DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

SUPPORTING PARTNER

Cities Alliance
Cities Without Slums

IMPLEMENTING PARTNERS

ICLEI Local Governments for Sustainability

C40 CITIES

PIONEERED BY THE ROCKEFELLER FOUNDATION
100 RESILIENT CITIES

UN HABITAT
FOR A BETTER URBAN FUTURE

sdi.

DONORS & PARTNERS

The publication is part of a collaborative partnership under Cities Alliance's Joint Work Programme (JWP) on Resilient Cities in the framework of a project entitled: *"Implementing Paris and SDG#11 in Global South Cities: The case for urban resilience and adaptation to climate change"*.

About ICLEI

ICLEI is the leading global network of 1,500+ cities, towns and regions committed to building a sustainable future. Through our collective efforts, we impact more than 25 percent of the global urban population. Read more: www.iclei.org

About C40

C40 is a network of over 90 of the world's megacities committed to addressing climate change. C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. Read more: www.c40.org

About the Joint Work Programme (JWP) on Resilient Cities

Launched at COP21 in December 2015 in partnership with the Medellin Collaboration on Urban Resilience (MCUR), the JWP is a multi-year program that brings Cities Alliance members and partners together to promote resilient, inclusive, resource-efficient urban planning. In keeping with the mission of Cities Alliance, the JWP focuses specifically on addressing the resilience challenges of informal settlements and the working urban poor. Read more: www.citiesalliance.org/JWP-ResilientCities

PUBLISHER

ICLEI – Local Governments for Sustainability e.V.

Kaiser-Friedrich-Strasse 7
53113 Bonn, Germany

www.iclei.org

AUTHOR

Evgenia Mitroliou, ICLEI - Local Governments for Sustainability

CONTRIBUTORS

From ICLEI: Guilherme Johnston, Maryke van Staden, Chang Deng-Beck
With contributions from: C40, UN-Habitat, Slum Dwellers International (SDI), and 100 Resilient Cities (100 RC)

LAYOUT & GRAPHICS

Angelo Ngugi Becker and Matteo Franceschi

DISCLAIMERS

The information contained in this publication is based on self-reported largely non-verified data which has undergone a basic quality check, as reported to the carbon*n*® Climate Registry (cCR) and CDP. Individual profiles of the reporting entities are available at www.carbonn.org/data and www.cdp.net

This report is a snapshot in time. For current data, visit carbonn.org, www.cdp.net or contact carbonn@iclei.org

This publication should be cited as: ICLEI, C40 (2018), *Data speak louder than words: Findings from an initial stocktake of climate change adaptation and urban resilience efforts.*

01

INTRODUCTION

Ho Chi Minh City, Vietnam
Image released under CC0

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

In 2015, nations reached a historic global agreement on climate change and made first commitments through the Nationally Determined Contributions (NDCs) which outline their climate action ambition, addressing both climate change mitigation (or low emission development) and adaptation to climate change. However, despite commendable efforts, a sizeable gap still remains between what has been pledged and what is still needed to keep global warming at 1.5 degrees Celsius compared to pre-industrial levels. At the same time, several regions are already experiencing the effects of climate change manifested in the form of increased and unpredictable climate shocks and stresses, such as floods, wildfires, droughts, and tropical storms. Cities and regions worldwide are at the frontline of climate change impacts, with local communities increasingly undertaking targeted measures to adapt to current changes and enhance their resilience to future impacts.

Local and regional governments are identified as key stakeholders in the Paris Agreement, and are squarely at the heart of other major global frameworks of 2015 and 2016, including the Sendai Framework, the New Urban Agenda, and the 2030 Agenda. Therefore, there is need to integrate local and regional with national efforts to achieve our common goals for a livable, safe, resilient, and sustainable future. In a rapidly urbanizing world, nations could shape and implement more ambitious policies and plans, basing these on a clear understanding of local needs, then to be implemented at the local level – where progress may already be underway.

Resilient urban development cannot be reached or sustained in the framework of disparate actions and strategies. Rather integrated, inclusive, and well-thought-out approaches stand a better chance to tackle the complex problems faced in cities, now and in the future. Such approaches could be conveyed as integrated climate change mitigation and adaptation strategies with layered national-regional-local priorities. They could also be embedded in national sustainability roadmaps with incorporated detailed climate action plans for all government levels. This integration approach might still seem like a new idea at the global level, but in fact, at the local level, local and regional governments in their cities and regions have long been intuitively practicing such holistic ways of working. Urban systems are intrinsically interconnected and usually explicable as a whole rather than their individual components. For example, when a city intends to improve its waste management to mitigate flood disasters, its actions are often naturally intertwined with the water bureau, the food committee, and/or the public health system. The vision and process of attaining the 2030 Agenda has in various ways and contexts already begun at the local level. Though local leaders might not explicitly "*strive to achieve the SDGs*" they do strive to *"protect their constituents from risk"* or transform their jurisdiction into *"a green, prosperous, livable city"*.

Several local and regional governments have already set out to understand their climate risks and vulnerabilities, also to build sustainable and resilient solutions for the communities they serve. Many are found on a spectrum of sustainable, green and livable, safe and resilient, inclusive societies. However, there are still major obstacles – existing and evolving – to overcome in urban centers of the Global South. These cities and regions deal with increasing climate change impacts, while at the same time tackle a multitude of inherent problems, such as socio-economic disparities, slum housing, poverty, disease prevalence, rapid demographic changes and uncontrolled urbanization, with huge growing demand for basic services.

"Though local leaders might not explicitly strive to achieve the SDGs they do strive to protect their constituents from risk or transform their jurisdiction into a green, prosperous, livable city.

01

INTRODUCTION

As part of collective visions and efforts under the Cities Alliance Joint Work Programme (JWP) on Resilient Cities, ICLEI and C40, have joined forces in 2017 to deliver a project entitled: "*Implementing Paris and SDG#11 in Global South Cities: The case for urban resilience and adaptation to climate change*" with the support of UN-Habitat, Slum Dwellers International, and 100 Resilient Cities. The project, funded by the JWP, applies the new C40 "*Adaptation Diplomacy*" approach, which aims to support urban areas particularly in the Global South to overcome barriers and accelerate climate change adaptation action. With a clear pro-poor lens, the project aims to raise the profile of local climate leadership in the global agendas and help unlock the necessary resources to drive urban climate resilience. A key deliverable of this joint endeavor is to deliver this present knowledge product, which provides a baseline assessment on existing climate resilience and adaptation actions and action plans.

The findings in this report are meant to give voice to cities and regions in the important 2018 national stocktaking exercises on climate change and sustainable development. Such information, in the form of data generated by and for cities, "speaks for itself" when it comes to building a solid "*adaptation diplomacy*" message at key events, such as the High-Level Political Forum (New York, July 2018), the Global Climate Action Summit (San Francisco, September 2018), and the 24th Conference of the Parties to the UNFCCC (COP24) (Katowice, December 2018).

Apart from influencing global policy making, this report is meant to be an actionable document that supports knowledge advancement on adaptation and strengthens efforts in urban climate resilience planning. As such, it targets local and regional governments with the aim to enhance understanding of planning, implementing, measuring, and reporting on climate change adaptation. Though the data used and contained in this document is a snapshot in time, the assessment of the status of climate adaptation and resilience locally also provides a window into the often-overlooked adaptation efforts of local and regional governments. In addition, real case studies provide solutions to close existing gaps and harness opportunities in building climate resilience.

The evidence presented in this report constitutes a clear and loud call for action appealing to all levels of government. At the national and international level, the necessity to integrate efforts and amplify climate adaptation action on a truly global scale (meaning in local communities, led by local, regional, and national governments, and engaging with international agencies and other key actors) is highlighted.

"The evidence presented in this report constitutes a clear and loud call for action appealing to all levels of government.

At the local level, the findings of this initial assessment calls for regular updates on local adaptation progress as we approach the stocktake of 2020 when new or updated NDCs are expected to be submitted and the Global Stocktake process is defined. Most importantly, the ambition of this document is to activate the necessary awareness, modalities for support, and resources for cities and regions around the world to further commit, plan, implement, monitor, evaluate, and report their climate actions, including adaptation efforts.

Cityscape of Nairobi, Kenya
Image released under CC0

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

1.1 Glossary of terms

Adaptation (climate change) is the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.[1]

Adaptive capacity is the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.[2]

Climate adaptation plan is a plan that outlines the intended alterations to the city's systems in response to actual or anticipated climate change. It should cover the services and departments directly managed by the city government and may also consider the actions required by other stakeholders. The aim of such a plan is to moderate harm or exploit beneficial opportunities from expected climate change and its effects.[3]

Climate change impacts are effects of extreme weather and climate events and of climate change on human and natural systems. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system.[4]

Climate change vulnerability assessment is a qualitative and/or quantitative assessment of the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.[5]

Climate compatible development is development that minimizes the harm caused by climate impacts, while maximizing the many human development opportunities presented by a low emission, more resilient, future.[6]

Climate risk management is defined as a systematic and coordinated process in which climate information is used to reduce the risks associated with climate variability and change, and to take advantage of opportunities, in order to improve the resilience of social, economic and environmental systems.[7]

Climate-resilient pathways are development trajectories that combine adaptation and mitigation to realize the goal of sustainable development. They can be seen as iterative, continually evolving processes for managing change within complex systems.[8]

Disaster is a severe alteration in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.[9]

Disaster risk management is the application of disaster risk reduction policies and strategies, to prevent new disaster risks, reduce existing

1. IPCC (2014), Annex II: Glossary, in: "*Climate Change 2014: Synthesis Report*"
2. Ibid
3. Ibid
4. Ibid
5. Ibid
6. CDKN (2010), *Policy Brief: Defining climate compatible development*
7. WMO, *Climate Risk Management*: www.wmo.int
8. Denton, et al., 2014: *Climate-resilient pathways: adaptation, mitigation, and sustainable development*
9. IPCC (2014), Annex II: Glossary, in: "*Climate Change 2014: Synthesis Report*"

disaster risks, and manage residual risks, contributing to the strengthening of resilience and reduction of losses.[10]

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.[11]

Global South the term "*South*" or "*Global South*" refers to developing countries, which are located primarily in the Southern Hemisphere. The Global South includes Asia (with the exception of Japan, Hong Kong, Macau, Singapore, South Korea and Taiwan), Central and South America, Mexico, Africa, and the Middle East (with the exception of Israel).[12]

Hazard is the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In this report, the term hazard usually refers to climate-related physical events or trends or their physical impacts.[13]

Maladaptation are actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change, or diminished welfare, now or in the future.[14]

Mitigation (of climate change) is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs).[15]

Resilience is the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.[16]

Resilience strategy is a tactical roadmap to build resilience in the city. The strategy articulates the city's resilience priorities and specific initiatives for short-, medium-, and long-term implementation.[17]

Return on investment (RoI) measures the gain or loss generated on an investment relative to the amount of money invested. ROI is usually expressed as a percentage and is typically used for personal financial decisions, to compare a company's profitability or to compare the efficiency of different investments.[18]

Risk is defined as a function of the likelihood/probability of a shock or stress combined with the consequence of the shock or stress.[19]

Vulnerability is the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.[20]

10. United Nations Office for Disaster Risk Reduction (UNISDR), *Terminology*: www.preventionweb.net/terminology
11. Ibid
12. United Nations Office for South-South Cooperation (UNOSSC), *What is South-South cooperation?* www.arab-ecis.unsouthsouth.org/about/what-is-south-south-cooperation
13. IPCC (2014), Annex II: Glossary, in: "*Climate Change 2014: Synthesis Report*"
14. Ibid
15. Ibid
16. Ibid
17. ResilienceTools.org, *Terminology*: resiliencetools.org
18. Merriam Webster dictionary: www.merriam-webster.com/dictionary/ROI
19. United Nations Human Settlements Programme (UN-Habitat) (2015), *Local Governments' Pocket Guide to Resilience*
20. IPCC (2014), Annex II: Glossary, in: "*Climate Change 2014: Synthesis Report*"

1.2 A guide to this publication

This document provides a snapshot of the climate change adaptation targets, actions, and action plans of local and regional governments publicly reported on one of the most widely used subnational climate action reporting systems in the world, the carbonn® Climate Registry (cCR), managed by ICLEI. A qualitative and quantitative analysis of the data available was conducted and supplemented by relevant information during in-person consultation at key events, such as the Global Climate Action Summit (GCAS); a C40 regional policy dialogue in Accra; the ICLEI 2018 World Congress; and the Resilient Cities 2018 forum. Data provided in the newly released *Global Covenant of Mayors 2018 Global Aggregation Report*, which intersect and overlap with data reported on cCR, corroborate the key messages contained in this publication.[21] Finally, case studies from city-reported data on cCR and CDP, as well as programs, such as the 100 Resilient Cities, UN-Habitat's City Resilience Profiling Programme (CRPP), and the Slum Dwellers International' *Know Your City Campaign*, showcase progress on climate resilience in cities of the Global South.

Since 2016, local and regional governments are able to submit their climate plans and qualitative data on climate actions though the enhanced adaptation reporting section, i.e. the *"Climate Risk and Adaptation Framework and Taxonomy"* (CRAFT) questionnaire. Developed for the Compact of Mayors (now *Global Covenant of Mayors for Climate & Energy/ GCoM*), CRAFT is already incorporated in the cCR and the CDP platforms. All local governments are invited to report using CRAFT. All GCoM committed cities have agreed to report their climate risk and adaptation information via this standardized form, which is part of the GCoM common reporting framework – to be launched in early 2019.[22]

The research particularly zooms in on urban centers in the Global South to pinpoint their adaptation efforts thus far, local conditions in the way of implementation, and solutions to overcome such obstacles and build resilience in parts of the world where it is most urgently needed.
The report has three main objectives.

> *"The research particularly zooms in on urban centers in the Global South.*

Firstly, it provides a baseline of adaptation progress made at the local and regional level. It demonstrates the type of information and resources already available to support achieving national climate commitments and implement plans. The data research concludes that enhanced coordination and integrated approaches to adaptation planning, implementation, as well as an integrated Measuring, Reporting, Verifying (MRV) system are needed to amplify collective efforts to adapt to climate change, steer clear of avoidable loss and damage due to climate-induced disasters, and build community resilience while advancing on the global sustainability agenda.

Secondly, it points to existing and persisting disadvantages and obstacles faced by local and regional governments – particularly in the Global South – when it comes to dealing with climate change impacts and striving to attain development goals. In such a way, following the *Talanoa Dialogue* spirit[23] (see page 15), this research brings forth the voices of often marginalized stakeholders. This visibility could enable that these voices can be part of the 2018 international stocktaking on climate change and sustainable development.

21. GCoM (2018), Implementing Climate Ambition: Global Covenant of Mayors 2018 Global Aggregation Report
22. www.globalcovenantofmayors.org
23.UN Climate Change, Talanoa Dialogue Platform: talanoadialogue.com

Lastly, it attempts to answer how to overcome the aforementioned barriers to enable local and regional governments to fulfill their mandate to protect their citizens against the impacts of climate change. The research argues for enhancing efforts to close the gap of knowledge, capacity, and finance at the local and regional level and creating a true multilevel climate governance system, whereby national, subnational (local and regional), and community stakeholders have equal footing in decisions and measures that affect our common future.

This research report is organized in such a way to respond to those three aims while presenting a clear evidence-based picture of local and regional governments' progress in adaptation planning, implementation, monitoring, and reporting.

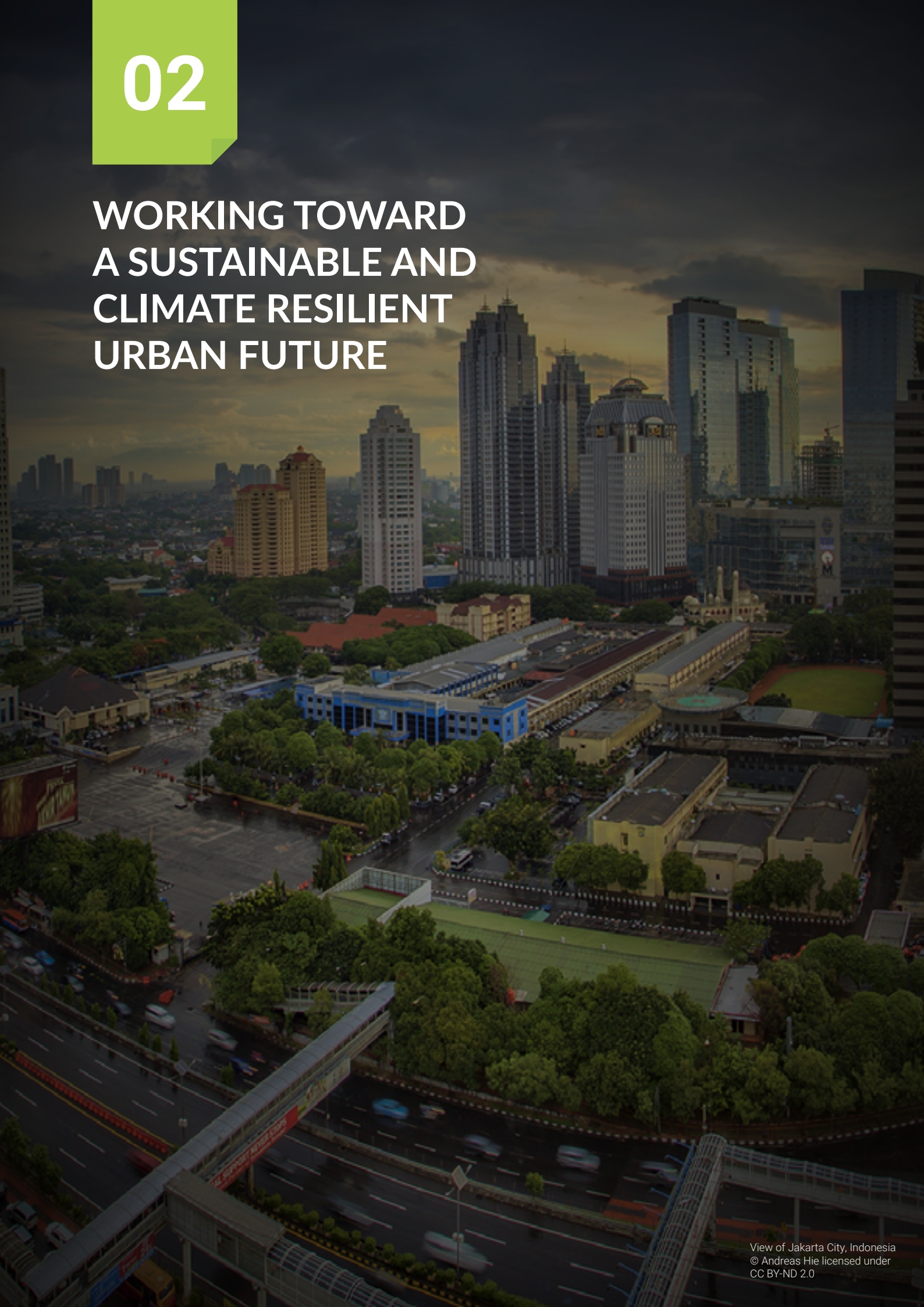
DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

Lumpini Park in the heart of the Thai capital Bangkok
Image released under CC0

02

WORKING TOWARD A SUSTAINABLE AND CLIMATE RESILIENT URBAN FUTURE



View of Jakarta City, Indonesia

2.1 Setting the scene: The Global Frameworks of 2015 and where we are now

2015 was the year the global community agreed on priorities and on collaborative, multi-level approaches to achieve a sustainable, resilient, prosperous, and inclusive future for all.

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework), adopted in March 2015, launched the year of global optimism. The Sendai Framework shifted the focus from managing disaster after disaster, toward proactive disaster risk reduction approaches. With the aim to reduce the loss of lives, economic disruptions, and damage to critical assets globally, the Sendai Framework created a "baseline" for human survival and its targets were naturally absorbed by the subsequent greater international endeavor of creating the Sustainable Development Goals (SDGs).

Adopted in September 2015, the 2030 Agenda and its interconnected 17 SDGs were launched to address the global challenges humanity faces, including poverty, climate impacts, health, peace and justice by year 2030. Goal 11 to make cities and human settlements "*inclusive, safe, resilient, and sustainable*" recognized local and regional governments as stakeholders and contributors. It sets targets for the achievement of this vision with their support. The resilience targets of the SDGs[24] incorporate the seven targets of the Sendai Framework[25] – a useful first step toward coherence of global frameworks.

On December 2015, the landmark Paris Agreement was adopted. The Paris Agreement set a clear goal: To keep the global temperature rise well below 2 Degrees Celsius (°C) above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Under the Paris Agreement, nations also agree to a long-term global goal on adaptation of *"enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal […]"* (Article 7, Paris Agreement, United Nations, 2015).

In June 2017, the "*transformational optimism*" that accompanied the international climate agenda for two years was curbed when the United States federal government announced its intention to pull out of the Paris Agreement. However, this decision spurred an impressive coalition of different (non-federal) stakeholders in the United States and around the world to amplify their actions in terms of mitigation and adaptation. Local and regional governments, businesses, academic and tribal leaders declared unceasing efforts and ambitions to achieve climate resilience and carbon neutrality.

2.2 The importance of sustainability and climate resilience at the local level

According to latest UN figures, already in 2018 half of humanity resides in urban areas, a proportion that is projected to increase to 68% by 2050 and almost 90% of this growth is expected to take place in Asia and Africa.[26] Cities and conurbations today host a world of contradictions: They are at the same time hubs of economic opportunity and climate risk; agglomerations of population and cultural centers; sources of carbon

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

24. United Nations, About the Sustainable Development Goals: www.un.org/sustainabledevelopment/sustainable-development-goals

25. United Nations Office for Disaster Risk Reduction (UNISDR), Sendai Framework for Disaster Risk Reduction: www.unisdr.org/we/coordinate/sendai-framework

26. United Nations Department of Economic & Social Affairs (2018), 2018 Revision of World Urbanization Prospects: www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html

02

WORKING TOWARD A SUSTAINABLE AND CLIMATE RESILIENT URBAN FUTURE

emissions and birthplaces of social and technological innovation. Along the same vein, if the problem lies at the local and regional level, then the solution too lies therein.

Climate change adaptation, in particular, is considered inevitably a "local" matter. Since the challenges (hazards) are context-specific, the answers to increasing climate resilience and adaptive capacity in each community are also context-bound. The Paris Agreement stipulates that "*adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions, and that it is a key component of and makes a contribution to the long-term global response to climate change to protect people, livelihoods and ecosystems, taking into account the urgent and immediate needs of those developing country Parties that are particularly vulnerable to the adverse effects of climate change*" (Article 7, Paris Agreement, United Nations, 2015).

> *"Due to their geographic location, socio-economic and demographic conditions, the majority of cities and regions in the Global South are directly threatened by climate change.*

Due to their geographic location, socio-economic and demographic conditions, the majority of cities and regions in the Global South are directly threatened by climate change. This will be exacerbated if the world fails to keep global warming under 1.5°C. Many already feel severe consequences today. For those cities and regions, climate change migration and annual loss and damage due to increasing disasters is a reality. Adaptation may be the only way forward for the Global South cities and regions, many of which barely contribute to global greenhouse gas emissions. Urban communities in the Global South are yearning for holistic climate resilience/adaptation solutions to support their urgent needs, so they may progress on the sustainable development pathway. However, often the international community, media, civil society organizations and – most alarming – international donors solely focus on climate change mitigation. It is well understood that the more we mitigate the less we may need to adapt. Yet, already now adaptation is an urgent need. Targeted and tailored support is critical for the Global South's urban centers. Such support needs to be translated into capacity building and substantive mobilization of resources for the development and implementation of integrated climate action plans in the megacities, as well as the ever-increasing resource-poor and out-of-political-focus small and medium-sized cities in Asia, Africa, South America, and the Pacific.

As urban spaces continue to expand, their transformations and ways of coping with increasing shocks and stresses could make the difference for our planet. By building a world of sustainable cities and regions, humanity has a greater chance of achieving the global sustainable development agenda and thriving in the face of constant global changes. Through programs, tools, and capacity building initiatives, civil societies and local government networks are supporting cities, towns, and regions across the world (and in particular in the Global South) in reaching their full potential for sustainable urbanization. For example, ICLEI's five interconnected pathways[27] – low emission, nature-based, circular, resilient, and equitable – lay out a roadmap to jumpstart the necessary transformative action at the local level and scale up best practices globally.

27. ICLEI, Our approach: iclei.org/en/our_approach.html

2.3 The stocktaking exercises of 2018: Assessing progress made toward a better urban future

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

Three years on the sustainability pathway of the 2030 Agenda, the United Nations invited all relevant stakeholders, including national, regional, and local leaders, large private sector and investor groups, as well as civil society representatives for a multi-stakeholder stocktaking on progress-made toward achieving the SDGs at national, regional and local levels. The United Nations High-level Political Forum on Sustainable Development (HLPF) took place on July 2018 as part of an official review mechanism foreseen in the 2030 Agenda which encourages nations to: "*conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven. Such reviews should draw on contributions from indigenous peoples, civil society, the private sector and other stakeholders, in line with national circumstances, policies and priorities*" (paragraph 79).[28] These national reviews provide the foundation for regular stocktaking by the HLPF.

In 2018, the Forum's theme was "*Transformation towards sustainable and resilient societies*" and six out of seventeen SDGs were up for review: Water and sanitation for all (SDG 6); sustainable and modern energy for all (SDG 7); **cities and human settlements** (SDG 11); sustainable consumption and production patterns (SDG 12); sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG 15); and global partnership for sustainable development (SDG 17). The Forum concluded with the adoption of a Ministerial Declaration which recognizes "*the importance of effective and coordinated government, including at the subnational and local levels, as appropriate, as well as evidence-based policymaking and innovation-driven development underpinned by high-quality, timely, reliable and disaggregated data*."[29]

There is another reason why 2018 is an important year for all levels of government to question collectively "*where we are*". The Paris Agreement mandates all nations to undertake and communicate ambitious Nationally Determined Contributions (NDCs) to tackle the adverse impacts of climate change. Every 5 years, a global stocktake is expected to take place to assess the collective progress toward achieving the purpose of the Agreement. Based on that process, nations are expected to re-evaluate their targets and increase the levels of mitigation and adaptation ambition. It is implied that nations will track, report and increase their commitments over the years. The *Global Stocktake* officially begins in 2023 and is meant to result in revised (improved) NDCs by 2025. However, in 2018 the global community has the first chance to assess how their collective efforts measure up against the Paris goals. So in fact the stocktaking process started in 2018 as part of the official Facilitative Dialogue, known as *Talanoa Dialogue*. Established at the 23rd Conference of the Parties to the UNFCCC (COP23), under the inspired leadership of the Fijian COP Presidency, the *Talanoa Dialogue* invites nations and other stakeholders (including local and regional governments) to track and share their climate action progress in an inclusive and transparent process. The outcome of this initial global stocktake is to drive nations to submit NDCs by 2020 that reflect the vision and mission of the Paris Agreement.

Building upon the *Talanoa* spirit of inclusivity, local and regional governments spearheaded their own dialogues in support of the global

28. United Nations (2015), Transforming our World: The 2030 Agenda for Sustainable Development (A/RES/70/1)

29.United Nations (2018), Ministerial Declaration of the High-Level Segment of the 2018 Session of the Economic and Social Council and the High-Level Political Forum on Sustainable Development (E/HLS/2018/1)

02

WORKING TOWARD A SUSTAINABLE AND CLIMATE RESILIENT URBAN FUTURE

stocktaking and climate action decision-making process. Over 50 C*ities and Regions Talanoa Dialogues* were scheduled this year, the majority of which took place in the Global South. The outcomes from these events presented a wide range of transformative, inventive, and forward-looking local and regional solutions to reaching the Paris goals both on mitigation and adaptation. These learnings will be aggregated and publicly presented by COP24 in Katowice, Poland.

In the lead to COP24, the Global Climate Action Summit (GCAS) in September 2018 invited local and regional authorities, businesses, and community representatives from around the world to show their progress in meeting the global climate challenge and stimulate national ambition. The GCAS has inspired renewed commitments for climate action,[30] provided new knowledge on the short and long-term benefits of switching to low emission and resilient development pathways, and spurred action by providing updates on progress achieved to date. Through C40's *Deadline 2020 Initiative,*[31] 72 cities worldwide publicly committed to develop and begin to implement ambitious climate mitigation and adaptation action plans by 2020; while the *Global Covenant of Mayors 2018 Global Aggregation Report* provided an overview of advancement on local climate action, addressing both mitigation and adaptation.[32]

The present publication expands upon the findings of the *GCoM 2018 Global Aggregation Report* by offering a deep-dive analysis on adaptation and climate resilience at the local and regional level. In such a way, it contributes to the stocktaking of 2018 by garnering a baseline assessment of the existing adaptation and urban resilience actions and plans available today, evaluating the status of the adaptive capacity of cities and their surrounding regions, and highlighting the barriers that still remain in achieving sustainable and resilient urbanization globally – with a special focus on the additional challenges of Global South cities and their innovative solutions to overcome those.

30.C40, Press Release: www.c40.org/press_releases/scores-of-cities-commit-to-bold-climate-action-to-deliver-on-the-highest-ambition-of-paris-agreement

31.C40, Deadline 2020: How cities will get the job done: www.c40.org/other/deadline-2020

32.GCoM (2018), Implementing Climate Ambition: Global Covenant of Mayors 2018 Global Aggregation Report

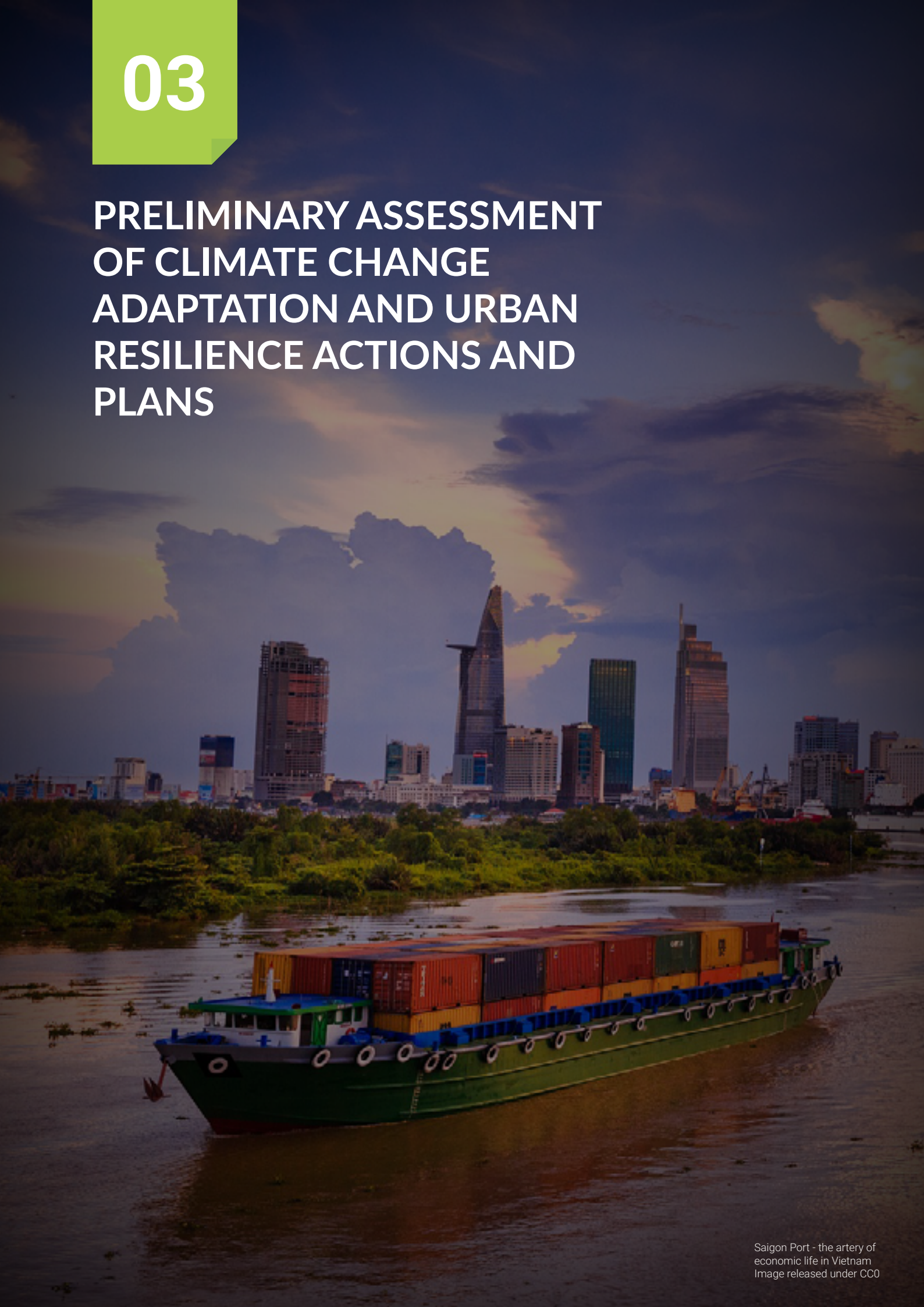
Daily life in a South Asian city
Image released under CC0

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

03

PRELIMINARY ASSESSMENT OF CLIMATE CHANGE ADAPTATION AND URBAN RESILIENCE ACTIONS AND PLANS



Saigon Port - the artery of economic life in Vietnam
Image released under CC0

3.1 A snapshot of local and regional progress on adaptation worldwide

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

With **1,059** registered entities from **88** countries, representing **836** million inhabitants, the carbon*n*® Climate Registry (cCR)[33] is one of the most widely used reporting platforms in the world for cities, towns and regions. It provides a broad scope of self-reported data on local and regional climate action.

Since 2016, the cCR has incorporated a new expanded adaptation section. This standardized section was developed for the Compact of Mayors initiative. Within one year, all cities committed to the Compact of Mayors were required to report their climate risks and adaptation information via this new section, called CRAFT. The following presents (a) a summary of findings from data analysis of the new section, and (b) information on adaptation actions and action plans reported since 2011. Note that this is an update on the data included in the ICLEI publication Boosting subnational climate action through new climate governance.[34] New information contained in the section below includes data from November 2017 to October 2018. Data reported over this period provides a snapshot of local progress on adaptation and urban climate resilience planning. Key findings are presented below for informing action in climate change adaptation at all levels of government and furnishing clear, data-based, evidence-driven messages for adaptation diplomacy in major international processes of 2018.

295 local and regional governments (henceforth "*entities*") have reported to the adaptation section of the cCR within the mentioned timeframe.

3.2 Stage of progress in urban adaptation planning

A third of the entities have embarked on the course of urban adaptation planning by engaging in ***at least one*** of the following steps:

1. Identified a climate adaptation vision and began to mobilize resources;
2. Identified key stakeholders and developed ways of stakeholder engagement;
3. Conducted a climate risk or vulnerability assessment;
4. Set goals for adaptation actions and prioritized these;
5. Identified and assessed options for adaptation actions

In contrast, ***cumulatively***, only one fifth of the reporting governments (21%) is taking or is in the process of taking ***all*** steps 1 to 5. While 5% are currently not undertaking, not planning to undertake, or do not know if they are undertaking steps 1 to 5 (or have not reported this if they did). A smaller percentage is recorded for "advanced steps" in adaptation planning, such as:

6. Developed adaptation plan and identified implementation tools;
7. Implemented actions from the adaptation plan;
8. Measured progress of adaptation actions;
9. Updated adaptation plan accordingly.

In fact, ***cumulatively*** not more than 9% of entities have completed or are in the process of taking all steps 6 to 9.

33.Data from the carbon*n*® Climate Registry (cCR)*

34.ICLEI (2017), Boosting subnational climate action through new climate governance

03

PRELIMINARY STOCKTAKE OF CLIMATE CHANGE ADAPTATION AND URBAN RESILIENCE ACTIONS AND PLANS

STAGE OF PROGRESS IN URBAN ADAPTATION PLANNING

Figure 1 illustrates the stages of urban adaptation planning globally, from starting the political commitment process to planning for climate adaptation and measuring success (steps 1-5 and 6-9 above).

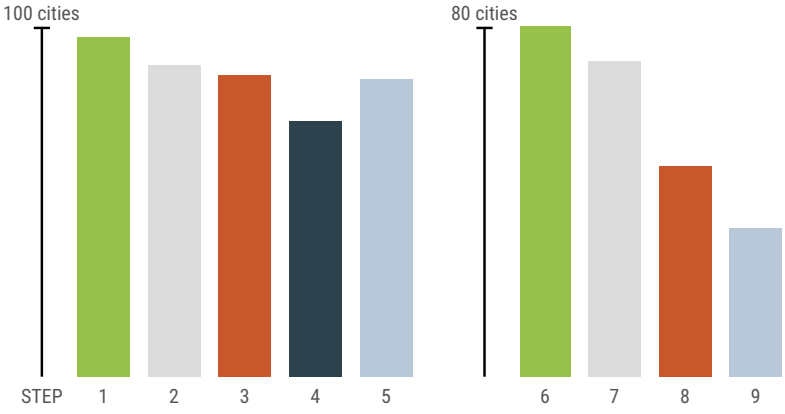


Fig 1: The graphic representation is based on data from reporting entities responding to the specific question/section in the reporting sheet associated with the title of the illustration.

Understanding risk and vulnerability within an urban area is an essential stepping stone upon which local governments build informed adaptation action.

More than half (58%) of the entities reporting to the adaptation section of the cCR have completed or are developing a climate risk or vulnerability assessment, while 19% do not have or are not making provisions for such a step in the reporting period.

SCOPE OF CLIMATE RISK VULNERABILITY ASSESSMENT

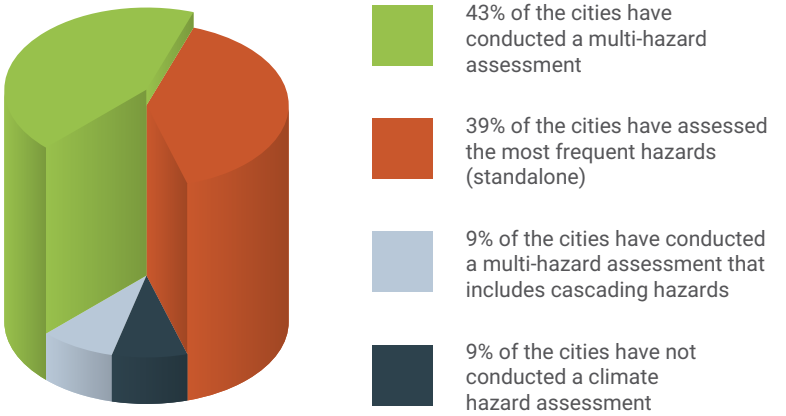


Fig 2: Illustrates the scope of climate risk or vulnerability assessment indicating the level of detail or complexity of such a process vis-à-vis hazards affecting the urban area.

A small minority of reporting entities has not yet conducted a climate hazard assessment or has, on the contrary conducted a sophisticated multi-hazard assessment that includes cascading hazards. The latter implies that the city or region has considered the effects of multiple hazards on its jurisdiction and has analyzed how one hazard affects another (e.g. analyzing the correlation between floods and the prevalence of water-borne diseases).

3.3 Current and future climate hazards

139 entities reported in the hazards section, which requires respondents to identify from a list of 36 (see Annex I) of the most important city climate hazards currently faced by their jurisdiction. Further they are asked to define how they expect climate change to affect these hazards in the future. Entities are also asked to describe the impact of hazards on city assets and services.

Hazards reported by entities as having a "*high probability*" (likelihood) and "*high consequence*" (magnitude) of bearing an impact, are considered "*high risk*". This means that such hazards are expected to have greater than 1 in 2 chance of occurrence over the next five years and, should they occur, they would result in serious impacts and catastrophic disruptions to the city or region.

The **top 6 climate hazards** reported globally as being high risk in cities and regions are:

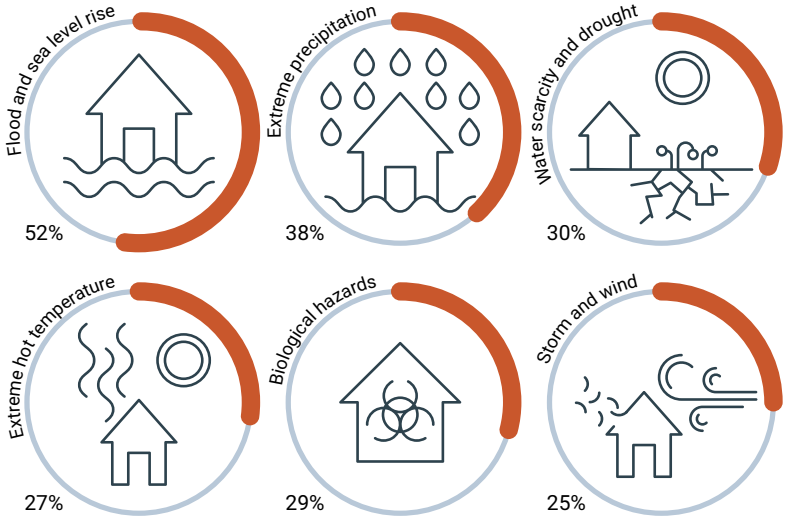
1. **Flood and sea level rise**, including coastal, river, groundwater and flash/surface flood
2. **Extreme precipitation**, including rainstorm, monsoon, and hail
3. **Water scarcity and drought**
4. **Extreme hot temperature**, including heatwave and extreme hot days
5. **Biological hazards**, including vector-borne and water-borne diseases
6. **Storm and wind**, including cyclone (hurricane/typhoon) and tornado

Following these high-priority hazards, reporting entities indicated as "highly to occur" with severe consequences the following climate hazards:

7. **Mass movement**, including landslides and subsidence
8. **Wild fire**
9. **Chemical change**, including saltwater intrusion
10. **Insect infestation**
11. **Extreme cold temperature**

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts



TOP 6 CLIMATE HAZARDS (HIGH RISK)

Fig 3: Top climate hazards affecting entities by percentages

03

PRELIMINARY STOCKTAKE OF CLIMATE CHANGE ADAPTATION AND URBAN RESILIENCE ACTIONS AND PLANS

Climate hazards could have a particularly precarious impact on cities and regions in the Global South that are already struggling with pre-existing demographic, economic, environmental, social, or political stressors. In fact, the vast majority (over 80%) of respondents concerned with the top 6 high risk hazards described above are Global South cities (see Figure 4). In addition, often hazards with high probability of occurrence, but medium high/medium consequence could be equally detrimental to Global South cities, as they live under the constant risk of a disaster event. Over two thirds (68%) of the respondents concerned with such "moderate" hazards are from the Global South. Cities such as ***Bogor in Indonesia*** (locally known as the "*Rain City*" (*Kota Hujan*) due to the prevalence of rain) invest significant effort and resources into disaster risk management measures to protect themselves from the imminent impact of rain storms and flooding.

DISTRIBUTION OF HAZARDS IDENTIFIED BY REPORTING CITIES GLOBAL SOUTH/NORTH

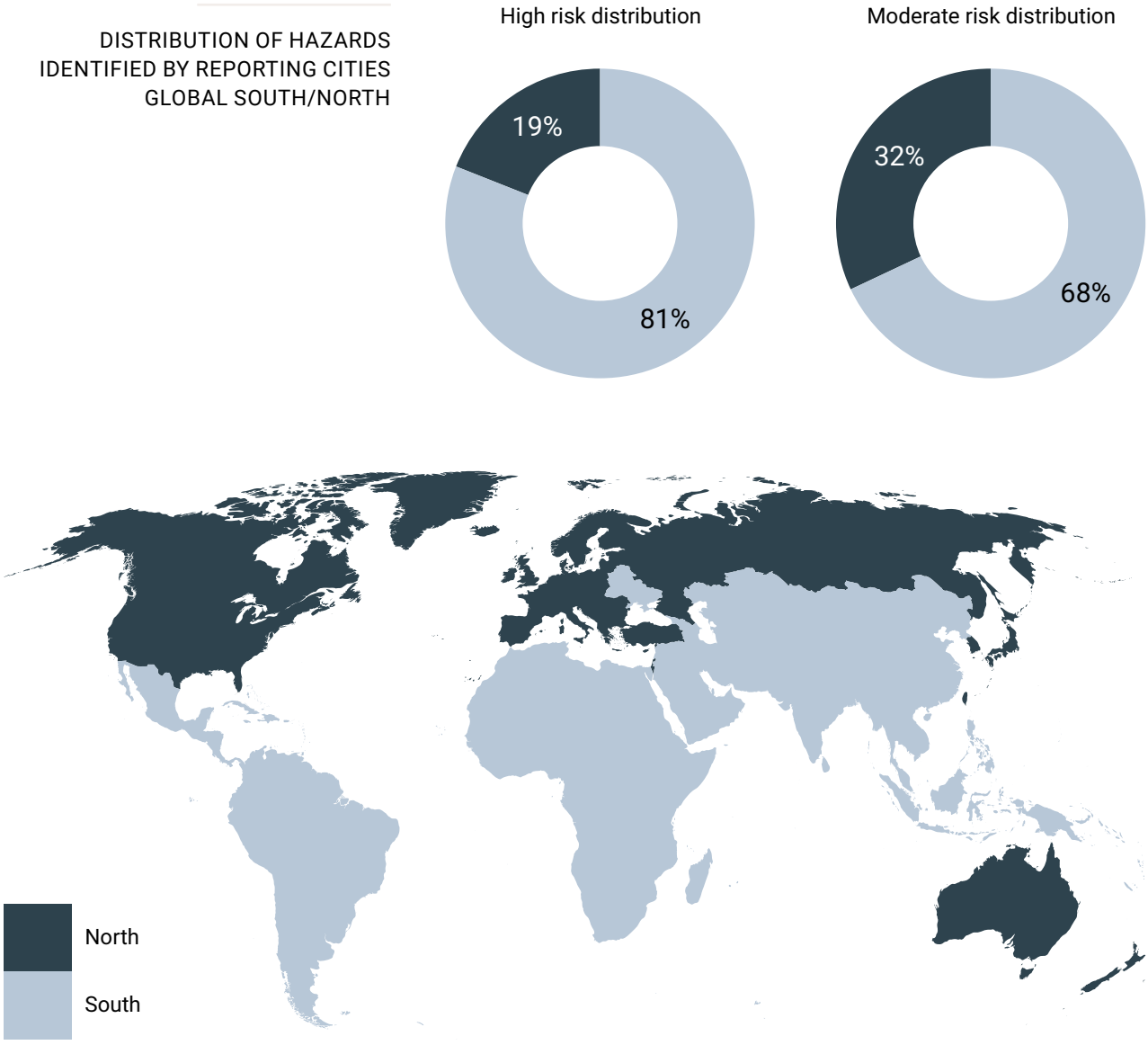


Fig 4: Distribution of hazards across regions: Global South light blue vs. Global North dark blue. The graphic representation is based on data from reporting entities responding to the specific question/section in the reporting sheet associated with the title of the illustration.

Looking ahead, the vast majority of reporting entities (79%) expect hazards to increase in intensity and frequency in the future. Reporting entities expect the same top 6 climate hazards (see above) to increase both in frequency and intensity in the short and long-term future.

For cities and regions in the Global South, the ***frequency*** of hazards might play the decisive role in terms of impact. The cumulative effect of subsequent (or even overlapping) periods of smaller-scale disasters prevent communities from fully recovering from one event before the next one hits. Such protracted emergency conditions, keep local governments from achieving their resilience and sustainability vision and end up prolonging the poverty cycle.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

Snapshot of a Chinese city life
Image released under CC0

3.4 Assets and services affected by climate change

Food and agriculture, public health, and energy are the assets and services most commonly affected by climate change impacts at the local level. With ***food and agriculture*** being the top asset affected in cities and regions of the Global South.

The majority of the respondents (88%) expect that their identified hazards will result in "extremely serious" or "serious" impacts for their jurisdiction. This means that these entities expect that already in the short term future (in some cases by 2025), hazards may significantly affect critical assets and result in economic and human losses.

In addition, the increase of extreme weather events could cause adverse ripple effects interconnected urban systems.[35] For example, when the power grid fails several urban assets and services suffer cascading failures, including transportation, telecommunications, and computerized systems.

Flood and sea level rise was indicated by respondents as the hazard most expected to increase in frequency (78% of respondents). Figure 5 is illustrating the distribution of this particular hazard in relation to the top 3 sectors expected to be impacted by reporting entities in various regions. The example of the Latin America & Caribbean region is in focus to illustrate the impact of flood & sea level rise in one of the fastest urbanizing regions of the world.[36]

35.C40 (2017), C40 Infrastructure Interdependencies and Climate Risks Report

36.UNDESA (2018), 2018 Revision of World Urbanization Prospects: www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html

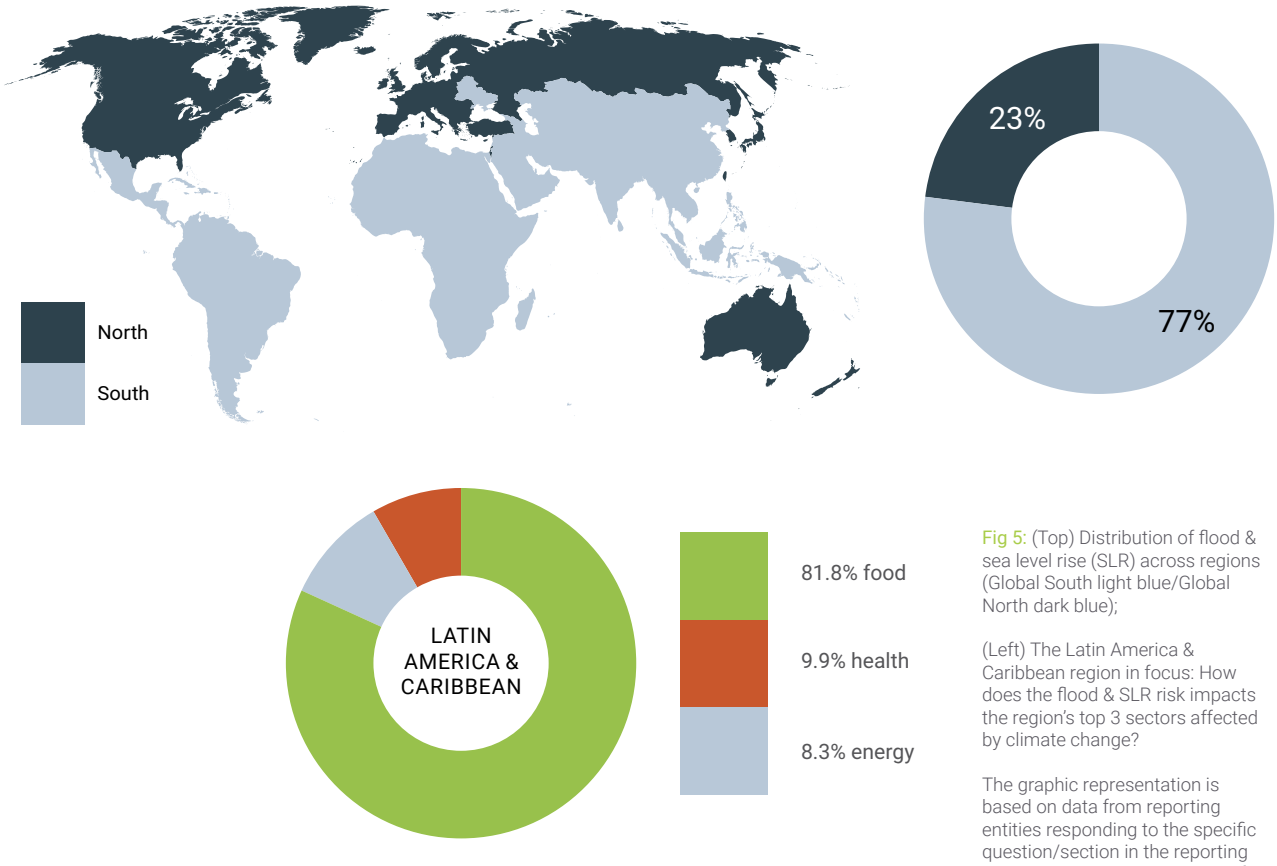


Fig 5: (Top) Distribution of flood & sea level rise (SLR) across regions (Global South light blue/Global North dark blue);

(Left) The Latin America & Caribbean region in focus: How does the flood & SLR risk impacts the region's top 3 sectors affected by climate change?

The graphic representation is based on data from reporting entities responding to the specific question/section in the reporting sheet associated with the title of the illustration.

3.5 Factors affecting adaptive capacity

160 reporting entities have responded to this specific section in the cCR, which required entities to identify conditions from a list of 26 non-exhaustive factors that influence their climate resilience efforts by either hindering or enabling climate adaptation actions within their jurisdiction.

Reporting entities identified the following as major factors that enhance their adaptive capacity:

- Political engagement / transparency
- Access to education
- Political stability
- Access to basic services
- Access to healthcare
- Community engagement
- Access to quality / relevant data

While these factors challenge their adaptive capacity:

- Poverty
- Housing
- Unemployment
- Migration
- Cost of living
- Rapid urbanization
- Environmental conditions

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

FACTORS THAT ENHANCE/ CHALLENGE ADAPTIVE CAPACITY

Fig 6: Factors that enhance versus factors that challenge cities and regions adaptive capacity

3.6 Barriers and opportunities presented as a result of local adaptation planning

Respondents in this adaptation section of the cCR are also asked if they can identify benefits or improvements as a result of their adaptation efforts (in addition to reduced climate risk), as well as existing barriers they still experience and solutions they foresee to overcoming these. The purpose of this section is to highlight any support needed by cities and regions in achieving climate resilience.
See case study below on barriers and opportunities identified by a reporting entity to the cCR.

Cape Town, South Africa
Photo by Tim Johnson on Unsplash

FEATURED CITY

Cape Town, South Africa

In Cape Town, South Africa – a metro area of over 4 million people with significant socioeconomic disparities – addressing climate change is as much political and economic as it is technical.[37] The impacts of climate change manifest in the form of drought, flood and sea level rise, and extreme precipitation (high risk), as well as extreme hot temperature, storm and wind, and wild fire ("moderate" risk).[38] These risks are currently experienced by the City and are projected to increase in frequency and intensity already in the short-term period (by 2025).

Adaptation-relevant policies and extensive measures to reduce risks and build adaptive capacity have therefore already commenced and attention on building a climate resilient Cape Town has progressively increased over the span of a decade. In 2006, the City's Mayoral Committee enshrined its adaptation vision in a document entitled: *"Framework for Adaptation to Climate Change in the City of Cape Town"*, which formed the basis for the development of its sectoral Climate Adaptation Plans of Action (CAPAs).[39] In addition, the City conducted a comprehensive disaster risk assessment (with climate change in focus) and sea level rise assessments.

Political coherence, the increase of climate adaptation awareness, and strategic partnerships have proven vital for the local government's adaptation efforts. Working closely with key national departments, civil society, research and academia, businesses, as well as the informal sector the City has obtained essential knowledge, tools, and capacity to identify and map risks and vulnerabilities, design adaptation actions, and foresee gaps and opportunities in its adaptation planning. The City is also focused on understanding the socio-economic impacts of climate change and envisions that such a process could be turned into an opportunity for sustainable development, as the local government rethinks and reworks its approach to poverty, inequality, and the informal sector.[40]

However, while climate risks continue to increase, the City hugely lacks the necessary resources to continue adaptation research, enable adaptation planning, and initiate actions at the scale necessary. Another limiting factor is retaining institutional knowledge in the face of frequent staff rotation[41] and investing in capacity building – as this "soft" adaptation measure is rarely funded by external financial partners.

37.City of Cape Town (2017), Climate Change Policy (Policy No. 46824): www.capetown.gov.za/Document-centre

38.Data from the carbonn® Climate Registry (cCR)

39.City of Cape Town (2017), Climate Change Policy (Policy No. 46824): www.capetown.gov.za/Document-centre

40.Ibid

41.Agence Française de Développement (AFD) (2014), Institutional Pathways for Local Climate Adaptation: www.afd.fr/en/institutional-pathways-local-climate-adaptation-comparison-three-south-african-municipalities

3.7 Adaptation actions & action plans

In response to increasing climate hazards, local and regional governments are working to address increased climate risk through integrated adaptation plans with actions that target vulnerable communities and sectors.

A total of **162 reporting entities (half of which or 54% from the Global South)** have reported that they have either "completed" or are "in progress" of completing their Climate Adaptation Plan (these are "climate adaptation/resilience plans" and "integrated climate plans").

A total of **2,046** "adaptation-relevant actions" ("adaptation actions" and "adaptation actions with secondary focus on low emission development/ mitigation") were reported.

From the "adaptation-relevant actions", 73% are already "under construction/set up" or "in operation", while 24% are "completed" and only 3% are in the "planning phase" (meaning looking for funding in order to be implemented).

However, to represent the entire picture, the latter figure has to be observed in conjunction with data illustrating the current source of funding for climate adaptation actions (see Figure 7 below). The combined data represent the current status quo, whereby more than half of all "adaptation relevant actions" are being financed or expect to be financed by **local funds (70%)**.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

SOURCE OF FUNDING AND STATUS OF ACTION

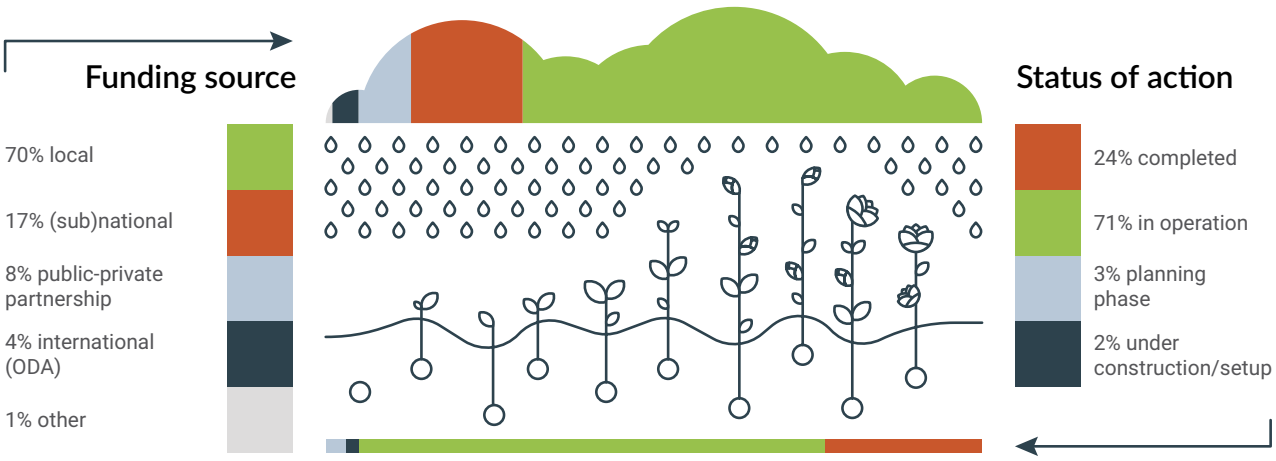


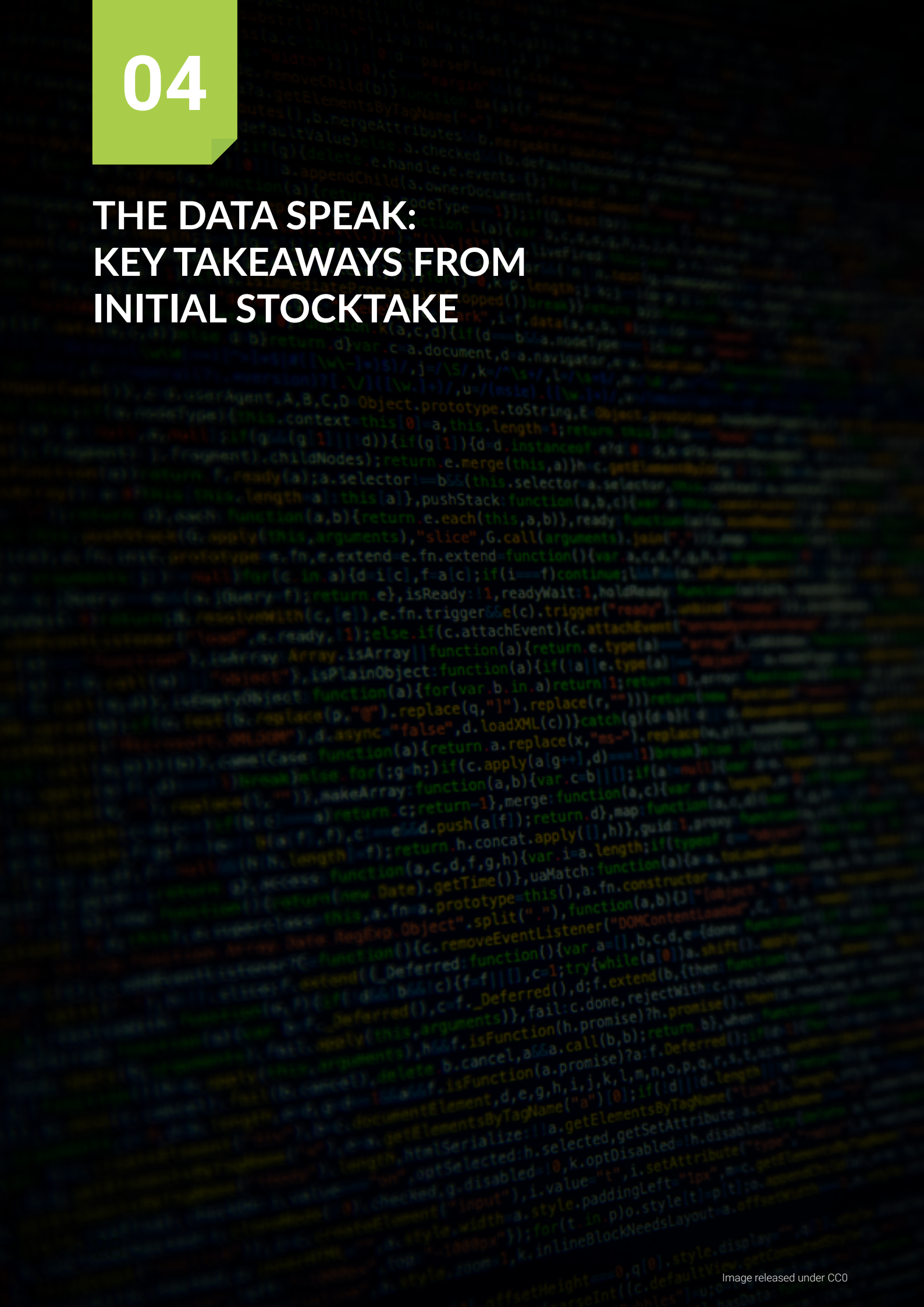
Fig 7: Status of actions (on the right) and the source of adaptation funding (on the left)

Over half of all reported actions (57%) have indicated ***human health*** as the adaptation sector relevant to their reported actions, while the top reported co-benefits from adaptation relevant actions are:

- Improving urban livelihoods
- Preserving/improving ecosystems and biodiversity
- Improving public health
- Improving urban air quality
- Supporting green urban economy

04

THE DATA SPEAK: KEY TAKEAWAYS FROM INITIAL STOCKTAKE



4.1 Building on progress made at the local level to enhance climate action

The stocktaking provides valuable information on the state of urban adaptation and climate resilience worldwide with a keen focus on the Global South and the measures taken by mega, as well as small and medium cities in Africa, South and Southeast Asia, and Latin America. It makes sense to review the adaptation progress at the local level, since the impact of climate change is felt locally, affecting different sectors, services, systems, and populations from one city to another. This indicates clearly that each urban area's exposure is unique and should therefore be assessed at the local level in order to create a viable defense against the impacts of climate change.

If there would be a single message coming from the figures presented extensively in the pages above is that there is already progress made at the subnational level in realizing a sustainable and resilient global urban future. Therefore, integration of action at all government levels is paramount in order to capitalize on hard-won successes at the local level and learn from inclusive, holistic approaches to solving the climate challenge of our times. But the pace of action is clearly too slow.

Data indicates that the lives of millions of urban dwellers, as well as critical city assets, services, and crucial city-region ecosystems are projected to be severely impacted by worsening floods, precipitation, storms, heatwaves, drought, and disease outbreaks. And though climate change is expected to affect communities and regions everywhere, its impacts are likely to disproportionately affect the poor, marginalized, and most vulnerable populations. Cities and regions in the Global South and Global North[42] are expected to experience differential impacts from similarly hazardous conditions. Within the Global South, disparities further trickle down to the city and community level. In Cape Town, South Africa, there's a difference in the way drought is experienced between "formal" and "informal" urban dwellers.[43] Marginalized groups – depending on local context – could include women, youth, elderly, sick, poor, or slum dwellers.

Local and regional governments have raised the ambition and undertaken robust climate action, but the collection of information, understanding of new incoming climate knowledge, and corresponding action is still in infancy. This holds especially true for urban areas in the Global South.

Nations are *obliged* to regularly submit (and accordingly adjust) their NDCs and also *encouraged* to formulate and implement National Adaptation Plans (NAPs). Where there are currently 12 NAPs submitted from developing countries,[44] there are already 162 climate adaptation/resilience plans or integrated climate plans available from cities and regions. This local knowledge, availability of local data, and experience in adaptation planning may complement the NAP process if integrated in the national efforts.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

42. United Nations Office for South-South Cooperation (UNOSSC): What is South-South cooperation? www.arab-ecis.unsouthsouth.org/about/what-is-south-south-cooperation

43. Data from the carbonn® Climate Registry (cCR)

44. As of October 2018

THE DATA SPEAK: KEY TAKEAWAYS FROM INITIAL STOCKTAKE

4.2 Learning from local level integration

Greater synergy (coherence) among the 2015 frameworks, their processes and even language, is urgently needed so as to ensure that impacts of climate change are tackled holistically at the "*first lines of response*" – i.e. the urban areas worldwide. Local governments around the world have already begun to contribute to the coherence requirement, by pursuing integrated urban development that is sustainable, resilient, and inclusive (see Global South case studies on pages 32-34). Multi-purpose solutions allow local governments to address the needs of several stakeholders and urban systems simultaneously with fewer resources. By leveraging co-benefits, they encourage innovation and yield greater social, environmental, and economic returns.

> *"...adaptation at the local level is dependent on far more than addressing climate risk exposure or climate vulnerability, but rather mutually supports and depends on progress on broader sustainability goals.*

Solidifying the argument for integrated urban approaches are the findings on the economic, social, environmental, and governance factors that enhance or challenge the adaptive capacity in cities and regions (see page 25). These show that progress on climate resilience and adaptation at the local level is dependent on far more than addressing climate risk exposure or climate vulnerability, but rather mutually supports and depends on progress on broader sustainability goals (e.g. reduction of poverty).

According to the Global Covenant of Mayors for Climate & Energy (GCoM), cities must have a plan that considers climate change adaptation *within 3 years* of joining the alliance.[45] This requirement follows the rationale by which cities would first craft a plan and subsequently undertake actions incorporated as part of the plan in the process to adapt to climate change. Though, as the initial stocktake has shown, there are disproportionately numerous actions in comparison to action plans (see page 27). This is due to the fact that oftentimes cities – especially in the Global South – needed to undertake urgent action to tackle climate change impacts ahead of outlining their longer term vision for actual or anticipated climate change.

For example, the Mozambican coastal ***Municipality of Quelimane*** has in recent years shifted from a narrow focus on economic development and poverty reduction to a more forward-thinking climate compatible development approach by which these aspects are naturally integrated into urban planning.[46] The Municipality has undertaken a series of actions, as part of a multi-year project supported by the United States Development Agency USAID, that seek to address multiple challenges and sustainability goals. By restoring its mangrove forests, the Municipality manages to simultaneously enhance its adaptive capacity to the risk of flood and sea level rise and provide economic opportunities for the poor and marginalized communities that are tasked to manage the tree seedlings.[47]

Pages 38-39 have further examples of cities' integrated approaches to achieving climate resilience and sustainability goals, while ensuring longevity of actions and plans by stimulating community ownership.

4.3 Existing barriers for cities and regions in the Global South to implement adaptation plans

The figures above show that more than half of the reporting entities have already started the process of developing adaptation plans and actions based on climate risk or vulnerability assessments. For the remaining half,

45. GCoM, Requirements: www.globalcovenantofmayors.org/participate/requirements

46. ICLEI (2018), Resilient Cities Report 2018

47. Ibid

however, such assessments do not exist due to lack of risk data at the local level, as well as capacity and/or access to tap into such information. Most cities and regions in our sample are in the earlier stages of measuring progress on climate resilience actions, indicating clearly that more support in conducting climate risk and vulnerability assessments and hazard mapping is required presently to boost local and regional level climate resilience action and avoid maladaptation.

From hazards mapping to formulating and implementing well-thought-out plans at the city level, substantial mobilization of resources is required to implement the vision for a sustainable urban future. Especially for urban areas in the Global South, the pure financial obstacle is enough to halt the process of integrated climate action and sustainable development.

Urban resilience and adaptation to climate change are smart investments, as disaster relief and recovery are far more expensive than disaster risk reduction measures.[48] Investments in prevention and preparation to an increasingly changing climate contribute to long-term social and economic development. Cities and regions see the benefit of such actions and continue to mobilize funding from their own (often) overburdened coffers, in absence of external sources. This may be attributed to difficulties in conceptualizing adaptation projects and identifying the associated benefits.

In addition, national regulations compound the challenges cities face and oftentimes widen the gap of financing for city climate action (climate change adaptation and mitigation). In general, the transfer and management of funds are subject to national level approval and control.

Climate change impacts are particularly exacting on Global South cities. Next to lack of financial resources, these areas often lack accurate and actionable data and knowledge to begin climate change adaptation efforts. In our technological age, there is a wealth of available information, but information on its own does not translate to *knowledge*. Access to tools and scalable data, as well as contextualized support and curated information is required to guide local decision-making and future scenario planning in the fast-growing and resource-constrained cities of the Global South (see Annex II for two Global South City Profiles from UN-Habitat's City Resilience Profiling Programme).

4.4 In focus: Global South cities and regions' adaptation efforts to date

As Figure 4 on page 22 has shown, the Global South is particularly impacted by climate hazards. Several cities already experience extreme climate change impacts on many crucial city assets and services.

The featured cities below, illustrate the key takeaway messages from the data analysis and provide examples of (a) how adaptation progress made at the local level in the Global South supports adaptation efforts at the national, regional, and even international level (vertical integration); (b) how cities already practice integrated approaches that could serve as examples for other levels of government – by serving as champions and propelling ambitious climate action; and (c) how cities overcome financing barriers to further their vision for adaptation.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

> *"Cities and regions continue to mobilize funding from their own (often) overburdened coffers...*

48. Price, R. (2018). Cost-effectiveness of disaster risk reduction and adaptation to climate change. K4D Helpdesk Report.

04

THE DATA SPEAK: KEY TAKEAWAYS FROM INITIAL STOCKTAKE

Quezon City, Philippines
Quezon Memorial Circle, national park located in the heart of the City
Image released under CC0

VERTICAL INTEGRATION AT WORK

The adaptation story of Quezon City, Philippines

With a population of approximately 3 million people, Quezon City is the most populated city in Metro Manila, the national capital region of the Philippines.[49] The City is vulnerable to multiple climate risks, most prominently floods.

The City's flood mitigation strategy comprises of: (1) drainage improvement programs and development of green floodplains along waterways; (2) development of embankments and participatory resettlement of communities at risk; (3) coordination on engineering works with resettlement strategies; (4) continuous coordination with national government agencies and affected communities.[50]

In early 2018, the City Council launched the Quezon City Local Climate Change Action Plan 2017-2027 (QCLCCAP).[51] The Asian Cities Climate Change Resilience Network (ACCCRN)[52] supported the City Government in formulating the Plan through a series of workshops which enabled the City to identify possible measures against future climate change risks and strengthen understanding of climate change impacts.

The national government is striving to harmonize and complement efforts with local governments to effectively respond to the increasing threat of climate change. This is achieved through various technical assistance activities and multi-stakeholder meetings hosted by the national government in recent years. Formulating, planning, and implementing climate change action plans is formally a requirement according to the Philippine law (*Climate Change Act of 2009*) where it is enshrined that "*Municipal and city governments shall consider climate change adaptation, as one of their regular functions*".[53]

The Climate Disaster Risk Assessment (CDRA) is the main tool developed to support adaptation at the local level.[54] The CDRA is a decision-making tool critical for risk prevention and reduction. It helps local governments formulate climate and disaster risk-sensitive Comprehensive Land Use Plans (CLUPs) and zoning regulations that guide land use planning to reduce (in as much as possible) vulnerability to climate change impacts. The newly developed QCLCCAP is expected to be integrated to the CLUP of Quezon City.

49. Quezon City Local Government: quezoncity.gov.ph

50. Data from the carbonn® Climate Registry (cCR)

51. Philippine School of Business Administration Manila, Philippines (2018), Proceedings of "International Symposium Public-Private Trends in Business Management: Understanding Disaster Risk towards Business Continuity" (January 27-28, 2018): psba.edu/proceedings/international-symposium-january-27-28

52. Asian Cities Climate Change Resilience Network: www.acccrn.net

53. Philippine Law and Jurisprudence Databank, Republic Act No. 9729: www.lawphil.net/statutes/repacts/ra2009/ra_9729_2009.html

54. Housing and Land Use Regulatory Board, Climate Change Commission, United Nations Development Programme and the Australian Government (2015), Supplemental Guidelines on Mainstreaming Climate Change and Disaster Risks in the Comprehensive Land Use Plan: tuewas-asia.org/wp-content/uploads/2017/06/Supplemental-Guidelines-on-Mainstreaming-Climate-Change-and-Disaster.pdf

INTEGRATED APPROACHES FOR A RESILIENT METROPOLIS

Lessons from the City of Accra, Ghana

The Accra Metropolitan Assembly (AMA) of Ghana, the political and administrative authority of the City of Accra, hosts a fast-growing population of almost 2 million people.[55] The AMA is prone to flash/surface flooding. Rapid urbanization, combined with poor water, sanitation, and solid waste management compound this vulnerability, resulting in high annual flood risk.[56]

Flood prone areas within the AMA have been mapped by the Spatial Planning Department to enable identification of high-risk areas. With support from the World Bank, several targeted interventions have been planned for the identified high-risk areas, including construction of drainage systems and upgrading of vulnerable settlements by providing better waste and sanitation facilities to prevent improper disposal of solid waste.

To improve waste collection coverage, the City is incorporating the informal waste collectors into the contracts signed with waste collection companies assigned to various areas of the City. These informal collectors service communities located in poorly planned parts of the City where large trucks are unable to access. Due to the success of this approach, AMA is in the process of registering all informal waste collectors to effectively regulate their operations. In such a way, the City reaps city-wide climate resilience and broader sustainability benefits.

Access to quality/relevant data has been indicated by AMA as a major factor that challenges the City's ability to adapt to climate change.[57] This significant lack constrains the City's ability to assess climate change impacts, estimate their respective costs, and inform appropriate adaptation responses.

Stronger collaboration within the Greater Accra Metropolitan Area and integration of data on transboundary climate change impacts and vulnerabilities could enable the flow of knowledge and streamline international partners' climate resilience support for Accra.

Integrated urban development approaches allow the City to capitalize on multiple sustainability gains while utilizing resources efficiently and engaging a wider spectrum of stakeholders.

Accra City, Ghana image of typically busy street
Image released under CC0

55.Data from the CDP Platform

56.Arup, Cities Alliance (2016), Ghana – Metropolitan Cities, part of Future Cities Africa initiative www.citiesalliance.org/futurecitiesafrica

57.Data from the CDP Platform

04

THE DATA SPEAK: KEY TAKEAWAYS FROM INITIAL STOCKTAKE

Quito, Ecuador neighborhood overlooking the El Panecillo 200-metre volcanic hill

URBAN AGRICULTURE AS AN IMPULSE FOR CHANGE

How can Quito, Ecuador scale up?

Capital and second largest city in Ecuador, the Municipality of the Metropolitan District of Quito is home to over 2.6 million people. Due to its topography, sprawling population, and expansion on fertile agricultural lands, Quito is increasingly dependent on distant food sources (more than 80% of the food imported)[58]. This increases the Municipality's vulnerability to climate-related hazards that impact food and agriculture in the city-region, such as forest fires.

Food and agriculture is one of the five priority sectors identified in Quito's *Climate Change Vulnerability Assessment*.[59] An analysis of current food dynamics in Quito revealed low food resilience.[60] The *Participatory Urban Agriculture Project* (AGRUPAR) was launched in 2002 with the mission to improve food security. Since then, AGRUPAR has increased its scope owing to its resounding success in triggering citizen participation, inclusion of women and vulnerable groups, and economic opportunities.

To date, the initiative has supported agricultural micro-businesses, organic certification, and over 3,000 urban gardens. In addition, technical training on agricultural production, entrepreneurship, and commercialization has been provided to almost 20,000 people, with the total of beneficiaries counting 400,000 citizens.[61] The project has increased household income and generated multiple co-benefits for integrated climate change: urban gardens serve as carbon sinks, low-cost water harvesting and flood mitigation measures.

However, financing urban agriculture remains a challenge (currently AGRUPAR is entirely financed by local sources). Quito is seeking to better integrate the private sector and other relevant stakeholders to scale-up its activities in enhancing resilient food systems and preparing for the needs of its expanding population.[62]

58.Observatory of Economic Complexity, Profile Country - Ecuador: atlas.media.mit.edu/en/profile/country/ecu/

59.Climate and Developed Knowledge Network (CDKN), Secretary of Environment of the Metropolitan District of Quito, Stockholm Environment Institute (SEI), (2014), Climate Change Vulnerability Assessment: quitoestudioclima.blob.core.windows.net/index.html#/ [in Spanish]

60.FAO, Food for the Cities Programme – Quito, Ecuador: www.fao.org/in-action/food-for-cities-programme/pilotcities/quito/en/

61.ICLEI (2017), Resilient Cities 2017 Report

62.Transformative Actions Program (2015), Increasing food security and autonomy through urban agriculture: tap-potential.org/projects/agricultura-urbana-de-quito-como-aporte-a-una-ciudad-sostenible/

City view Bogotá, Colombia
© Jerry Koch licensed under CC BY-ND 2.0

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

05

OVERCOMING BARRIERS AND ACHIEVING A COLLECTIVE VISION ON ADAPTATION

Panoramic view of rice fields
Image released under CC0

5.1 Getting governance right

Local and regional governments have a mandate to ensure their communities are resilient. National plans need to recognize this mandate and ensure national policy equips them to do so. Both incremental and transformative changes are required in order for urban communities to advance on a climate-resilient pathway.

The Paris Agreement invites nations to engage in adaptation planning processes and the implementation of actions to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change, including though the formulation and implementation of NAPs. To achieve that, nations require adequate and reliable data on their hazards, vulnerabilities, and adaptation efforts at all levels. However, the measuring, verifying, and reporting of climate risks within national borders is often not harmonized and as a result nations lack the necessary knowledge of local climate risks, adaptive capacity, challenges and opportunities.

With access to integrated reporting (national, regional, and local government level reports), national governments can better understand local needs and priorities and holistically assess their climate risks. ICLEI is developing an integrated Measurement, Reporting and Verification (MRV) system to connect local level reporting to that of other levels, to support the GCoM committed cities and other local and regional governments tackling climate change.

Integrated MRV is a key component of multilevel climate governance and a valuable tool to enable national and subnational governments to coordinate their efforts and target their resources to achieve more effective climate action. Though an important component, it is only a part of multilevel governance that needs to be combined with policy coordination and partnership building among all levels of government.

Since adaptation is an iterative and country-specific exercise, the NAP process places intentional emphasis on the process. Therefore, to ignite the development and implementation of NAPs worldwide, community engagement, long-term partnership-building, sustained learning and experience in adaptation planning are as essential to nations as reliable local data. Local and regional governments have already laid the groundwork for such processes at the local level and could support nations to kick-off the national efforts with some progress already made.

To finance these efforts, multi-level governance mechanisms are needed to enable access to long-term financing sources for local and regional governments. This is referred to as the vertical integration of NDC and NAP investment plans (see pages 39-40 on adaptation finance).

The *Talanoa Dialogue* is a tool that could drive forward multilevel climate action globally and enhance vertical and horizontal (cities-to-cities) coordination. Ultimately, multilevel governance is built on trust and relationships. Hence the format of the *Talanoa Dialogue* unleashes the potential of various levels of government to jointly work toward common objectives and bridge priorities.

In sum, there is need to strengthen cooperation between and amongst governments at all levels that is underpinned by inclusive, transparent, governance mechanisms.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

> *“ The Talanoa Dialogue is a tool that could drive forward multilevel climate action globally and enhance vertical and horizontal coordination.*

5.2 Zoom in on integrated urban development approaches

As climate change impacts increase, a larger proportion of the population and assets are placed under risk. Therefore, the need for integrated, well-thought out urban planning approaches that focus on minimizing risk and adapting to new environmental and social circumstances arise. Progressively in the future, urban planners and climate leaders will have to coordinate plans and priorities to avoid settlements and new investments in disaster prone areas, apply smart measures to mitigate disaster impacts (e.g. by fostering hybrid blue-green-gray infrastructure), and build in additional contingency measures for critical infrastructure (e.g. by providing reliable evacuation routes during disaster).

According to one report, 75% of the infrastructure that will be in place by 2050 does not exist today,[63] which presents with a huge opportunity and responsibility for city leaders. Infrastructure choices made today will have repercussions in future decades. Therefore, urban planning today needs to be anticipatory in order to give rise to transformative infrastructure that could carry the weight of an increased number of urban citizens.

At the same time, climate change action planning needs to consider synergies with sustainability efforts. For example, investing in climate resilience efforts that fail to deliver wider benefits for sustainable development, such as reducing poverty and/or food insecurity, have limited value for cities.

Examples of effective energy-water-waste schemes in cities underscore such wider benefits for urban sustainability:

- By improving energy efficiency and security (e.g. through micro-grids) cities can better respond to shocks, such as power cuts due to storms, and stresses, such as future increased mean temperatures. For example, as part of its green growth strategic vision, the ***City of Melaka, Malaysia*** is investing in energy efficient buildings and encouraging Energy Performance Contracts for construction of government buildings.[64] Melaka aims at reducing energy consumption of its buildings so as to better address the projected risks of extreme hot days.

- By focusing on efficient water management, cities can improve their resilience to increasing heat waves and the looming prospects of prolonged droughts. Seawater desalination, water recycling, and innovative rainwater harvesting methods could help cities at risk cope with water scarcity and drier conditions. Desalination, though still an expensive process, has improved in sophistication and could cater to the needs of increasing populations in cities of the Global South. In ***Cape Town, South Africa*** desalination is foreseen as part of the City's nine sectoral CAPAs.[65]

- By (re)considering waste management systems in light of their direct dependencies with public health and disaster risk management (e.g. solid waste creates ideal breeding grounds for mosquitos), cities can minimize costs from cascading disaster impacts and transition to more resource-efficient and resilient urban spaces. Local and regional governments can reach better-informed decisions if they anchor waste management systems to a circular development pathway: Implement policies and programs to minimize waste, control its disposal (e.g. diverting waste from landfills), and encourage resource recycling and reusing. Through initiatives that encourage collecting compost and delivering it to local farmers, for example, ***Rio de Janeiro, Brazil*** attempts to convert solid and organic waste into an opportunity for generating value for the City.[66]

63. Wiener, D. (2014), Sustainable Infrastructure as an Asset Class, Global Infrastructure Basel (GIB)

64. ICLEI (2016), Resilient Cities Report 2016

65. City of Cape Town (2017), Climate Change Policy (Policy No. 46824): www.capetown.gov.za/Document-centre

66. For more on the City's integrated development approaches, read Read Rio De Janeiro's Resilience Strategy: www.100resilientcities.org/strategies/rio-de-janeiro

C40's new Adaptation and Mitigation Interaction Assessment (AMIA) tool[67] further highlights the importance of integrated actions at the local level by presenting numerous city case studies where climate change mitigation and adaptation actions are considered through the lens of synergies, trade-offs, mal-investment, and piggy-backing (actions that are complementary when designed and/or implemented together).

5.3 Unlocking adaptation finance at the local and regional level

Given the continued and increasing pressures of climate change, adaptation at the local level is an urgent matter and local and regional governments are currently unable to shoulder the massive infrastructure investments and adaptation efforts required for sustainable and climate resilient development. According to new estimates, the international community has to find ways to close an investment gap of USD 480 billion in order to reach the 1.5°C global temperature target by 2030.[68] Ultimately, the pioneering projects that could help humanity reach this target and bridge the investment gap concentrate in urban areas. Therefore, action needs to be ramped up at all levels of government, including local, regional, and national.

In recent years, significant strides have been made with regards to ***availability*** of funding for adaptation. The Green Climate Fund (GCF), pledged to deliver equal amounts of funding to adaptation and mitigation projects. Of the USD 3.7 billion allocated so far, 32% is for adaptation, 46% for mitigation, and 22% for cross-cutting projects and programs addressing both.[69] These funded projects are expected to increase the resilience of 217 million people.

Though availability has increased, ***accessibility*** of those funds beyond the national level remains limited. Cities continue to be unable to reach the funds due to regulations governing international financial institutions (IFIs) (most of which do not allow direct access to funding for cities); due to the sheer size of the projects (most of IFIs consider project values in millions); or due to inability to develop successful adaptation projects that could contest with nations for the available global pot.

Cities and regions have a series of gargantuan tasks ahead of them: Understanding their risk and vulnerabilities to climate change impacts; identifying priorities and outlining adaptation actions; identifying investment needs; measuring the climate benefits and co-benefits of their interventions in terms of return on investment (RoI); designing sustainable, bankable, and financially attractive adaptation projects. However, the reality is that the preconditions for these steps constitute a challenge on their own as local and regional governments need to first achieve a certain level of financial literacy, acquire expert knowledge, and build capacity in project preparation and design. Though there is demand from IFIs for good quality local and regional projects, investment in building the expertise necessary to create successful local climate projects is a rare commodity.

International financing institutions are called to increase the availability and accessibility of financial resources to subnational governments for climate change action (mitigation and adaptation). In order to widen accessibility, next to the creation of flexible investment mechanisms to fund small-scale projects, ***substantial capacity building and technical***

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

> ***"International financing institutions are called to increase the availability and accessibility of financial resources to subnational governments for climate change action.***

67. C40, Climate Action Planning Resource Centre: resourcecentre.c40.org/resources#interaction-between-adaptation-and-mitigation-actions

68. McCollum D, et. Al (2018) Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals, Nature Energy, http://www.iiasa.ac.at/web/home/about/news/180618-climate-targets.html

69. Green Climate Fund (2018), Seventh Report of the Green Climate Fund to the Conference of the Parties to the United Nations Framework Convention on Climate Change. GCF/B.20/15 (8 June 2018)

assistance for project preparation are required to stimulate sustainable and financially attractive projects at the urban level.

Equipping cities and regions with the skills and tools they need to develop bankable projects is a priority IFIs have recognized in recent years by establishing a number of Project Preparation Facilities (PPFs). However, good project preparation entails pre-preparation steps ("*project incubator phase*") where local leaders are given early-stage support to prepare projects more effectively. ICLEI's Transformative Actions Program (TAP)[70] and C40's Cities Finance Facility (CFF)[71] were created to address this gap.[72] Such initiatives help local and regional governments to develop robust and bankable projects ready for financing and implementation by connecting them with the right partners, experts, and project preparation tools.

Further support is needed to ***quantify the benefits of adaptation actions*** (e.g. in terms of avoided costs and insurance savings) to make a business case to public and private actors. C40's new research (*forthcoming*) aims to provide evidence-base on the co-benefits of adaptation and support cities in demonstrating the success of adaptation action.

In parallel, national governments need to create the necessary enabling regulatory environment which (a) facilitates the flow of resources from the national to the local level where climate action takes place and (b) ensures more autonomy for local and regional governments to systematically leverage investments from Public-Private-Partnerships (PPPs).

Cities and regions would need to combine public and private funding from international, national, local, community, and private sector sources in order to address the anticipated costs of climate change adaptation. Diversification spreads out risk for a more sustainable, locally-controlled strategy.[73] Therefore, it is necessary to consider new partners as eligible piece of the climate change adaptation finance puzzle.

5.4 The partnerships necessary to galvanize climate adaptation from the local level upward

Individual climate change efforts (at the local, regional, or national level) are not sufficient to tackle the increasing global challenges of climate change. The kinds of impactful partnerships necessary to advance on the sustainability agenda and implement the Paris Agreement are composed of hybrid public-private-researcher-citizen engagements, including the following:

- ***Local government networks*** to support directly with capacity building, data access, implementation, measurement, and reporting of progress.
- ***City-to-city partnerships*** to enhance and preserve political commitment beyond political terms.
- ***Public-private partnerships*** to support local and regional governments' adaptation efforts not just in terms of financing but rather in terms of holistic climate risk management at the local level. For example, partnerships between cities and the (re)insurance, real estate industry, and Micro- or Small and Medium Enterprises hold great potential for

70.Transformative Actions Program: tap-potential.org

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

72.C40, Press Release: www.c40.org/press_releases/scores-of-cities-commit-to-bold-climate-action-to-deliver-on-the-highest-ambition-of-paris-agreement

73.ICLEI (2016), Resilient Cities Report 2016

unlocking expertise and resources for sustainable, climate resilient, and socially-inclusive urban development.

- ***Researcher-practitioner partnerships*** to unlock adaptation information and actionable steps forward. Instead of delivering heavy documents, it is rather important to provide easily-digestible and easily-explainable climate science for all (responding to the inclusivity aspect of SDG11).

- ***Community partnerships*** to co-create climate resilience solutions that last. Communities often feel excluded from climate action, which usually translates in their everyday life as increases in taxes and regulations. Genuine engagement of communities could "shorten" the climate resilience pathway toward achieving the Paris Agreement and the SDGs. Urban poor, indigenous communities, elderly, women, and children have long been addressing climate resilience challenges on their own. They are not only holders of key knowledge, but also agents of resilience and social cohesion (see case study below).

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

IN FOCUS:

Know Your City Campaign: Gaining access to relevant climate change data in Global South cities

Often the problem for cities in the Global South is lack of knowledge or data on key aspects, such as urbanization rates, climate change hazards, and how these will affect local communities in the decades to come. Similarly to climate financing, there is no shortage of availability of data, but rather *access* to and *absorption* of such complex information by cities is challenging.

Climate risk assessments and modeling is needed for cities in the Global South. Crucial in this process of collecting, analyzing and synthesizing urban climate data is to actively include the local communities (formal and informal).

Urban dwellers living in slums and informal settlements hold valuable and untapped adaptation knowledge that could support local governments' resilience efforts. Through the *Know Your City Campaign* (KYC),[74] communities in the Slum Dweller International (SDI) network collaborate with city officials and global resilience practitioners to bring slum dweller-generated data into the urban resilience planning process.[75] The KYC global campaign has profiled over 7,700 slums in 224 cities to date.[76] This information is open to the public and scalable to the community level. In such way, informal settlements' data provides a complementary system of knowledge owned by the communities, which apart from being an empowering tool for slum dwellers, is at the same time an asset for forging partnerships on equal footing with cities and resilience partners.[77]

As Rose Molokoane, Coordinator of the South African Federation of the Urban Poor and member on the Management Committee of SDI, put it at the Resilient Cities 2018 congress:

"*To create a partnership with the community is to consult with the community…We are partners, not beneficiaries!*"

> *"To create a partnership with the community is to consult with the community… We are partners, not beneficiaries!*

74.Slum Dwellers International (SDI), Know Your City Campaign: knowyourcity.info
75.ICLEI (2018), Resilient Cities 2018 Report
76.Slum Dwellers International (SDI) network: sdinet.org
77.ICLEI, 2018, Resilient Cities Report 2018

06

CONCLUSIONS AND NEXT STEPS

Narrow alley in South Asian City
Image released under CC0

The findings presented in the above pages come to show that progress on adaptation at the local and regional level is already underway and that there is need to connect the dots at the local (horizontally), but also from the local to the regional and national level (vertically). Cities and regions ought to build upon their own progress and increase their ambition in line with the new scientific information and evidence-base.[78]

Capacity building and enabling regulatory conditions for subnational governments to mobilize, secure, and manage financial resources is needed to meet pressing urban infrastructure investment needs for climate resilient and sustainable urban development. At the same time, substantial mobilization of multiple public and private sources is required to deliver the adaptation financing necessary. Through strengthened partnerships with local government networks and international financial institutions, for example, technical assistance and valuable project preparation advice could reach local and regional governments and allow widened access to adaptation funding and resilience investment.

The private sector is urged to work closely with local and regional governments to generate the necessary capacity (technical and financial), spur innovation, share proprietary data, and develop customized tools to support cities to build climate resilience.

The baseline assessment of local adaptation actions showed that it is imperative to support cities in the Global South in measuring their risk. This is the foundation of any climate resilience effort and if done incorrectly, it could lead to maladaptation and furthering of risk. Such a scenario could be avoided by including local communities (formal and informal), as well as often disconnected research and academia partners in data collection, analysis, and adaptation planning.

To endure and provide value, partnerships need to yield mutual benefits for all involved and be rooted in local communities' needs to be long-lasting and valuable. In the same vein, giving preference to integrated climate actions that offer cross-cutting co-benefits to local communities makes financial, as well as socio-economic sense. Climate change adaptation action, without consideration of wider sustainable development benefits, such as reduction of poverty and food insecurity, leads to short-lived and limited success.

This report demonstrates that with enhanced and aggregated information, local and regional governments can prominently display their leadership in climate action. Stocktaking of local efforts could further advocate this point on behalf of local leaders worldwide – especially as we reach the critical 2020 year when such global assessment of climate progress is due. Therefore, it is essential that local and regional governments continue to assess their risks and vulnerabilities, track their progress, monitor the impact of their actions, adjust action and move up on the ambition scale. The GCoM requires local governments to submit monitoring reports every two years after submitting their action plans. For this reason, it is important that local and regional governments report their actions and action plans in a homogenous way that ultimately enables meaningful comparison and aggregation with other cities. Platforms, such as the cCR and CDP are now using a standardized reporting sheet for climate change mitigation and adaptation, which enables this objective.

The present report provides an initial assessment. Second generation stocktaking is necessary to keep a close eye on needs and challenges

"This report demonstrates that with enhanced and aggregated information, local and regional governments can prominently display their leadership in climate action.

78. E.g. the special report on 1.5 °C above pre-industrial levels of the Intergovernmental Panel on Climate Change (IPCC) launched in October 2018, warned that even if global warming is kept to 1.5 °C, some impacts of climate change are still unavoidable and that certain measures need to be taken, despite the necessary curbing of emissions (www.carbonbrief.org/in-depth-qa-ipccs-special-report-on-climate-change-at-one-point-five-c)

79. GCoM, Requirements: www.globalcovenantofmayors.org/participate/requirements

06

CONCLUSIONS AND NEXT STEPS

> *The next collaborative work of the Joint Work Programme on Resilient Cities could reinforce the findings of this report and allow for enhanced action-taking to support adaptation worldwide.*

of cities – especially in the Global South. The next collaborative work of the Joint Work Programme on Resilient Cities could reinforce the findings of this report and allow for enhanced action-taking to support adaptation worldwide.

One of the objectives of this report is to give voice to local and regional governments in international processes. By attaining a multilevel climate governance system this aim may be fulfilled, as subnational governments representing their ever-increasing constituents (the local communities regularly confronted by climate change impacts) will drive decision-making related to climate action planning, financing, implementing, and scaling up.

Many components need to converge to bring about the system change toward inclusive, safe, resilient, and sustainable ways of living. New ways of collective thinking, new habits, impactful partnerships, innovative technology, and people-centered approaches are in the forefront of the sustainable development pathway humanity needs to follow. Such an endeavor will not be possible for nations without their cities and their surrounding regions and vice versa. "*Data speak louder than words*" reinforces the call for action stemming from overwhelming evidence (science, people, nature) of climate change worldwide. Actions taken by nations, cities, regions, communities, and individuals in the next ten years will be decisive in correcting the course of climate change and overcoming the global challenges of an urban future.

Night market in Bangkok, Thailand
Photo by Sam Beasley on Unsplash

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

ANNEX I

List of City Climate Hazards

The hazards grouping below is based on the City Climate Hazard Taxonomy[80] developed for the *Climate Change Risk Assessment Framework and Tool* (CRAFT), incorporated in the carbonn® Climate Registry and CDP reporting platforms. Each of the main groups incorporates one or more climate change hazards. Presently, all 36 hazards are contained ungrouped in the reporting platforms.

80. C40, Arup (2015), City Climate Hazard Taxonomy. Available at: www.c40.org/researches/city-climate-hazard-taxonomy

Extreme precipitation

Rain storm
Monsoon
Heavy snow
Hail
Fog

Extreme cold temperature

Extreme winter conditions
Cold wave
Extreme cold days

Water scarcity

Drought

Storm & wind

Severe wind
Tornado
Cyclonen (Hurricane / Typhoon)
Extratropical storm
Tropical storm
Lightning / thunderstorm
Storm surge

Extreme hot temperature

Heat wave
Extreme hot days

Flood & Sea level rise

Flash / surface flood
River flood
Coastal flood
Groundwater flood
Permanent inundation

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

Wildfire

Forest fire
Land fire

Mass movement

Landslide
Avalanche
Rockfall
Subsidence

Insect Infestation

Insect infestation

Chemical change

Salt water intrusion
Ocean acidification
Atmospheric CO2 concentrations

Biological hazards

Water-borne disease
Vector-borne disease
Air-borne disease

ANNEX II

City Profiles from UN-Habitat's City Resilience Profiling Programme (CRPP)

MAPUTO, MOZAMBIQUE

Maputo, Mozambique
Climate resilience building in an informal settlement in the capital city
© UN-Habitat

UN HABITAT
FOR A BETTER URBAN FUTURE

Maputo[81] is the capital and largest city of Mozambique and the main financial, corporate and commercial center of the country. It is located on the western shore of Maputo Bay, in the extreme south of the country, near the border with South Africa and the border with Swaziland and, consequently, the triple border of the three countries.

The population of Maputo continues to grow at a rapid rate as the result of high birth rates and immigration. According to the latest data from the National Statistics Institute (INE 2017), there are now over 1,273.076 people living in the city, posing enormous challenges to the local government in its efforts to deliver basic services, provide food, and improve the city's infrastructure. The population of the city has grown enormously. In 1980 it had 770,000 residents, rising to 997,000 in 1997 and to 1.273.076 in 2017.

The Municipality of Maputo is vulnerable to the impacts of climate change, where the incidence of high temperature, flooding, pluvial erosion due to rainwater runoff and coastal erosion due to the process of sea wave dynamics is currently observed. Maputo Municipality has been identified as one of the most risk-prone locations to climate change in Mozambique by the World Bank (2010) and the National Institute of Disaster Management (Mozambique) (INGC).

Through the implementation of the *City Resilience Profiling Tool* (CRPT), UN-Habitat is having the overall goal to identify priority actions that could be taken to help the city better prepare and handle all types of shocks, stresses and challenges, reducing the impact on city inhabitants, infrastructure and functionality. The initiative is hosted within the Urban Planning and Environmental Directorate of the municipality with support from across the local government, including from the Mayor who is pushing forward the implementation as a key approach to addressing resilience in Maputo.

81.Explore Maputo's City Profile under: http://urbanresiliencehub.org/city-profile/maputo/

Initial analysis has indicated that epidemics and pandemics (e.g. malaria), natural risks, such as heat waves, floods and tropical cyclones, and environmental risks such as coastal erosion are the most pressing for the city. Some initial actions have been taken to address these risks but the first step in UN-Habitat's resilience building methodology is to gather and analyze data to identify what the risks are, who is most concerned, who can act and what measures are in place (or not) to address the challenges. In Maputo, 60% of the 140 indicators that comprise the CRPT have been gathered with more data being continuously added to increase accuracy. This knowledge basis – or *City Resilience Profile* – serves as a database to help cities make informed decisions on resilience actions, identify priorities, and simulate the impact of action.

In Maputo, ongoing development projects led by other agencies, such as the Spanish Agency for International Development Cooperation (AECID), are seeking to integrate this knowledge base to build synergies and increase efficiency of their interventions. The Mozambique Environment and Climate Change Group for example highlighted the CRPT as a useful tool for their ongoing work and the central government has shown interest in developing a *National Strategy for Urban Resilience* drawing lessons from the CRPT model.

The Municipality is engaging with UN-Habitat under the *Making Cities Sustainable and Resilient Action* (a joint initiative of UNISDR and UN-Habitat financed by the European Commission) and is exploring how the newly acquired knowledge of city hazards can lead to mobilizing concrete investments in different sectors at city level, including infrastructure.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

EARLY RESULTS

- **Strengthening Local Governance:** Maputo's City Council is working on stablishing a cross-departmental Resilience Unit, with the technical support of the Barcelona City Council and UN-Habitat.
- **Improving Data Collection Mechanisms:** valuable information on performance, risks, and stakeholders have been mapped including detailed and verified data on basic services, built environment, mobility, economy, and environment, among others.
- **Fostering Partnerships:** engagement has been increased and more actors are committed to building a resilient future for Maputo, including civil society (Architects without Borders), national government and ministries, international institutions (European Commission, the United Nations, The World Bank), private sector, and other development actors (the German development agency GIZ).
- **Promoting Capacity Building:** Through CRPT's implementation, UN-Habitat has trained over 90 individuals, including municipal technicians and government partners who are incorporating resilience knowledge into their daily work.
- **Raising awareness towards implementation of Global Agendas:** The initiative has raised awareness about resilience across the city through local and national media coverage. Maputo became a city champion on localizing the Sendai Framework on Disaster Risk Reduction, the New Urban Agenda, the Paris Agreement, and the 2030 Agenda.

FINDINGS

Most pressing shocks and stresses:

Biological risks: epidemics and pandemics (e.g. malaria)

Natural risks: extreme temperatures, floods and storms

Environmental risks: water pollution

ANNEX II

City Profiles from UN-Habitat's City Resilience Profiling Programme (CRPP)

ASUNCIÓN, PARAGUAY

Asunción, Paraguay
Discussing integrated urban development for an expanding city
© UN-Habitat

UN HABITAT
FOR A BETTER URBAN FUTURE

Asunción is the capital and seat of Paraguay's political and administrative power, and the base of its most important services and educational institutions.

Asunción has a total area of 12,751 hectares (127.51 km2), with an estimated population of 524,190 inhabitants as of 2017. This gives it an average population density of 4,111 people per km2. Between 1962 and 2002, its population increased by 100%, and it is currently the only city in Paraguay with more than 500,000 inhabitants, almost 10% of the national population.

The climate in Asunción is warm and mild, with rainfall occurring during all months of the year. The Paraguay River surrounds a large proportion of Asunción forming a natural border on its northern, southern and western sides. Currently, 70% of households in Asunción are connected to the city's sewage system. Only 4% of the region's wastewater receives treatment, with the rest released directly into urban streams and the Paraguay River.

Asunción faces a series of hazards and a variety of structural deficits. The principal hazards are hydro-meteorological, in particular flooding and storms, both directly related to climate change. These are also both hazards associated with extreme temperatures, which have also been identified as a current threat. Biological hazards faced by the city include dengue fever, as well as two other diseases associated with the same vector (the Aedes aegypti mosquito), chikungunya fever and the Zika virus. Finally, water contamination has also been identified as a hazard due to the effects of flooding, the absence of wastewater treatment, and appropriate solid waste disposal systems.

UN-Habitat and the Municipality of Asunción are working together toward building urban resilience through the implementation of the CRPT. This methodology takes stock of ongoing plans and initiatives, maps

stakeholders, and identifies both shocks and stresses the city faces in order to identify concrete actions for resilience.
The CRPT initiative is being led by the Municipality's *Dirección General del Gabinete* (General Directorate of the Bureau) and the *Asesoría del Area Social* (Social Council). A number of focal points (10+) have been assigned from different departments (social care, mobility, and economics, etc.) in order to bring an array of perspectives to the resilience analysis and create an engaged taskforce across the city and a shared vision. Implementation has also attracted interest from international actors working in the city, such as the Inter-American Development Bank, for its potential to build synergies across sectors.

In Asunción, 75% of the 140 indicators that comprise the CRPT have been gathered with more data being added continuously to increase accuracy. Additional threats have been identified, including: biological risks such as epidemics and pandemics (e.g. dengue); natural risks, such as extreme temperatures, floods and storms; and environmental risks such as water pollution. This knowledge basis forms the *City Resilience Profile* of Asunción and serves as a database to make informed decisions on resilience actions, identify priorities, and simulate the impact of action.

In Asunción, UN-Habitat's CRPP work was initiated in 2017 and rapid advances have been possible owing to the growing network of partners engaged in the initiative from across the municipality and other local partners. Each partner provides valuable insights and information on the city that, collectively, creates a reliable and accurate picture of the city and supports informed decision-making. National actors, such as the National Statistics and Census Board of Paraguay have also contributed to this knowledge basis and are keen to explore potential for up-scaling. The new partnerships that are being forged between actors are helping to increase efficiency, build synergies and define collaborative actions to address risks in the city.

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

EARLY RESULTS

- **Strengthening Local Governance:** Asunción is working toward the creation of a metropolitan governance structure in order to face new urban challenges.
- **Improving Data Collection Mechanisms:** The data collection and analysis has increased understanding of key stresses in the city and the best responses, in particular in the areas of water cycle management, mobility and urban poverty.
- **Fostering Partnerships:** Integration of national bodies within local strategies, such as the the National Statistics and Census Board of Paraguay.
- **Promoting Capacity Building:** Training sessions have been organized for some 70 individuals including the Municipality's top managers, technicians, and cooperation partners from civil society who are incorporating resilience into their daily work.
- **Raising awareness towards implementation of Global Agendas:** The initiative has sparked interest from various Latin American cities to build resilience, including Montevideo (Uruguay), Tegucigalpa (Honduras), and La Paz (Bolivia). It has also provided opportunities to increase awareness and visibility about resilience in the local implementation plans of the global agendas for development (Sendai Framework for DRR, the New Urban Agenda, the Paris Agreement, and Agenda 2030).

FINDINGS

Most pressing shocks and stresses:

Biological risks: epidemics and pandemics (e.g. malaria)

Natural risks: heat waves, floods and tropical cyclones

Environmental risks: coastal erosion

ANNEX III

Supporting evidence-base: Messages from C40's Africa Adaptation Forum

ACCRA, GHANA

Accra, Ghana
Coastal area of Jamestown facing multiple challenges, including sea level rise, which is endangering the fishing industry and the people who live nearby the coast.

C40 CITIES

Nine African C40 cities gathered together in Accra, Ghana from December 5 - 7, 2017 for the first C40 Africa Adaptation Forum[82] to discuss climate change adaptation[83]. The Forum started with the Policy Dialogue Day, welcoming the Mayor of Accra, Mr. M. Adjei Sowah, and the Minister of Environment, Science, Technology and Innovation of Ghana, Hon. Prof. Kwabena Frimpong Boateng. The two following days focused on adaptation strategies, risk assessment, best practices, financing adaptation infrastructure, and the meaning of international agreements for African cities. These topics were discussed during interactive sessions with the city officials of nine African cities: Accra, Addis Ababa, Cape Town, Dakar, Durban, Johannesburg, Lagos, Nairobi and Tshwane.

The Forum also saw the announcement of C40's commitment to deliver more support to member cities in the area of climate change adaptation diplomacy. C40's Adaptation Diplomacy is a new program with the aim of enhancing cities as climate leaders on the global stage to accelerate the response to prevent and manage the current and potential effects of climate change. Mayor Sowah and Hon. Prof. Frimpong Boateng of Ghana announced their responsibilities towards meeting the goals on adaptation of the Paris Agreement by contextualizing these agreements to their local context and implementing adaptation action plans. The Mayor of Accra explicitly expressed the importance of collaboration between different layers of government and of the role cities play in the discourse on climate change response.

Policy Dialogue Day (December 5, 2017)

Key messages from the first day:

- The urgency of climate change adaptation in African cities, collaboration with different levels of government and empowering local

82.NOTE: The Asia Adaptation Forum is taking place 6 – 8 November 2018 in Quezon City, Philippines

83.Content adjusted from the C40 Africa Adaptation Forum summary report

authorities to undertake their responsibilities for climate action.

- Implementing SDGs, the New Urban Agenda and Paris Agreement in African cities – the challenges and needs of cities for technical expertise, capacity to generate data and research on the climate impacts, action paths, and financing. (It is often difficult to speak about resilience when "*the bread and butter issues are so pressing*" in the words of Mayor Sowah of Accra).
- The need for collaboration with universities and academia is important to embed science into policy and implement local laws in climate monitoring.
- Communication of climate issues is key to encourage engagement from the public and politicians.
- Suggestions to help cities finance adaptation included: aligning adaptation projects with eligibility criteria of funding grants, stronger collaboration between different stakeholders, and linking adaptation initiatives to larger infrastructure projects.
- International partners who are working to support cities in the implementation of the Global Frameworks, such as 100RC and C40, can complement local groups, such as Slum Dwellers International (SDI) who are involved with community engagement.
- It is important to build champions within city departments that drive adaptation policy development and implementation.
- Data on climate change should drive the conversation to emphasize the importance of climate change adaptation.

Workshop Day 1 (December 6, 2017)

Key messages included:

- The importance of conducting risk and vulnerability assessments to understand how climate change will impact cities. First, cities must define the goal and analyze the existing and potential resources they hold. Then, it is important to map the different stakeholders who have direct or indirect control over the risks and incorporate private sector actors as well.
- The cities of Accra, Lagos, and Addis Ababa presented their adaptation plans and how they used data. For all three cities it was clear that data is of key importance for planning and monitoring adaptation actions. However, statistics on climate change in relation to other data sets, such as poverty or economy, are hard to find. Often there are no specific resources allocated to research to generate data. In discussing solutions, partnerships with universities, research institutions or international organizations were encouraged.
- Education, awareness raising, and community engagement on climate risks as a key for success of adaptation plans in Cape Town and Dakar. It is important to think about target groups, how to communicate with them and when. For example, the City of Cape Town explained how they dealt with the challenge of drought. Through a communication campaign, price increase, and setting legal limits the city has tried to change behavior in water consumption and improve the use of gray water.
- Interdependencies of systems and cascading failures – understanding the full risk map by specialized tools, such as the *Circle Tool*. The tool developed by Deltares aims to start a discussion with different stakeholders on how a climate hazard can affect the critical infrastructure of different sectors of the city and which adaptation strategies could be chosen to mitigate this risk.

ANNEX III

Supporting evidence-base: Messages from Africa Adaptation Forum

ACCRA, GHANA

C40 CITIES

Workshop Day 2 (December 7, 2017)

Key messages included:

- C40's new Adaptation Diplomacy was presented. The aim of this program is to enhance cities as climate leaders on the global stage to influence global, national, and local policies and markets to accelerate responses to the effects of climate change. During this regional forum, the first step towards strengthening the voice of cities in the Global South was made to ensure that the interests of these cities are heard. To achieve that, there is need to address climate change adaptation on a global level and show the actions at the local level in international platforms. As the SDGs are the result of international political negotiation, contextualization is needed: how are the international agreements translated to the local context of the city? C40 aims to strengthen the voice of the Global South, starting with the African cities.
- Information was collected from the cities on the status of reaching the targets of the Paris Agreement. This resulted in a brief overview of the progress on plans, strategies, implementation, and collaboration with national governments for each attending city.
- Data on climate hazards in focus! The *Deadline 2020 project* was presented, outlining the pace, scale, and prioritization action needed by C40 member cities in the next 5 years.
- Financing adaptation infrastructure projects: Most cities noted that government transfers, mostly from the state but also regional, continue to be the primary source of income. The private sector, both commercial banks and corporations, are vastly underutilized sources of funding. There have been both good and bad examples with public-private partnerships (PPPs), some have initially been successful, whereas others have been captured by private interests as soon as profits soared. There were also concerns over the lack of capacity at the municipal level to deal with complex PPPs.

Accra, Ghana Vist at the Dr. Kwame Nkrumah Mausoleum and Memorial Park

DATA SPEAK LOUDER THAN WORDS

Findings from an initial stocktake of climate change adaptation and urban resilience efforts

At the Policy Dialogue Day

FSC
www.fsc.org
MIX
Papier aus ver-antwortungsvollen Quellen
FSC® C005409