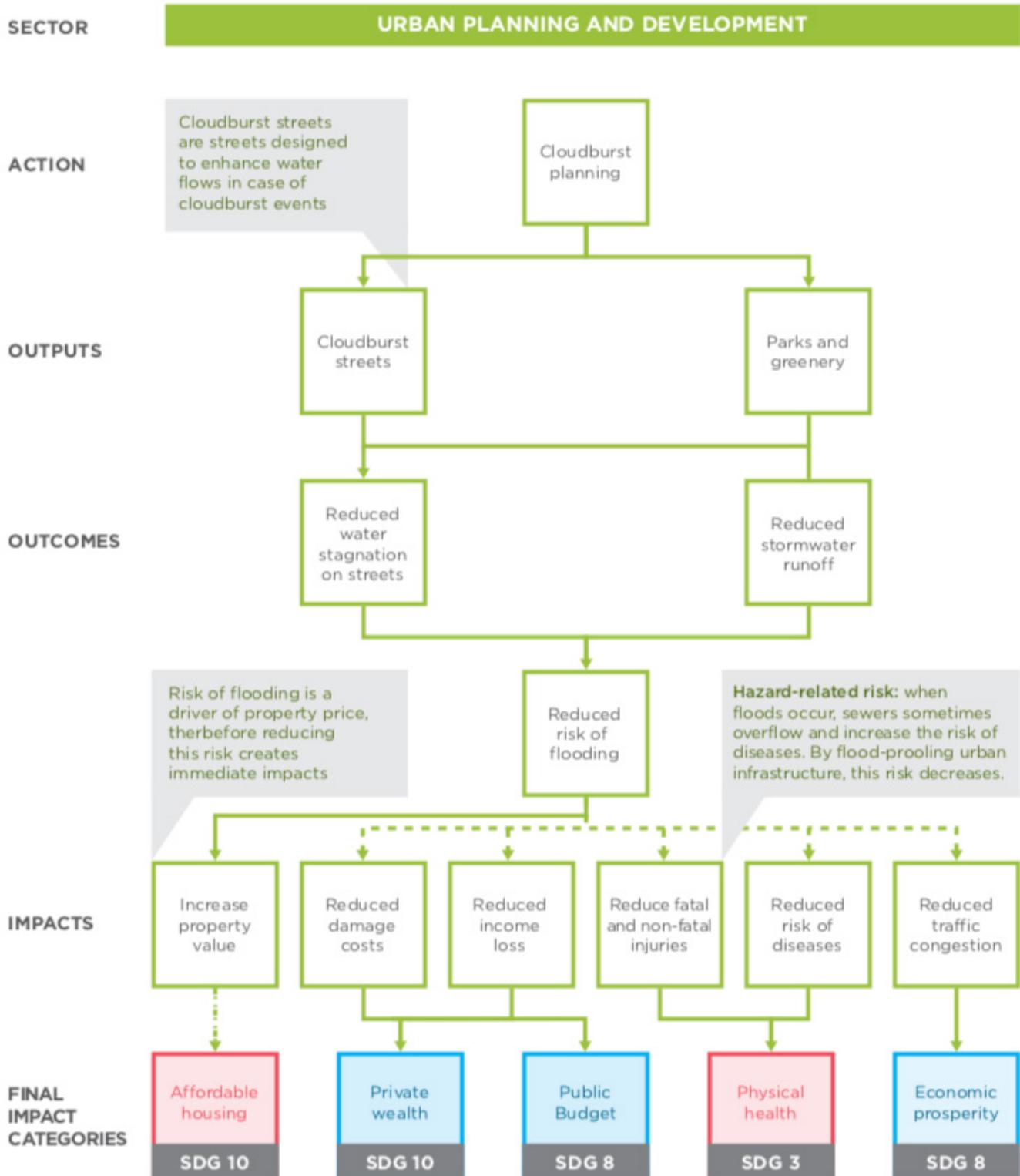
A results-based framework starts with a theory of change and identifies the input, outputs, intermediate outcomes and long-term impacts of a city's adaptation actions. City managers should have developed a theory of change during their risk assessment or adaptation planning process, but if not, should take the time now to create one. The most effective climate adaptation strategy (and related adaptation M&E framework) will flow from a rigorous examination of climate risks through a designated study such as a climate vulnerability assessment. For additional guidance, see resources for theory of change development at the bottom of this section, and example theories of change in Figures 1 and 2.

Figure 1. Philippines National Climate Change Action Plan Results Based Monitoring and Evaluation System Theory of Change



Source: Government of Philippines, 2015

Figure 2. Cloudburst planning theory of change



Source: C40, 2018

DESIGN FRAMEWORK
 ENHANCE IMPLEMENTATION
 ENSURE SUCCESS
 RESOURCES

Theory of change mapping starts with defining a long-term objective (e.g. improved human health and well-being) which is the highest development goal in the program, then works backwards to identify intermediate outcomes and outputs, and inputs that explicitly recognize the climate risks identified through rigorous climate vulnerability assessment (USAID Design and Planning for Resilience M&E). The theory of change should guide development of the activities and interventions identified in a city adaptation plan to respond to the risks identified in the climate vulnerability assessment, meaning the actions should contribute to achieving the desired intermediate outcomes and long-term impacts (see “Definitions” above for more detail on the terms included in this section). Theories of change test the assumptions and logic leaps made in adaptation planning and help elucidate the complex ties between development outcomes and adaptation outcomes.

Seeing the causal linkages and understanding all the components of city action will help identify the approach that should be taken. This theory of change and logic frame will feed directly into the indicator development process; therefore, city managers should invest the time and resources to establish a sound approach.

During the process of identifying and codifying an approach to adaptation M&E, city managers should define what resources will be needed. Human, financial and data resources should be detailed to provide a sense of the scope of work. To support this, city managers should conduct a mapping process for identifying key stakeholders; see box to the right for more details. Key stakeholders should be engaged early, so they understand their role in the M&E approach. Ideally all stakeholders will participate in the theory of change and results framework development process, providing a diversity of perspectives on the issues that impact a

Resource Mapping Process Questions

A mapping process can start by asking government staff with ownership of adaptation actions or policy the following questions:

- Which disciplines** are most involved in climate adaptation in the city?
- What **type of influence** do the stakeholders have in the climate adaptation process?
- Who are the **key parties** needed to plan or implement adaptation actions?
- Whose **interests and views** should be given priority?
- Who has **scientific expertise** to support key areas of climate adaptation?
- What **gaps in data** or knowledge on adaptation need to be filled and who could support this?

Stakeholders to Consult

- **Relevant local legislators** (e.g. members of the city council), including chairs of committees on planning, environment, infrastructure, etc.
- **Relevant departments within city government.** Typical examples include: Planning department, Environment and Natural Resources department, Department of Public Works or Engineering, Housing department, Disaster Management department and Agriculture department.
- **Local community groups** representing neighborhood interests and community needs, marginalized groups or vulnerable groups (e.g. women, elderly, young, indigenous).
- **Universities** and other academic institutions.
- **Private sector** businesses.

city's ability to adapt to climate change. Establishing this stakeholder group during approach design will build capacity and produce a cohesiveness that will enhance implementation of the M&E framework.

BEST PRACTICE

City governments benefit from working closely with national and other levels of government in climate adaptation. Climate impacts have ripple effects across administrative and geographic borders, and higher levels of government can be instrumental in providing data on risk or other supporting resources for cities. Therefore, aligning a city adaptation M&E approach with national (or regional) adaptation processes is ideal. National adaptation processes generally require city input, as many of the adaptation actions take place in cities. Aligning city approaches will save all stakeholders time and resources. In theory, it is fine for a city government to develop a more robust or ambitious adaptation M&E program than their national counterparts, but it does not make sense to develop a less robust one if the city will provide inputs to a national framework.

Ideally, city managers should design an adaptation M&E approach during the development of an adaptation plan, as there are efficiencies to be gained in the process. As mentioned, starting with a limited focus on monitoring outputs (i.e. reporting on implementation) is advised in situations with limited technical capacity. While the city government is tracking progress, city managers can design the theory of change and results chain process to build the foundation for a results-based M&E framework. An assessment of existing M&E frameworks (even unrelated to climate change) can identify existing data collection or monitoring approaches to be leveraged for adaptation. Although setting up a results-based framework is an extensive exercise, the resulting framework does not have to be overly

complex or difficult for stakeholders to understand, and city managers should produce a guiding document that is short with clear direction on actions (Price-Kelly et al., 2015, p. 19).

Table 1. Capacity for M&E and Adaptation M&E Approach

LEVEL OF CAPACITY	APPROACH	PHASE IN
Cities with no existing M&E and limited technical capacity	Begin with monitoring output indicators	Outcome and impact indicators
Cities with existing M&E but limited capacity	Asses existing monitoring indicators for alignment with adaptation concepts	New outcome and impact indicators related
Cities with existing M&E and robust data collection capacity	Design a full results-based framework	More complex indicators

Resources

THEORY OF CHANGE EXAMPLES

Center for the Theory of Change. <https://www.theoryofchange.org/library/toc-examples/>—Provides many examples of theories of change, provides software for mapping and has a lot of resources on the process of developing a theory of change.

Brown, 2016. [USAID Learning Lab blog post on theory of change](#)—Presents the components and process for creating a theory of change, and links to other resources for deeper learning on the concept.

For adaptation specific theories of change see:

Bours et al., 2014. [Guidance note 3: Theory of Change](#) approach to climate change adaptation programming—Provides in-depth adaptation-relevant guidance on developing a theory of change.

DFID-BRACED, 2015. [BRACED Programme Monitoring & Evaluation \(M&E\) Guidance Notes](#)—See p. 25

World Bank, 2017. [Operational Guidance for Monitoring and Evaluation \(M&E\) in Climate and Disaster Resilience-Building Operations](#)—See P. 20 for results framework and resilient cities example.

OTHER RESOURCES

GIZ, 2016. [MACC Tool -Monitoring Adaptation to Climate Change for Projects](#)—An Excel-based tool that walks users through a step-by-step process for creating a project-level M&E plan for adaptation actions. It may be useful for sector-level city government staff who are looking to design project-level M&E that is in line with a citywide adaptation M&E program.

Pícon, D., 2018. [USAID Design and Planning for Resilience M&E at the Activity Level](#)—Provides guidance on a resilience-focused results framework, and on creating a resilience theory of change. While this is not entirely reflective of an adaptation-focused M&E framework, it will provide guidance on the way in which intermediate outcomes and impacts are considered in regard to resilience. The USAID framework includes resilience capacities and an examination of responses to shocks and stresses that is useful for explaining how resilience themes differ from traditional results chains.

Mercy Corps, 2016. [Urban Resilience Measurement: An approach guide and training curriculum](#)—A resilience measurement approach applied to the urban setting. This guide can support city managers in establishing a resilience measurement process that will form the foundation of an adaptation M&E framework and provide support in identifying an adaptation-focused theory of change and logic frame.

USAID, 2018c. [Collaboration Mapping](#)—A mapping tool that helps users identify key stakeholders, their level and type of interaction and influence with each other, and visually maps the results.



Define an Institutional Structure

KEY RECOMMENDATIONS

- **Map an institutional structure early on** in the development process to engage stakeholders at the outset.
- If the city government has an **existing M&E structure**, take advantage of efficiencies by integrating adaptation M&E indicators into the structure. Data collection and analysis of data can be done by sector level agencies in the course of other M&E actions, while reporting will be done by the agency leading the adaptation effort.
- **Set aside sufficient budget for implementation**, including identifying the percentage of level of effort staff are expected to spend learning and implementing M&E.
- **Ensure that the lead agency has the political will** to convene and direct a broad selection of stakeholders, and that adaptation M&E falls within their legal mandate.
- **Create a working group comprised of essential technical staff** to support management and implementation of the framework, both at the city level (comprised of representatives from each relevant departments), and the lead agency level (comprised of staff involved in adaptation and M&E).

GUIDANCE

While designing the approach, city managers should map out a structure of governance that allocates roles and responsibilities and processes for the adaptation M&E framework (Figure 3). The governance map should detail the responsibilities, flow of information, the frequency of activities and the hierarchy of authority, if needed. Establishing a structure and timeline for reporting results will influence the institutional structure supporting the framework. Roles and responsibilities will depend on the approach, but some common ones are listed in the box.

The institutional structure should be matched with sufficient budget (e.g. annual budget submissions from relevant departments) to support the staff time needed to manage and provide inputs to the M&E system, and engage in knowledge sharing or learning activities.

EXAMPLE: Common Roles and Responsibilities

- **LEAD AGENCY:** The framework should be wholly owned by one agency or team within the city government. This team provides a lead coordinating role, manages data collection, analysis, and synthesis, leads and coordinates reporting, and manages knowledge sharing and learning opportunities. The lead agency should have the political will to convene stakeholders and the authority to request data.
- **PROJECT ROLES:** Within each sector, individuals or teams that have control over project implementation and those that collect data for projects play a large role in the framework. Identifying decision-makers that can be champions for the framework and technical staff that can be executors is essential.

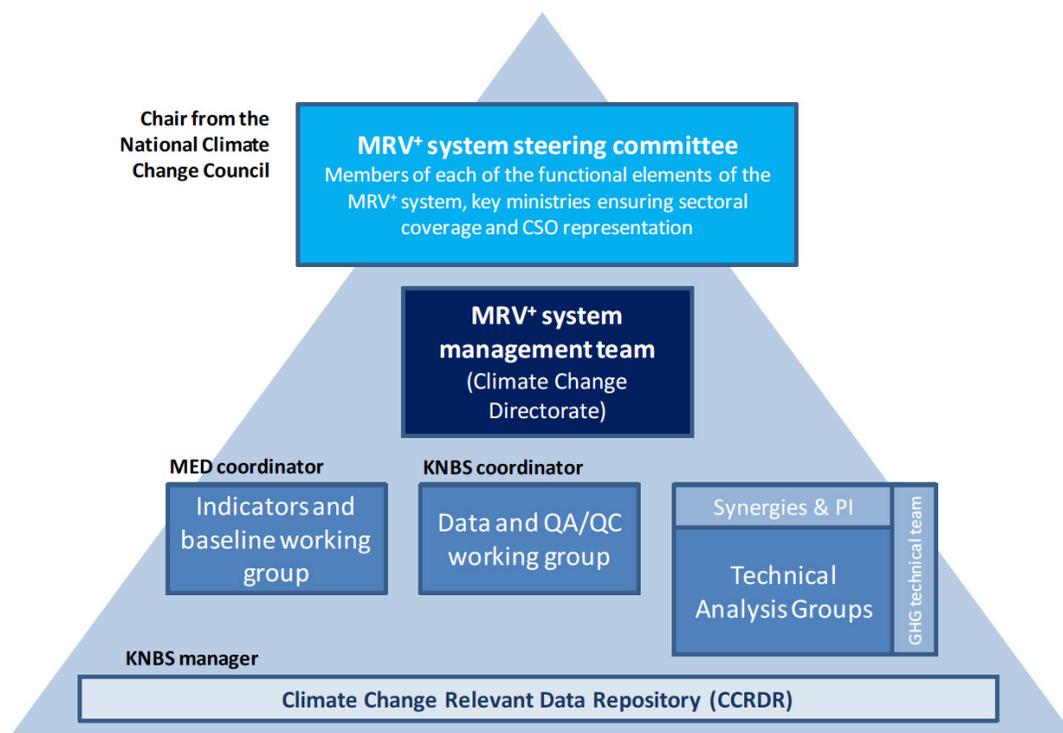
BEST PRACTICE

Establishing a new office or department for adaptation can help signify to the public and all stakeholders the importance of the initiative. It is important, however, not to duplicate personnel or reporting structures. Many city governments establish teams or a new office directly under the mayor's office to ensure that the office has the perceived political clout to advocate for the program. Existing M&E structures can manage the technical components of the program, such as indicator tracking, data collection and analysis, and the new adaptation or climate change office would provide oversight, management, coordination and reporting. It should also be noted that creating a standalone climate change office is not a requirement, and may not necessarily be the best course of action in a city that either (a) already has an effective and functioning climate change team housed under another department, or (b) does not have sufficient budget or appropriate staffing to create a separate office.

EXAMPLE: Technical Working Group Responsibilities

- Developing a climate adaptation action plan
- Helping to develop or validate a theory of change
- Developing and periodically reviewing indicators
- Creating a data collection plan
- Providing data quality assurance reviews
- Contributing to reporting
- Reviewing and providing feedback on the adaptation program and M&E framework
- Conducting evaluation activities or studies

Figure 3. National Performance and Benefit Measurement framework institutional structure



Source: The Government of Republic of Kenya, 2012

To kick off the process, city managers should evaluate existing structures to understand how they could support adaptation M&E; this evaluation could be done as part of the citywide M&E capacity assessment. Mapping existing staff and resources can help identify where a new adaptation M&E framework process would fit in.

Creating a technical working group with stakeholders from all city sectors, the private sector, utilities, academia and civil society can greatly enhance the adaptation M&E approach. In Figure 3 (the institutional structure from Kenya's National MRV) the technical analysis groups feed information up to an MRV systems management team (the Climate Change Secretariat). Working groups can serve to mainstream climate adaptation into all sectors of city government when they are staffed with technical personnel from each department, who bring back climate change knowledge to their departments. Deep and meaningful engagement of staff throughout the city government is critical to climate adaptation and adaptation M&E. Adaptation activities and adaptation M&E must be perceived as part of everyone's daily business. Technical working groups should meet frequently on a schedule aligned with the data collection processes for the framework.

Linkages with scientific institutions can support data collection and analysis (Price-Kelly et al., 2015). For example, New York City invited academics and other experts to serve on the New York City Panel on Climate Change, which is mandated to produce reports on impacts from climate change tied to Intergovernmental Panel on Climate Change assessment reports. This ensures that relevant and updated climate science is available to all city agencies for planning and project development, giving them the ability to create and monitor baseline data. While this type of panel may be difficult for smaller cities, engaging local academia or experts in working groups will decrease the workload on technical staff and provide scientifically sound data analysis.

Resources

Price-Kelly et al., 2015. [Developing national adaptation monitoring and evaluation systems: A guidebook](#) (p. 42) —Provides a discussion on operationalizing an M&E framework (at the national level), and includes guidance on roles and structure that is applicable to cities.

USAID MEASURE Evaluation PIMA, 2017. [The Monitoring and Evaluation Capacity Assessment Toolkit \(MECAT\)](#) (pg. 13)—Tools to assess M&E capacity in government institutions, identify gaps, and plan ways to strengthen M&E systems.



Select Indicators

KEY RECOMMENDATIONS

- The city adaptation or **climate action plan structure guides what is measured** and which indicators are selected.
- **Indicator selection should be done through a broad and deep engagement** with sector-level city staff and key stakeholders.
- **Generic indicators can be used to guide development of customized indicators**, but city managers should test the causal links assumed in generic indicators by using a logic frame incorporating the specific characteristics of the city. For example, “percent increase in green roofs” as an indicator for adaptation to flooding would not adequately measure adaptation in cities that flood due to overwhelmed waterways rather than storm sewer capacity limitations.

GUIDANCE

Indicators drive what is monitored, measured and evaluated in an adaptation M&E framework. There is no standard set of indicators for urban adaptation measurement, and while there are useful examples, city managers will need to develop appropriate indicators for their city, given that each city has different levels of acceptable risk and responds differently to particular hazards. Below is a suggested process for identifying and selecting indicators (see Annex B for indicator examples).

- 1. Define indicators based on reporting needs and city adaptation plans.** Indicators are inextricably linked to purpose and reporting. Indicators inform what is reported, so they should provide the data the city has committed to reporting (to the public, donors or internally).
- 2. Decide on the level of aggregation needed to meet reporting requirements.** The structure of the indicators will dictate

EXAMPLE: Adaptation Plans Set the Framework for Indicators

A city's existing adaptation plan guides which elements of an adaptation process a city is monitoring.

- **Rotterdam's** adaptation plan and M&E framework is arranged around the city's specific hazard.
- **New York City** indicators are based on the OneNYC plan themes, specifically, for achieving resilience of neighborhoods, infrastructure, buildings and coastal defenses.

Options for framing include monitoring per the following:

- **Adaptation action**—for example, an action to increase green infrastructure to reduce storm water runoff.
- **Hazard**—for example, flooding due to intense precipitation.
- **Goal**—for example, a significant reduction in the occurrence of combined sewer overflows after an intense precipitation event.

how indicators are aggregated, like those that report across sectors and projects. Does the city adaptation plan commit to achieving citywide adaptation goals, regional goals or neighborhood goals? For example, a commitment to a citywide increase in awareness of climate impacts would be aggregated from data collected from each sector (transport, energy, planning, etc.) but reported at city-wide scale.

3. Create and define indicators through stakeholder engagement, using the adaptation logic frame.

- a. Use the technical working group to guide development of indicators and inform data collection possibilities.
- b. Identify where process indicators are sufficient and where outcome indicators should be established. A combination of both is ideal.

4. Process indicators measure inputs and progress and are good for measurement of short-term action. Establishing short-term indicators that can demonstrate progress on building resilience in the near term will be important for city managers that need to justify spending on adaptation actions. In general, impacts from adaptation investments take time. For cities starting adaptation actions, process indicators may be the bulk of initial indicators as they work to build outcome indicators.

5. Outcome indicators are good for measuring intermediate outcomes and higher-level outcomes (for example, reduced vulnerability of a number of people to climate change) **across a longer period of time.** They tend to require more complex data inputs that may require more resource-intensive data collection efforts (like household surveys).

How to Develop a Logic Frame for an Indicator

Ask the following questions of a technical working group to test the causal links between a suggested indicator and a desired outcome.

- How would we know that change has happened in this outcome?
- How will we know success when we see it?
- What would be the evidence of this change?
- What are preconditions necessary for achieving success?
- What other factors may influence outcome?

The answers to these questions can establish a logic frame for how an indicator will provide evidence of a particular outcome.

Source: (Bours 2014b p5.)

Output Versus Outcome Indicators

Output: Results of activities at the program level, measured by the number of activities performed or services used. Outputs are the tangible, immediate, and intended products or consequences of an activity. Examples of outputs include: number of trees planted, number of staff trained, or number of climate change policies passed (Frankel and Gage, 2007; USAID, 2018)

Outcome: Changes observed as a result of a given program, measured at the population level in the program's target population. Outcomes refer to specific knowledge, behaviors, or practices on the part of the intended audience that are clearly related to the program, can reasonably be expected to change over the short-to-intermediate term, and that contribute to a program's desired long-term goals. Examples of outcomes include: number of people using climate information to improve resilience to climate change, or percent change in agricultural productivity due to irrigation (Frankel & Gage, 2007, p. 77).

6. Develop a mini-logic frame for each indicator to test the assumption that the indicator provides evidence of performance. Mapping out the causal relationship between indicator and outcome is essential in adaptation M&E, as there is no direct metric (like GHG emissions) that measures achievement of adaptation.

7. Review existing data collection efforts.

Determine where existing data can support the indicators the stakeholder group selected.

a. For indicators which existing data cannot currently support, determine if it is feasible to collect new data to support the indicator at this time, or if the indicator should be shelved for future development. City managers should consider using the criteria listed here for decision making.

b. Identify proxy indicators that can help triangulate data to determine progress toward results/objectives. Finding the right balance between robust and practical data collection is key to not overburdening an adaptation M&E framework.

8. Establish a baseline for each indicator and identify a process for updating it (dynamic baseline) **in defined increments of time.** It is useful to align baseline updates with other data collection and reporting tasks, such as GHG inventories or vulnerability assessments.

9. Create packages with a mix of quantitative and qualitative indicators for the essential elements of the adaptation plan. City managers do not need to come up with a single quantifiable metric for each element or distill all data down to one reporting metric. Instead city managers should select the most important areas for monitoring and consider creating a package of indicators for each element that is being reported on, with variable metrics, including process indicators and outcome indicators. This package will tell a much broader story about progress toward adaptation than any single metric.

Criteria for Evaluating Need for New Indicators

- **Incremental cost** needed to collect the data
- **Technical expertise** needed
- Need for **new technologies**
- **Risk posed** by not having the data collected (for example, flooding sensors provide more accurate data on floods but may be expensive to place and maintain, however if a city has no other way to track the occurrence of flood and the city frequently is inundated with floods it may be worth the cost)

EXAMPLE: Dynamic Baselines

The **Action Research for Community Adaptation in Bangladesh** (ARCAB) project employed dynamic baselines because of the long-term nature of the project. In order to account for changes in the environment and context of the project, as well as new knowledge and insights gleaned from the project's research, ARCAB developed a process to periodically review and revise baselines over time (ARCAB, 2012).

10. City managers should develop an indicator reference sheet (see Annex A for an example). These reference sheets provide all the context for the indicator definition and calculations for all stakeholders and data collectors. It also includes information on where and how data will be sourced for the indicator.

BEST PRACTICE

Indicator baselines should be revisited periodically and adjusted to reflect changes in risk, impacts or development achievements; this is called dynamic or shifting baselines. Dynamic baselines reflect the complex and quickly evolving nature of climate change risk and the interplay of development context. Redefining baselines can be tied to a city's ongoing risk assessments or development assessments, which will directly feed information about some indicator baselines. A shifting baseline (caused by worsening climate change impacts) can mean that holding the baseline constant can be considered successfully achieving adaptation.

As the urban adaptation field develops, standardized indicators, which can be adapted to the local context, will likely be developed to guide cities. City managers can adapt indicators by testing the assumptions underpinning the theory of change with specific characteristics of their city, such as location, climate, development context, infrastructure and governance systems.

Resources

Bours et al. 2014. [Guidance note 2: Selecting indicators for climate change adaptation programming](#)—Details the process of indicator selection with guidance on logic frames and theory of change approach to indicator mapping.

Christiansen et al., 2016. [Monitoring & Evaluation for Climate Change Adaptation: A summary of key challenges and emerging practice](#) (pp. 7–9)—Details baseline issues, explains the concept of a “shifting” or dynamic baseline and makes suggestions for best practice in establishing a dynamic baseline.

Clean Air Partnership, 2015. [Are we there yet? Applying Sustainability Indicators to Measure Progress on Adaptation](#)—Provides a case study approach to presenting sample indicators. The case studies cover process and outcome-based indicators to measure sustainability in four sectors: coastal management, flood management, infrastructure and health.

USAID, 2016. Performance Indicator Reference Sheet Template and Guide (see Annex A). A Performance Indicator Reference Sheet (PIRS) is a tool USAID uses to define performance indicators; it is key to ensuring the quality and consistency of indicator data. City managers can use the reference sheet and guide to understand the elements of a strong indicator.

Mayors Adapt Office, 2016. [Global Covenant of Mayors Adaptation Scorecard](#)— Reporting guidelines and include a long list of sample indicators for vulnerability, outcome and impacts for adaptation.

GEF, 2011. [Climate Change Adaptation Tracking Tool](#)—An Excel-based tool for GEF projects to track adaptation outcomes. It is a good example of aggregated indicators.

GIZ, 2014. [Repository of Adaptation Indicators](#)—A large repository of indicators for national adaptation, but many are applicable to citywide or sector indicators.

C40, 2019. [Measuring Progress in Urban Climate Change Adaptation](#)—Provides a list of detailed indicators organized by hazard for cities to consider.

Establish a Data Collection, Storage and Use Plan

KEY RECOMMENDATIONS

- **Examine existing data and data collection approaches** to identify data that can feed into selected adaptation indicators.
- **Create a data collection plan that identifies data gaps** and plans for data collection processes. Ensure that data security is a core component of the plan, using best practices for data security.
- **Engage data collection stakeholders early and often**, creating strong partnerships for sharing.

GUIDANCE

A data plan specifies the data to collect, the agency/department responsible for collecting the data, how the data should be collected and how often and storage and use of the data after collection. Data collection depends on the type of data needed. City managers are advised to examine existing data collection processes and types of data available through a consultation workshop with each relevant agency. This process can also determine the capacity for collecting and analyzing data in each sector, the type of data collected in each sector and the frequency of collection.

Figure 4. Kenya National MRV Data Mapping

DATA SOURCE	RELEVANT SECTOR	DESCRIPTION OF DATA
Kenya Meteorological Department	All	Climatic data (from upper air and rainfall stations, marine tidal gauges, etc.).
	Agriculture	Agro-meteorological stations collect data on climate & surrounding farms.
Kenya Agricultural Research Institute	Agriculture Livestock	Data on food, horticultural and industrial crops, animal production, animal health, soil fertility, vegetation, agroforestry, and irrigation. In future, data on household vulnerability and performance of various crops under changing climatic conditions will be collected.
Department of Resource Surveys and Remote Sensing	Forestry Wildlife Agriculture Livestock	Data on livestock/wildlife numbers and distribution, vegetation cover, forests, species composition, biofuel, biomass, crops, land degradation, and human settlements.
Water Resources Management Authority	Water	Data on flow volumes at river gauging stations; from hydro meteorological weather stations.

Source: Price-Kelly et al. 2015, p. 39

In a data collection workshop, the teams can map the available data and where the data are stored—see Figure 4 from the Kenya national MRV framework—and match data to draft indicators for the adaptation M&E framework. Having draft indicators will be useful for the workshop, but the type of data collected and the capacity for data collection will influence the number and type of indicators selected, so the process may be iterative.

BEST PRACTICE

Data collection processes need to strike a balance between providing robust data and overburdening city agencies with cost and difficulty. Data collection is a time-consuming and resource-intensive activity, and city managers need to plan for and make human and financial resources available to support it. City managers should not design indicators that require data that the city government cannot produce, which ensures compromised or poor data are used to support the indicator.

Data collection should also double as a capacity-building tool. Many adaptation M&E frameworks at the donor and national level use scorecards as data collection tools. Scorecards are developed (per project, per indicator or per sector, depending on program design) to be used in stakeholder workshops that engage teams on identifying a baseline level, setting a target for the indicator and reporting intermittently. Indicator scorecards can standardize data collection and help in aggregating data up to citywide level or providing a metric for qualitative data. They also can be an effective and efficient way of collecting quantitative and qualitative data for multiple indicators at one time, decreasing the cost and burden of data collection.

Low-quality data can be a reality for many cities: this may include incomplete data sets, scaled

EXAMPLE: Data Collection Plan Components

- **Sources of data** for each indicator
- **Data collection tools** used for each indicator. Examples include:
 - **Primary data:** surveys, focus groups, sensors or site-based measurement tools
 - **Secondary data:** reports, vulnerability assessments, risk assessments, development data
- **Frequency** of data collection
- **Responsibility** for data collection (per indicator)
- **Data quality standards** (USAID data quality standards include: validity, integrity, precision, reliability and timeliness)
- **Data validation** and quality assurance practices
- **Estimated cost** of data collection and indication of budget available to cover costs
- **Definition** of the output of data collection

EXAMPLE: Data Sources

- **Local weather and climate information can be supplemented by satellite data.** For example, Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) data can be used to supplement or make up for the lack of local weather stations.
- **Poor data on flooding occurrence** can be supported by community feedback surveys recording flooding occurrence and impact (Christiansen et al., 2018).

national data or other types of adapted data. Establishing stable, consistent data collection processes and analysis will ensure that low-quality data do not overly impact indicators. Low-quality data can be bolstered with qualitative narrative or community feedback. Timeliness of data is key, and data collection should be timed to ensure that up-to-date data are available for key decision-making processes. Version control protocols can also help reduce errors produced by data transcription and transfer.

City staff need to be creative about sourcing and obtaining data. Leveraging academic, nonprofit and private sector relationships will be crucial, as organizations outside the government often either produce their own complementary data, or are involved in cleaning up or aggregating data for their own purposes (e.g., research). Additionally, building partnerships to obtain sensitive data may be necessary; anonymized data from partners can decrease risk of data breaches and ease the burden of data collection.

Data security and storage protect sensitive data and ensure efficient access and appropriate use of data. Data for the adaptation M&E framework should be stored in a central, secure database. Anonymize all data that include personal identifiable information of the population and refrain from collecting this sensitive information unless absolutely necessary. Establish protocols for how and when information is shared internally and publicly, as unprocessed or incomplete data released to the public can cause confusion or incorrect assumptions.

EXAMPLE: Data Partnering Between Local and National Government

Johannesburg, South Africa is partnering with the National Department of Water Affairs and Environment to improve river gauge monitoring to determine occurrence of flooding. The two entities are recalibrating existing river gauges and installing new equipment to remotely capture data on river level, flow characteristics and peak flood data. (Government of Johannesburg, 2014)

EXAMPLE: Data Sources

- **Climate trend** data from national meteorological agencies
- **Climate projection** data
- **Socioeconomic** data on household-level activity
- **Utility use** data
- **Emergency services** data
- **City information services** reports (e.g., 311 reports in the US)
- National databases of **infrastructure** (Ex. Databases of bridges)
- **Community feedback**
- **Household surveys**
- **Expert interviews**
- **Site-based tools** like flood sensors
- Frequent **vulnerability assessments**
- **Hazard maps**

See the Resources section for links to specific data sources useful for cities

Resources

OPEN SOURCE GEOSPATIAL DATA

(See more sources for city specific data in sample indicator matrix Appendix B.)

[Open Street Map](#)—a free editable map of the world, volunteer registered users collect data about locations and share it for free.

[Secondary Cities Geonode](#)—an online platform for sharing map data and resources generated by the Secondary Cities Initiative

[The Urban Environment and Social Inclusion Index](#)—leverages high-resolution, large-scale data to reveal how cities perform at the intersection of environment and social equity. The data sets include information per neighborhood like transit proximity, air pollution levels and tree cover.

[Google Earth](#)—Global satellite data with GIS capabilities.

OPEN SOURCE CLIMATE DATA

[NASA Global Change Master Directory](#)—a high quality resource for Earth science data and data-related services worldwide.

[University of East Anglia's Climate Research Unit datasets](#)—provides instrumental climate data, climate model data and future projections, and other climate data.

[NOAA Global Historical Climatology Network](#)— an integrated database of climate summaries from land surface stations across the globe that have been subjected to a common suite of quality assurance reviews.

[NCAR Climate Data Guide](#)—search and access 201 data sets covering the atmosphere, global temperature and precipitation, climate indices and more.

[The World Bank Climate Change Knowledge Portal](#)—Provides country level historical data and future projections on vulnerabilities and impacts.

RESOURCES FOR DATA PLANNING

[USAID PPL 2017. How-To Note: Project Monitoring, Evaluation and Learning Plan](#)—Provides guidance on how to collect, manage and store data for indicators on USAID projects.

Vaughan, 2018. [Resilience Measurement Practical Guidance Note Series 3: Resilience Capacity Measurement](#) (p. 13)—This section provides guidance on planning data collection for a resilience capacity measurement activity and provides general suggestions on types of data and resilience-specific data sources.

Price-Kelly et al., 2015. [Developing national adaptation monitoring and evaluation systems: A guidebook](#) (p. 36)—Discusses data sources and approaches for data collection that can be relevant for cities, including how a city may be able to take advantage of national data.

Brooks and Fisher, 2014. [Tracking Adaptation and Measuring Development: a step-by-step guide](#) (p. 73)—Annex 1 of this document provides a sample Climate Risk Management Scorecard. This is a good example of using scorecards to put metrics on qualitative data and aggregate the data up to a comparable data set.

Design a Reporting Structure

KEY RECOMMENDATIONS

- **City managers should structure internal and external reporting based on the purpose** of a city adaptation program and the need for learning and public transparency.
- **Budget to support professional, graphic and compelling reporting** that includes local stories and experiences.
- **Align reporting with project development** and other levels of government reporting.

GUIDANCE

Reporting structures depend on reporting needs and audiences. Some adaptation reports are for internal city government audiences and others for the public. The type and frequency of adaptation reporting will depend on the purpose of the adaptation action. For learning-focused frameworks, external reporting may not be necessary; periodic internal reports on lessons learned may suffice. For cities that are required to report up to national level adaptation M&E frameworks, the reporting structure will be dictated by the national framework and will likely include city-wide aggregated reporting of indicators. Many cities have public commitments made through published resilience and adaptation plans and are required to release periodic progress reports. Some cities also report through city networks like C40, or other city reporting platforms like the Global Covenant of Mayors or CDP Cities. These various drivers will dictate the structure of reporting needed.

Figure 5. Buenos Aires Reporting on River Basin Improvement Project for Flood Mitigation



Source: C40, 2019c

The reporting structure helps to define the outputs that are needed from the adaptation M&E framework. City managers should define a structure for progress reports (usually mirroring the framework for any adaptation plans), the frequency of reporting and the level of aggregation (i.e., per action level, per sector level or for a citywide resilience goal). Cities may have detailed data on project-level activities to report, or citywide aggregation may be more appropriate for reporting on some indicators. For example, Figure 5 shows project level reporting on Buenos Aires's flood management project with project outcome level indicators.

In comparison, the Kenya National Performance and Benefit Measurement Framework requires reporting inputs from local county governments on county-wide aggregated indicators defined in Figure 6.

Cities should consider budgeting for the program early on in the adaptation M&E development process, as resources will be needed for the reporting process, which can be time consuming for staff and may require external support on graphics, editing and quality assurance.

BEST PRACTICE

City managers should consider how reporting outputs from the framework will align with individual project cycle development. Timely reporting can allow for mid-project adjustments or align to feed lessons learned into new project design.

Public reporting provides transparency and accountability on how funds are spent. The best city progress reports combine quantitative data with qualitative narrative to present a strong description that stakeholders (including the public) can

Figure 6. County-level outcome indicators for reporting into the Kenya National Performance and Benefit Measurement Framework

County-level indicators (outcome indicators)	
1.	% of county roads that have been made 'climate resilient' or that are not considered vulnerable
2.	% of people by gender in the county permanently displaced from their homes as a result of flood, drought or rises in sea level
3.	% of water demand that is supplied in the county
4.	% of poor people by gender in drought-prone areas of the county with access to reliable and safe water supplies
5.	% of total livestock numbers killed by drought in the county
6.	% of area of natural terrestrial ecosystems in the county that have been disturbed or damaged
7.	% of poor farmers and fishermen in the county with access to credit facilities or grants
8.	% of population by gender in areas subject to flooding and/or drought in the county who have access to climate information on rainfall forecasts
9.	Number of ministries at county level that have received training for relevant staff on the costs and benefits of adaptation, including valuation of ecosystem services
10.	% of new hydroelectric projects in the county that have been designed to cope with climate change risk

Source: Government of Republic of Kenya, 2012

easily relate to. Easily digestible reports help readers understand the progress of the project and the causal links between complex technical data and their own lived urban experience. The graphic format and presentation of public reports also influence who reads them and how information is perceived. City managers should invest in professional editing and graphics production, if possible, to ensure their message is coherent and compelling.

City managers should, where possible, align their reporting with national reporting on adaptation, or donor-required reporting, in terms of timing, structure and types of data collected. This will save time and money by not requiring data to be collected and arranged for multiple different indicators and structures. Engaging with the national government to make linkages between reporting frameworks is key. City stakeholders are often asked to feed data and reporting on city action into national reporting. Instead of duplicating processes, city managers can leverage this effort and connect with surrounding communities that may be outside of city jurisdiction but are affected by regional climate impacts.

Resources

C40, 2019. [Climate Action Planning Resource Centre](#)—Provides comprehensive support (including a step-by-step framework) for climate action planning. The center has an adaptation-specific section with case studies and other support for adaptation planning and reporting.

NYC, 2018. [OneNYC 2018 Progress Report](#)—OneNYC is New York City’s climate action plan for mitigation and adaptation. The city reports on progress yearly with detailed data-driven reporting supplemented by qualitative stories that connect readers with the experience of New York residents.



Define Evaluation

KEY RECOMMENDATIONS

- **City managers should not ignore or delay plans for evaluation** or conflate monitoring with evaluation. Evaluation should have its own structure, budget and plan and extend to include the adaptation M&E framework.
- **Evaluative monitoring**, an emerging practice which combines evaluation into monitoring activities, allows for ongoing feedback loops and iterative learning which will support improvements in the design and implementation of future adaptation actions.

GUIDANCE

Evaluation is a core component of M&E but is often not defined separately from monitoring. Monitoring provides data for indicators but monitoring alone cannot explain why a program succeeds or fails. Evaluation requires planning and structure, and often requires a separate skill set from monitoring. All approaches should include an evaluation plan for reviewing the progress, performance and context of the program activity, as well as identifying internal or external resources to conduct the evaluations.

Evaluation traditionally occurred only periodically within monitoring frameworks, commonly conducted as ex-post, and sometimes as midcycle reviews with the limited scope of evaluating if a project met its intended objectives. However, the adaptation process is unique in that it has no end mark; it is a continual and evolving process cycle and is influenced by many external factors. It is useful in adaptation M&E that evaluation should also become a continual process cycle that examines not just if a project met expected outcomes, but also how and why, and if it contributed to unexpected or unintentional outcomes.

EXAMPLE: Evaluation Plan Components

- **Evaluation triggers** (i.e., when should evaluations be conducted?)
- **Evaluation purpose** and expected use
- **Evaluation type** (formative, summative, economic evaluation, impact evaluation) and methodology
- **Name entity in charge** of evaluation
- **Identify the timing** and frequency
- Name all **stakeholders**
- An estimated **budget**

According to USAID “the purpose of evaluations is twofold: to ensure accountability to stakeholders and to learn in order to improve development outcomes” (USAID PPL, 2017). This should be applied not just to the activity within the adaptation plan, but should also include evaluations of the M&E framework itself.

City managers should align evaluations of adaptation actions with the adaptation action development cycle, to be able to utilize lessons learned to improve the project during its life cycle, and feed into the design of new activities.

BEST PRACTICE

Continuous evaluation of activities is called “evaluative monitoring,” where evaluation and monitoring are conducted concurrently to both understand what progress a program is making towards its intended outcomes, and to understand why and how the program is making progress. Thinking of evaluations as a part of the monitoring process is particularly relevant to adaptation M&E. Evaluative monitoring can be a positive supplement to periodic evaluation reviews and provide city managers with ongoing information about the many factors influencing adaptation actions. Evaluative monitoring supports the work of testing the causal links in a city adaptation theory of change.

Evaluation plans that extend to the adaptation M&E framework should include a process for feedback loops for all stakeholders to continually assess the framework processes. City managers should incentivize evaluation and learning by providing staff the time to engage in trainings and consultation workshops to build capacity.

Resources

USAID PPL, 2017. [How-To Note: Project Monitoring, Evaluation and Learning Plan](#)—Describes the significance and process for creating evaluations at the project level.

USAID, 2015. [USAID Evaluation Toolkit](#)—Provides a more in-depth look at USAID-specific evaluation processes and includes good examples of best practice in evaluations and necessary steps.

DFID-BRACED, 2015. [BRACED Programme Monitoring & Evaluation \(M&E\) Guidance Notes](#)—Presents the concept of evaluative monitoring and provides best practice examples of how to conduct it on development projects.



Create Opportunities for Learning and Development

KEY RECOMMENDATIONS

- **City managers should consider learning as a core component** of adaptation measurement, even if it is not the core purpose of the framework. Capturing and sharing knowledge will inform decision-making on future adaptation actions and support the evolution and improvement of adaptation.
- **City managers should budget for both financial and human resources** for knowledge capture and sharing.

GUIDANCE

Using the outputs of M&E, city managers should create a learning approach that integrates lessons learned into the framework, providing opportunities for knowledge sharing and learning. A learning plan will focus on how the outputs from the monitoring and evaluations will be used to inform learning, and how that learning will take place.

Learning can take place in informal team meetings or lunch and learns, or more structured workshops or classroom/online courses. For example, Norway uses frequent stakeholder engagement surveys and workshops to collect lessons learned, then packages these lessons in white papers or trainings for key government stakeholders.

BEST PRACTICE

Similar to evaluation, city learning plans should include opportunities to build capacity on the adaptation M&E framework, in addition to learning opportunities on the adaptation actions.

Learning opportunities do not need to be costly but should be frequent and designed to build knowledge iteratively (DFID-BRACED 2015, p. 65).

EXAMPLE: Learning Plan Components

Learning events can leverage the data a city collects to use as a capacity-building tool. A learning plan should include the following:

- Details of **what data** are used to guide learning.
- **Identify who** will be included in learning opportunities.
- **Choose stakeholder(s)** responsible for extracting lessons learned.
- **Identify type and style and timing** of learning events that will take place.

Encourage learning opportunities and reviews throughout action implementation and align learning opportunities with evaluations to make sure the outputs shared in learning opportunities are up to date.

Resources

USAID PPL, 2017. [How-To Note: Project Monitoring, Evaluation and Learning Plan](#)—Describes the significance and process for creating evaluations at the project level.

DFID-BRACED, 2015. [BRACED Programme Monitoring & Evaluation \(M&E\) Guidance Notes](#)—This adaptation M&E framework focuses on learning as a core component of activities and provides best practice examples for learning in Note 7: Supporting project to programme evidence and learning (beginning on p. 74).

Pringle et al., 2011. [AdaptME toolkit: Adaptation Monitoring & Evaluation](#)—Focuses on evaluation of adaptation actions and provides a helpful review of the link between evaluation and learning and some best practice in adaptation learning (beginning on p. 7).

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ANNEX A: INDICATOR REFERENCE SHEET TEMPLATE WITH INSTRUCTIONS AND EXAMPLE

Indicator Reference Sheet			
Name of Indicator:			
Name of Result Measured (IR, sub-IR, Project Purpose, Project Outcome, Project Output, etc.):			
DESCRIPTION			
Precise Definition(s):			
Unit of Measure:			
Disaggregated by:			
Rationale or Justification for Indicator (optional):			
PLAN FOR DATA COLLECTION			
Data Source:			
Method of Data Collection and Construction:			
Reporting Frequency:			
Individual(s) Responsible:			
TARGETS AND BASELINE			
Baseline Timeframe:			
Rationale for Targets (optional):			
DATA QUALITY ISSUES			
Date of Previous Data Quality Audit:			
Date of Future Data Quality Audit (optional):			
Known Data Limitations:			
CHANGES TO INDICATOR			
Changes to Indicator:			
Other Notes (optional):			
INDICATOR VALUES			
Year	Target	Actual	Notes
Year 1			
Year 2			
Life of Project			
THIS SHEET LAST UPDATED ON:			

Instructions for Completing the Indicator Reference Sheet

Name of Indicator: Enter the full title of the indicator.			
Name of Result Measured (IR, sub-IR, Project Purpose, Project Outcome, Project Output, etc.): Enter the full name and number (e.g., IR 2.1) of the relevant result.			
DESCRIPTION			
Precise Definition(s): Define the specific words or elements used in the indicator. Remember to define any terms that may be ambiguous. For example, how do you define training? Is there a minimum requirement or standard? How are classrooms defined? How is “improvement” qualified and so on...			
Unit of Measure: Enter the unit of measure (<i>number of...</i> , <i>percent of...</i> , or <i>US dollars</i>). Clarify the minimum or maximum values if needed (<i>minimum score is 1.0 and maximum score is 5.0</i>). Clarify if the number is cumulative or specific to the year. Clarify numerator and denominator if applicable.			
Disaggregated by: List any planned ways of disaggregating the data (<i>male/female, youth/adult, urban/rural, region, etc.</i>) and justify why useful.			
Rationale or Justification for Indicator (optional): Briefly describe <i>why</i> this particular indicator was selected to measure the intended result and <i>how</i> it will be useful for managing performance.			
PLAN FOR DATA COLLECTION			
Data Source: Identify the source of data (e.g., DHS survey; ministry data; direct data source such as sign in sheets, survey, community based registers, etc)			
Method of Data Collection and Construction: Describe the tools and methods for collecting the raw data. Examples include: ledger of patient names, document review, structured interviews, focus group interviews, written survey, direct observation, self-reported information, and so on. If the indicator is constructed, such as an index or an expert panel assessment, describe the procedure for construction. Who collects the raw data and where is it stored?			
Reporting Frequency: Describe <i>how often</i> data will be reported on and <i>when</i> .			
Individual(s) Responsible: Identify the specific staff member <i>directly responsible</i> for acquiring the data.			
TARGETS AND BASELINE			
Baseline timeframe: State the timeframe (quarter, year, etc.) that will serve as the baseline value for this indicator. If baselines have not been set, identify <i>when</i> and <i>how</i> this will be done. While this information is optional for the PIRS, data tracking tables should identify a baseline timeframe and value. See Learning Lab Monitoring Tool Kit " Performance Indicator Baselines " for more information on baselines.			
Rationale for Targets (optional): Explain the basis on which targets are set (e.g., identify specific trends to make reasonable projections based on anticipated level of effort and resources). While this information is optional for the PIRS, data tracking tables should include rationales for targets along with target values.			
DATA QUALITY ISSUES			
Date of Past Data Quality Audit: Enter the date of previous data quality audit			
Date of Future Data Quality Audit (optional): Enter the planned date for subsequent data quality audits			
Known Data Limitations: Enter any major data limitations			
CHANGES TO INDICATOR			
Changes to Indicator: Document here any changes to indicator, such as a change in the how the data is collected, not changes in the indicator data. Specify (1) the date of the change (2) the change that was made, and (3) the reason for the change.			
Other Notes (optional): Use this space as needed.			
INDICATOR VALUES			
Year	Target	Actual	Notes
Year 1			
Year 2			
Life of Project			
THIS SHEET LAST UPDATED ON: mm/dd/yy			
To avoid version control problems, type the date of most recent revision or update to this reference sheet.			

Example Indicator Reference Sheet

Name of Indicator: Number of people receiving training in climate change adaptation principles			
Name of Result Measured: IR 1: Increased island resident capacity to adapt to the impacts of climate change Sub IR 1.1: Increased island resident awareness of climate change adaptation and water resource management principles			
DESCRIPTION			
Precise Definition(s): Training is defined as a learning activity for participants involving designated instructors or lead persons, and defined learning objectives and outcomes. Training in global climate change include trainings, workshops or events that address water resource management and climate change adaptation, such as island water management plan workshops, youth activities and field trips to local islands to learn about environmental practices and opportunities, and other activities related to the campaign for the link between climate change and water resources and environmental management. Only persons successfully completing the training, or attending the full workshop/event will be counted. "Persons" is, for this purpose, actually to be "person competencies", meaning that one person may be trained in more than one area of competency and will be counted for each competency.			
Unit of Measure: Number			
Disaggregated by: Male/Female			
Rationale or Justification for Indicator (optional): Training can contribute to strengthening capacity and promoting strategic partnerships. Training also improves the likelihood that development partners will continue to implement relevant interventions after project support has ended. Trainings on island water management and the link between climate change and water management are crucial for achieving the IR.			
PLAN FOR DATA COLLECTION			
Data Source(s): Training completion records, training, workshop or event attendance sheets. Photos and trip reports.			
Method of Data Collection and Construction: Project staff tallying number of individuals who satisfactorily complete each training, or fully attend workshop/event.			
Reporting Frequency: As activities are implemented and concluded.			
Individual(s) Responsible: Monitoring & Evaluation Lead			
TARGETS AND BASELINE			
Baseline timeframe: Year			
Rationale for Targets (optional): Targets based on annual training needs in order to ensure 10 percent of the island's population receives training by the project's end date.			
DATA QUALITY ISSUES			
Date of Past Data Quality Audit: August 2016			
Date of Future Data Quality Assessments: Annual			
Known Data Limitations: <i>Validity:</i> This indicator addresses only the training of knowledge and skills related to climate change. It may not translate to action nor is it a direct indicator of changes in institutional or organizational capacity. <i>Precision:</i> Simply knowing the number of people does not reflect the depth of skills and knowledge conveyed, or capacity to act. <i>Reliability:</i> Reliability becomes a concern if the number of training hours is not counted in the same way. Counting procedures should be consistent throughout the life of the activity.			
CHANGES TO INDICATOR			
Changes to Indicator: None			
Other Notes (optional): None			
INDICATOR VALUES			
Year	Target	Actual	Notes
Year 1	2,000		
Year 2	4,000		
Life of Project	6,000		
THIS SHEET LAST UPDATED ON: March 3, 2017			

ANNEX B: INDICATOR EXAMPLES

Indicator examples were taken and adapted from the following sources:

- GIZ, 2014. [Repository of Adaptation Indicators](#)
- Clean Air Partnership, 2015. [Are we there yet? Applying Sustainability Indicators to Measure Progress on Adaptation](#)
- C40, 2019b. [Measuring Progress in Urban Climate Change Adaptation](#)

Hazard	Action	Output Indicator	Outcome Indicator	Impact indicator	Sector	Potential Data Sources
Flooding	Increase green infrastructure in city spaces (parks, rain gardens, planting, conversion of hardscape)	Area (m2) of additional green infrastructure added to the city	% of heavy rainfalls that lead to hazardous flooding	# of displaced businesses, homes, or people from flooding Assets (\$) impacted by flooding	Cross-sector	Planning, environmental, storm water management agencies Flooding sensors Public reports of flooding Insurance claims
Heat	Increase green infrastructure and reduce black top (green roofs, planting) install white roofs, reduce black hardscape	Area (m2) of installed white roofs, green roofs, or other urban heat island reducing infrastructure	Reduction in degree Celsius difference between urban centers and rural areas	# of Number of people impacted from heat stress	Cross-sector	Planning, environmental, storm water management agencies Meteorological agency Ambulance dispatch calls, hospital admissions for heat stroke
Flooding	Flood proof public transportation (train stations, train tracks)	# of stations or train lines with installed protections	% of public transportation disrupted from flooding	# of injuries or deaths from flooding in public transport \$ of repairs, and cost of lost economic productivity	Transportation	Transportation agency Ambulance dispatch call or hospital admissions Finance administration
Sea-level rise (or other water way flooding)	Flood risk reduction activities at critical facilities (temporary barriers, relocation of key building systems)	# of facilities protected	% of critical facilities impacted in flood conditions	\$ of repairs, and cost of lost economic productivity	Buildings, Infrastructure	Cross-sector (Energy, Transport, other, depending on facility types) Finance administration

Hazard	Action	Output Indicator	Outcome Indicator	Impact indicator	Sector	Potential Data Sources
Multiple hazards	Improve or install early public warning systems for flood, heat, cold, etc.	# of early warning systems installed and operating	% of population reached early during hazardous event	Number of lives lost or people injured during hazard	All sectors	Disaster response agencies or departments
Air quality	Implement regulations to limit particulate emissions from select sectors and reduce air pollutant hot spots	# of sectors regulated	% reduction of air pollutants emitted	Annual average measurement of air pollutants Disparity in air pollutant measurement across neighborhoods	Industry, building, transport, energy	Environmental agency
Tropical cyclones	Relocate informal settlers from high risk areas	Number of households in high risk areas relocated	Percent of population living in areas deemed high risk to hazards	Number of deaths and injuries due to extreme weather events	Cross-sector	Hazard maps Climate vulnerability assessments Census data Survey data
Drought	Increase irrigation in agricultural operations within the municipality	Linear meters of irrigation installed	Percent change in agricultural productivity due to irrigation	Crop losses during drought event, in metric tons	Agriculture	Farmers' records Department of Agriculture records Pre- and post-event surveys

ANNEX C: LIST OF ALL RESOURCES BY M&E COMPONENT

Applicable to all steps of development	
C40 2019. Measuring Progress in Urban Climate Change Adaptation	Urban focused framework for monitoring and evaluation of adaptation. It provides a framework, examples and detailed indicators for cities to consider.
GIZ 2017. The Adaptation M&E Navigator	An online toolkit with guidance on each component of adaptation M&E.
Price-Kelly et al., 2015. Developing national adaptation monitoring and evaluation systems: A guidebook	A national guidebook to all components of adaptation M&E.
Brooks and Fisher, 2014. Tracking Adaptation and Measuring Development: a step-by-step guide	TAMD is a conceptual framework to monitor and evaluate climate change adaptation. This toolkit provides step-by-step guidance to develop a robust M&E framework that can be used as part of local and national planning systems.
Adaptation planning and resilience measurement (Pre-M&E preparation)	
C40, 2019. Climate Action Planning Resource Centre	Provides comprehensive support (including a step-by-step framework) for climate action planning. The center has an adaptation-specific section with case studies and other support for adaptation planning and reporting.
Mercy Corps, 2016. Urban Resilience Measurement: An approach guide and training curriculum	A resilience measurement approach applied to the urban setting. This guide can support city managers in establishing a resilience measurement process that will form the foundation of an adaptation M&E framework and provide support in identifying an adaptation-focused theory of change and logic frame.
Pícon, D., 2018. USAID Design and Planning for Resilience M&E at the Activity Level	Provides guidance on creating a resilience-focused results framework. The USAID framework includes resilience capacities and an examination of responses to shocks and stresses that is useful for explaining how resilience themes differ from traditional results chains.
Vaughan, 2018. Resilience Measurement Practical Guidance Note Series 3: Resilience Capacity Measurement	Guidance on assessment of capacity in government, specifically related to resilience, but approach is applicable to adaptation and other topics.
Planning Stage (Purpose, Approach, Institutional Structure)	
Bours et al., 2014. Guidance note 3: Theory of Change	Provides in-depth adaptation-relevant guidance on developing a theory of change.
Brooks and Fisher, 2014. Tracking Adaptation and Measuring Development: a step-by-step guide	A generic framework for establishing a national M&E approach. Provides detailed information on creating a theory of change for adaptation, analyzing capacity of government agencies or change and an in-depth look at developing indicators.
Brown, 2016. USAID Learning Lab blog post on theory of change	Presents the components and process for creating a theory of change, and links to other resources for deeper learning on the concept.
USAID, 2018c. Collaboration Mapping	A mapping tool that helps users identify key stakeholders, their level and type of interaction and influence with each other, and visually maps the results.
USAID MEASURE Evaluation PIMA, 2017. The Monitoring and Evaluation Capacity Assessment Toolkit (MECAT) (pg. 13)	Tools to assess M&E capacity in government institutions, identify gaps, and plan ways to strengthen M&E systems.

Project-level M&E	
GIZ, 2016. MACC Tool -Monitoring Adaptation to Climate Change for Projects	An Excel-based tool that walks users through a step-by-step process for creating a project-level M&E plan for adaptation actions. It may be useful for sector-level city government staff who are looking to design project-level M&E that is in line with a citywide adaptation M&E program.
Indicator Selection and Development	
Christiansen et al., 2016. Monitoring & Evaluation for Climate Change Adaptation: A summary of key challenges and emerging practice (pp. 7–9)	Details baseline issues, explains the concept of a “shifting” or dynamic baseline and makes suggestions for best practice in establishing a dynamic baseline.
Clean Air Partnership, 2015. Are we there yet? Applying Sustainability Indicators to Measure Progress on Adaptation	Provides a case study approach to presenting sample indicators, The case studies cover process and outcome-based indicators to measure sustainability in four sectors: coastal management, flood management, infrastructure and health.
GIZ, 2014. Repository of Adaptation Indicators	A large repository of indicators for national adaptation, but many are applicable to citywide or sector indicators
Mayors Adapt Office, 2016. Global Covenant of Mayors Adaptation Scorecard	Reporting guidelines and include a long list of sample indicators for vulnerability, outcome and impacts for adaptation
Reporting, Evaluation and Learning	
NYC, 2018. OneNYC 2018 Progress Report	OneNYC is New York City’s climate action plan for mitigation and adaptation. The city reports on progress yearly with detailed data-driven reporting supplemented by qualitative stories that connect readers with the experience of New York residents.
USAID PPL, 2017. How-To Note: Project Monitoring, Evaluation and Learning Plan	Provides guidance on how to collect, manage and store data for indicators on USAID projects.
USAID, 2015. USAID Evaluation Toolkit	Provides a more in-depth look at USAID-specific evaluation processes and includes good examples of best practice in evaluations and necessary steps.
DFID-BRACED, 2015. BRACED Programme Monitoring & Evaluation (M&E) Guidance Notes	Presents the concept of evaluative monitoring and provides best practice examples of how to conduct it on development projects.
Pringle et al., 2011. AdaptME toolkit: Adaptation Monitoring & Evaluation	Focuses on evaluation of adaptation actions and provides a helpful review of the link between evaluation and learning and some best practice in adaptation learning (beginning on p. 7).

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