



Resilient Cities Report 2018

Tracking local progress on the resilience targets of SDG 11

*BASED ON THE OUTCOMES OF THE 9TH GLOBAL FORUM ON URBAN RESILIENCE AND ADAPTATION
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Resilient Cities Report 2018: Tracking local progress on the resilience targets of SDG 11

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About the Resilient Cities congress series

The Resilient Cities congress series was launched in May 2010 by ICLEI to establish the first global forum on local level climate adaptation and resilience. It is co-hosted by ICLEI - Local Governments for Sustainability and the City of Bonn. The 2018 edition was carried out with the support of the German Federal Ministry for Economic Cooperation and Development (BMZ), the Foundation for International Dialogue of the Savings Bank in Bonn, and Munich RE.

Based on the congress discussions, this publication summarizes key issues affecting cities, local governments and stakeholders around the world. Presentations and session descriptions from the 2018 congress, along with congress proceedings, additional publications, multi-media coverage, and updates on 2019 can be found on the Resilient Cities website: resilient-cities.iclei.org

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Introduction

Resilient Cities is the annual global forum on urban resilience and adaptation convened in Bonn, Germany. The congress series provides an international platform to share the latest knowledge, good practices, challenges, and innovations for creating more resilient cities. It also serves as an annual meeting point to track local progress on the resilience targets of Sustainable Development Goal 11 to make cities inclusive, safe, resilient, and sustainable. The congress outcomes present a snapshot of the state of urban resilience, building on discussions and developments from previous years.

As an official Cities and Regions Talanoa Dialogue event, the 9th edition of Resilient Cities attempted to answer the three main questions of where we are, where we want to go, and how we get there in achieving a resilient and sustainable urban future. Participants discussed the incremental and transformative changes required to advance on the resilient development pathway. In focus were: (1) how to strengthen multilevel governance in order to achieve the Paris Agreement and Agenda 2030; (2) how to yield resilience and sustainability benefits from nature-based solutions; (3) how to reinforce multi-stakeholder collaboration and bring key resilience partners together, including the private sector, the insurance industry, climate scientists, and community leaders. The sessions addressed emerging links between urban resilience and resource efficiency/circular economy pathways and explored the growing challenges of Big Data and digitalization for cities and regions. Participants also shared best practices for ensuring resilient food systems, enhancing social cohesion, and citizen participation in resilience building efforts.

This report reflects the outcomes of the Resilient Cities 2018 congress and global developments in the field of urban resilience and climate change adaptation. The following pages highlight specific tools, initiatives, case studies, and solutions presented from local governments and practitioners around the world. The findings are cross-referenced to additional resources.

Table of Contents

Resilient Cities rationale	4
Developments in urban resilience from 2017 - 2018: Looking at the city of tomorrow	5
Key developments in urban resilience	6
Talanoa Dialogue at Resilient Cities	7
Building urban resilience in Small Islands and Developing States	8
Nature-based solutions: Improving evidence-based information to unlock finance	10
Protecting natural and cultural heritage for enhanced urban resilience	11
Transition toward resilient food systems and circular development	12
Strengthening resilience through socially cohesive communities	14
Reality Check Workshop: Istanbul, Turkey	15
Evidence-driven, data-based urban resilience planning and action	16
From theory to action: A global framework to foster cities-insurers collaboration	17
Emerging challenges in urban resilience: The resilience of digital cities	19
Outlook for 2019	21
Resilient Cities 2018 congress at a glance	22
References and further reading	23

Resilient Cities rationale

According to the latest *sigma* study estimates, 301 disaster events occurred in 2017, of which 183 were “*natural disasters*”^{*} owing mainly to severe storms and precipitation and earthquakes. Overall, more than **11,000 lives** were lost due to disasters and though this number represents similar casualties with 2016, it is still a devastating statistic. The overall economic losses in 2017 have almost doubled from USD 180 billion in 2016 to **USD 337 billion** in 2017 (Swiss RE, 2018).

Floods and mudslides occurring close to Freetown, Sierra Leone (August), mark the deadliest event of the year as 1,141 persons lost their lives or went missing and thousands were rendered homeless. Floods caused by heavy monsoon rains in India, Bangladesh, and Nepal led cumulatively to over 1,000 deaths (July-August). In Colombia, torrential rains (March) led to a massive mudslide in the municipality of Mocoa, which caused 250 casualties and severe infrastructure damage (NASA, 2017).

As in previous years, urban areas bore the brunt of disasters due to the concentration of population and buildings and interconnectedness of urban infrastructure. Two strong earthquakes shook Mexico in the span of two weeks (September): A record Mw 8.1 quake which affected predominantly rural areas and led to 96 casualties; and a Mw 7.1 quake which affected major urban centers, including Mexico City and almost tripled the amount of casualties (369 dead). Striking on the tragic anniversary of the catastrophic 1985 earthquake, which claimed the lives of 12,843 persons in Mexico City alone, the disaster inflicted structural damages to private and public buildings (Munich RE, 2018). However, building codes and early warning systems introduced in the aftermath of 1985 proved their value, as the majority of collapsed buildings in 2017 were constructed before the codes and thousands were able to evacuate their homes and seek protection during the seismic alert sounds.

In the second half of 2017, the North Atlantic successively experienced Hurricanes Harvey, Irma, and Maria which wreaked havoc across the Caribbean Islands, Puerto Rico, and Texas, USA causing over 350 casualties and economic damages of USD 217 billion – a staggering 64 percent of the global economic losses from merely a hurricane season (Swiss RE, 2018). The reasons for such unprecedented losses are still under examination by all levels of governance and insurers alike. Individually, these hurricanes were exceptional in their intensity (category 4-5), duration, and rapid progression, while as a cluster of successive severe storm events they challenged disaster preparedness and response in even the most comparatively prosperous areas, such as the metropolitan area of Houston, USA. The Caribbean Catastrophe Risk Insurance Facility quickly disbursed funds to cover part of the losses and support Small Island Developing States (SIDS) in their recovery process (CCRIF, 2018). The CCRIF's fast mobilization brings forth the important and increasing role the insurance industry plays in global sustainability and resilience efforts (for more on this, see page 17).

Such efforts need to be sustained by increased technical and financial support for long-term, comprehensive disaster risk management approaches, since climate change is likely to increase the occurrence of such “exceptional” hurricane seasons and tropical monsoons in the future. Continuing population growth, in combination with (uncontrolled) urbanization and increasing climate change impacts demands the world to work together to come up with practices, innovations and transformative actions to achieve a long-term resilient development pathway for future generations.

“[Urban resilience means] ... to anticipate, prevent, absorb and recover from shocks and stresses, in particular those brought about by rapid environmental, technological, social and demographic change, and to improve essential basic response structures and functions.” (ICLEI Montréal Commitment and Strategic Vision 2018 – 2024, ICLEI, 2018b)

The Resilient Cities 2018 congress served again as a platform for the exchange of ideas and good practices among urban resilience experts and practitioners, and took stock of where resilience and adaptation stands and how to get to where we need to go to achieve a well-below 2 degrees world.

* This is a term used by the insurance industry to signify disasters owing to nature forces, as opposed to “technical” or “man-made disasters”, e.g. conflict, terrorism, mining accidents. Though, the international resilience community widely accepts that since the causes of climate change are man-made, the disasters are also not “natural”, but rather unnatural consequences of man-made decisions.



The aftermath of Hurricane Harvey in the city of Houston, USA. © By CNN



Mudslides in Sierra Leone mark the deadliest event of the year. © By VOA News



The consequences of the landslide in Mocoa, Colombia. © By 90 Minutos

■ ■ ■ Developments in urban resilience from 2017 - 2018: Looking at the city of tomorrow

In 2017, local and subnational governments collectively reaffirmed their commitment to the objectives of the Paris Agreement and to continuing working toward a more safe, inclusive, resilient, and sustainable future for an increasingly urbanizing world.

At the *Climate Summit of Local & Regional Leaders* during the 2017 United Nations Climate Change Conference (COP23), cities and regions sent a strong signal for climate action by stating their pledges, ambitions, and actions through the [Bonn-Fiji Commitment](#) (Cities and Regions, 2017a) which celebrates an era of inclusive and transformative global climate architecture – one that takes concerted efforts across all levels of governance to achieve a way below 2 degrees world. The *Talanoa Dialogue* was also born at COP23, as the process to strengthen national climate plans known as Nationally Determined Contributions (NDCs) through multi-stakeholder collaboration (read more on page 7).

A recap of most relevant urban resilience and adaptation outcomes from COP23 – available resources:

- Suliman, A. (2017), *Climate resilience for the poor inches forward at UN talks*. Access here: www.zilient.org
- ICLEI (2017b), *Boosting subnational climate action through new climate governance*. Access here: carbons.org
- Cities and Regions (2017b), *28 November – COP23 Wrap-up Digest*, access here: cities-and-regions.org

In February 2018, the *Cities and Regions Talanoa Dialogue* was launched at the 9th World Urban Forum aiming to build upon the Talanoa spirit of inclusivity by inviting local and subnational governments in the stocktaking and climate action decision-making process. In March 2018, the IPCC Cities and Climate Conference (CitiesIPCC) in Edmonton, Canada assessed the state of the academic and practice-based knowledge related to cities and climate change and established a global joint research agenda (see more on page 16). At the CitiesIPCC, the first batch of Cities and Regions Talanoa Dialogues was announced, with the Resilient Cities 2018 congress in Bonn, Germany (April) and the ICLEI World Congress 2018 in Montréal, Canada (June) among the first events included.

In 2018, local and regional governments ramped-up their engagement in assessing the progress on the Sustainable Development Goal 11 (SDG11): *“Make cities inclusive, safe, resilient and sustainable”* – one of the six Goals under review at the High-Level Political Forum in July. ICLEI perceives SDG11 as the central lever to attain all other goals (ICLEI, 2018a) and draws attention to the potential and responsibility of local and regional governments to achieve the SDGs for the wellbeing of their residents and the urban community as a whole.

The urban future needs to be resilient, sustainable, inclusive, safe, resource-efficient, innovative, with a circular-economy and smart infrastructure. Many more requirements could be added to the vision, which increase the already complex organism that is an urban environment. The *city of tomorrow* is wreathed with complexity, but through integrated and inclusive action a level of simplicity could be achieved. For this purpose, local and subnational leaders need to work alongside national and international actors, share data, integrate climate action and reporting across all levels, and pilot cooperative projects and new financing models that advance implementation and deliver on global climate and sustainability goals.

Collaboration is the answer – but we’ve heard this multiple times. *How* do we forge impactful partnerships that enable the localization of the SDGs and the implementation of the Global Frameworks on the ground? Perhaps we should start by building trust and mutually beneficial, strategic partnerships rooted in communities’ needs and leading to a common vision for the future. Another necessary step is to bring new partners in resilience efforts, such as the (re)insurance and real estate industry and Micro- or Small and Medium Enterprises (MSMEs and SMEs), or bring previously disconnected practitioners to fill in the puzzle of climate knowledge in cities. For example, climate scientists, researchers, and academics need to join forces with informal knowledge sources, such as slum dwellers, to support city-wide resilience planning and implementation.



Patricia Espinosa, Executive Secretary, UN Climate Change; Co-Patron of Resilient Cities 2018



Ashok Sridharan, Mayor of Bonn; Co-Patron of Resilient Cities 2018



Mami Mizutori, Special Representative of the SG for Disaster Risk Reduction; Co-Patron of Resilient Cities 2018



Norbert Barthle, Parliamentary State Secretary to the BMZ; Co-Patron of Resilient Cities 2018

As an important global meeting that connects the dots between milestone events in 2018, the Resilient Cities congress set off to explore these ideas and provide answers and local solutions based on best practices and innovations shared by urban resilience practitioners. The main focus of the congress was to take a future-oriented perspective and imagine the *city of tomorrow* and what this could mean for the people inhabiting it, the urban systems that make it function, and the intertwined challenges that inevitably lie ahead in terms of climate change, environmental and economic shocks and stresses, urbanization, and limited resources.

"We live in times of change. Not all of this change is welcome. Some is threatening. Like conflicts; like radicalization; like climate change. However, we also live in times of change-makers. And cities (and regions) have proven themselves to be such change-makers in the best possible way." Ashok Sridharan, Mayor of the Federal City of Bonn, Germany; ICLEI President and Special Messenger to UNFCCC and carbonn Climate Registry

At the same time, the Resilient Cities congress continued to **track local progress on the implementation of the SDGs and particularly on the resilience targets of SDG11**. This cross-cutting purpose of the congress framed the discussion, with several local and subnational leaders sharing their local experience, policies linking to SDG11, as well as obstacles and ways to overcome those.

Data compiled in the carbonn Climate Registry (cCR) provides a snapshot of the state of climate adaptation at the local and subnational level and indicates that there is local data and knowledge readily available to inform national frameworks and national adaptation planning and implementation. This data analysis, also shows that though some progress has been made on urban resilience, efforts need to be rapidly scaled up globally. In this important stocktaking year, it is relevant to critically appraise what is blocking advancement at the local and subnational level, which assets, partnerships or opportunities are thus far missed. Such review is meant to raise the ambition of all levels of governance to effect positive change for a sustainable, resilient, livable urban future for all!



Patrick van Weerelt with an SDG Rubik's cube at Mayors' Lunch, 26 April

"This Agenda is about more than 17 SDGs. All 17 SDGs are important pieces of the puzzle, but if you have all pieces, the puzzle is not complete...It is like a Rubik's Cube, which represents that we cannot solve any problem by focusing on one side alone, as any action on one side immediately influences other sides as well..." Patrick van Weerelt, Head of Office, UN Knowledge Center for Sustainable Development



Mayors' Lunch during Resilient Cities 2018 congress

■ ■ ■ Key developments in urban resilience

The following section summarizes key developments of urban resilience globally by subtheme based on the outcomes of the Resilient Cities 2018 congress (see page 22). Highlights included: Exploring transformative climate action through nature-based solutions; multilevel global climate governance; resilience and socially cohesive societies; evidence-based action and ways to bring new knowledge to practitioners and communities. Critical reflection on new technological advances, such as increased digitalization, Big Data, and smart technology, and how these support or challenge urban resilience was encouraged. Findings are cross-referenced to additional information and online resources.

Talanoa Dialogue at Resilient Cities

There is global consensus on the necessity to have a [holistic approach](#) in urban resilience and adaptation planning. However, bridging different stakeholders' priorities, ideas and competences and blend them together in a cohesive solution continue to represent a major challenge.

The [Talanoa Dialogue](#), an outcome of the COP23 in Bonn, tries to tackle this issue by offering the opportunity for an inclusive, transparent, and participatory dialogue with the aim to take stock of collective efforts and raise the ambition of the NDCs (Talanoa Dialogue Platform, 2018). Differently from other formats, the Talanoa is a process that disrupts the traditional top-to-bottom, highly technical conversation. In fact, participants – regardless of their hierarchy – build trust through knowledge-sharing, understanding and empathy, responding to three main questions understandable to all: Where are we? Where do we want to go? How do we get there? Such holistic approach has the potential to bring about coherent implementation of national commitments and coordinated investments in climate action.

“The Talanoa Dialogue is crucial for us to discuss what works and what does not work and to see what can be improved to achieve ambitious climate goals faster [...] The Talanoa Dialogue is a chance for cities and regions to have their voices heard.” Patricia Espinosa, Executive Secretary, UN Climate Change, Bonn, Germany

Through the Cities and Regions Talanoa Dialogues, launched in support of the global process (see page 5) at the World Urban Forum in February 2018, cities, regions and their networks are inviting national governments to the table to drive forward multilevel climate action worldwide (Cities and Regions Talanoa Dialogues, 2018). Resilient Cities 2018 served as an official **Cities and Regions Talanoa Dialogue**, ahead of the official UN “Bonn talks” (or “May Sessions”), which provided the first opportunity for Parties and non-Party stakeholders to engage in this facilitative process.

“The Talanoa Dialogue will address this crucial intersection where sustainable urban development is considered hand-in-hand with efforts to enhance climate ambition with a sense of urgency.” Inia Seruiratu, Fiji's Minister, COP23 Presidency, High Level Climate Champion

Through specially-tailored sessions and the high-level **Talanoa Dinner**, congress participants attempted to answer the three main questions, while discussing key challenges and opportunities in the way of building a resilient and sustainable urban world. For example, the Special Capital City District of Jakarta, Indonesia shared that their main obstacle in reaching bold climate targets and building climate resilience is lack of collaboration among the fragmented governance bodies that make up the Greater Jakarta Area and urged for collaborative, multilevel, multi-stakeholder climate governance to support the capital's climate vision and actions.

“Talanoa [Dialogue] is a serious discussion on how to increase our ambition [...] As a German, it is not so easy to discuss. We are lagging behind our national target [...] We have to be serious and transparent and assess why we weren't able to achieve our target. The best thing to do with failure is do an assessment – what have we done wrong?” Jochen Flasbarth, State Secretary, German Environment Ministry

At the special **Talanoa Dialogue and Dinner** on 27 April, delegates reaffirmed the importance of engaging all levels of government in addressing climate change in the context of pursuing the SDGs and the New Urban Agenda (NUA). The dinner featured an innovative round-table discussion where delegates were encouraged to share one positive and one challenging story about finance, legal frameworks, and technical solutions in implementing the Paris Agreement. Building capacity and fostering integrated policy approaches to address the adverse impacts of climate change were highlighted as the main needs of local and regional governments. Delegates also agreed that the Cities and Regions Talanoa Dialogues are likely to strengthen the dissemination of relevant tools, training, and expert assistance and de facto provide the necessary technical support for assessing mitigation and adaptation needs with a view of following a low emission, resilient pathway.



The Talanoa Dinner, hosted at Bonn's historic City Hall, represented a special highlight of the Congress. Mayors and local government representatives had a chance to engage and share their knowledge according to the Talanoa format

“Cities and regions hold the key to achieving the Paris Agreement goals... Their leadership will lay a solid foundation for Parties’ work in the lead up to COP24.” Tomasz Chruszczow, Poland’s Chief Climate Change Negotiator, COP24 Incoming-Presidency Special Envoy

Actionable requests toward all levels of government at the **Talanoa Dialogue and Dinner**:

1. Abandon “*silo thinking*” and work together to align actions and vision with all relevant entities, including our own citizens;
2. Get the governance right! Dare to be courageous and change regulatory and governance frameworks to drive ambitious action;
3. Direct finance to the local entities (a constant request) so they may implement the national vision from the ground up;
4. Bring a sense of urgency into the negotiation room (at the UN), as the effects of our failure to reach the 1.5 degree goal will be first felt at the local level (see the example of Louisiana below).

Talanoa case study: Louisiana coastal area

The coastal area of the [state of Louisiana, USA](#) is increasingly giving way to water due to a combination of factors, such as land subsidence in the Mississippi river delta, rising sea levels, and hurricanes. This undoubted fact of annual land loss and sinking has led to economic, social, and cultural concerns about the future of a vibrant area.

The Louisiana Office of Community Development – Disaster Recovery Unit (OCD-DRU) is currently leading the efforts to mitigate the impacts of climate change and plan for a managed “*retreat with dignity*” and community consensus. With a grant of USD 92.6 million awarded by the U.S. Department of Housing and Urban Development, the OCD-DRU is implementing two projects: Louisiana’s Strategic Adaptations for Future Environments (LA SAFE) and the resettlement plan for the Isle de Jean Charles, the first publicly-funded, climate change-induced resettlement project in US American history.

Both projects are centered on citizen participation. Open meetings, constant engagement, and consultation with local communities have been crucial to the adaptation efforts. Such approach ensures that plans for integrated water management or relocation and re-definition of a community’s new home are viable and sustainable practices.



The aftermath of a hurricane in Isle de Jean Charles, Louisiana © By Pixabay

Building urban resilience in Small Islands and Developing States

In the towns, villages, and municipalities of Small Islands and Developing States (SIDS) local leaders are dealing with similar urban issues as their counterparts in larger metropolises around the world, including water and waste management, slum housing, and traffic. On top of these, they have to also cope with climate vulnerabilities to prolonged and intense meteorological events (e.g. cyclones) and sea level rise. As a result, their already limited resources and capacity to respond to the needs of their people for economic development are overstretched.

Climate change is indeed already posing an existential threat for the communities of SIDS. It is not a theoretical question; it is the everyday reality for people living there. Pacific islands, for instance, have been experiencing anomalies in weather patterns for the last decades. Recently, they have been ravaged by cyclones, droughts, flooding, and other increasingly intense climate-related hazards – a bitter pill to swallow for countries that barely contribute to global emissions. In 2016 alone, Fiji suffered 44 casualties and USD 1.4 billion in damages as a result of Cyclone Winston, one of the most powerful tropical storms ever registered in the area (COP23, 2017).

To further exacerbate the situation, SIDS’ fragile economies strive to back large-scale adaptation plans. On the one hand, collective sources of revenue and rooted traditions – like coral trade – are themselves worsening local environmental conditions and are therefore progressively being banned (a decision bearing significant political costs). On the other, SIDS’ tourism dependency puts a strain on all levels of government to protect the coastline and preserve mangrove forests, without driving the tourism industry away. A way forward could be the promotion of ecotourism and collective SIDS decision on a set of rules that apply for all. If all islands passed conservation regulations simultaneously, there would be no other choice for the tourism industry but to follow the rules.

Recognizing the risk of being submerged within only a few decades if sea levels rise continues at the current pace, relocation is on SIDS minds. Already Fiji presented a case of *the first village to relocate* to safer grounds due to the impacts of climate change, with about 40 communities recommended for a similar approach (COP23, 2017). In Solomon Islands, an entire island is planned for relocation starting in 2030 – though the plan is subject to availability of funding (see Taro Island, Choiseul Province case study in Resilient Cities 2015 Report, ICLEI, 2015). Larger SIDS neighbors, such as New Zealand acknowledged the likelihood of becoming migration hubs for future “climate refugees” and have started to provide migration schemes for Pacific islanders (Campbell, Warrick, 2014). Though resettlement might continue to be explored as a possibility, it is still regarded as a last resort for island communities. Adaptation remains the key priority.

“Climate migration is really the human face of climate change.” Viviane Clement, Climate Change Specialist, The World Bank, Washington D.C., USA

Resilience - and help - is needed, but some progress is already made

Yet, SIDS tend to have a frequently overlooked asset: Cohesive and supportive communities. People bound together by traditions and feelings of belonging can spur bold climate action by cooperating in concert with all levels of government. In Fiji, this distinctive feature has already led to some successes on land use schemes, waste management and river planning. Awareness campaigns on local and national media are bringing forward such achievements.

In the long run, SIDS will need to scale-up their adaptation projects and replicate them elsewhere. **Ecosystem-based adaptation (EBA)** could soundly catalyze resilience and prove to be an appropriate climate change adaptation approach for the Pacific communities. In [Port Vila, Vanuatu](#), where deforestation and pollution have in recent years increased environmental problems, a ridge-to-reef project funded by the International Climate Initiative (IKI) of the German Government focused on mangrove restoration to regenerate the coastal ecosystem, urban and peri-urban agriculture to promote food security, urban forestry, and sustainable coastal housing and livelihood practices. As part of the project, key local and national government, donor and community stakeholders were interviewed with the aim to map and assess Port Vila’s ecosystems and their services, while training and awareness workshops were provided to build capacity for EBA measures. Similar projects have been applied in other islands. However, institutional and financial constraints for scaling up EBA approaches in the region remain.



Steve Gawler, Regional Director, ICLEI Oceania



Port Louis, Mauritius, one of the SIDS at the frontline of climate change © By garybembridge

Financing for adaptation projects of the scale necessary is lacking, making international help inevitable. For example, Fiji would need USD 4.5 billion to fund climate change adaptation measures – an amount close to the country’s annual GDP. The Fijian government to some extent has overcome such restraint by issuing sovereign green bonds to support adaptation projects (World Bank, 2017). The small island nation also raised international awareness of the immediate threats and needs of SIDS during its COP23 Presidency, where the Talonoa Dialogue was born (see page 7). At COP23, ICLEI and the Global Island Partnership (GLISPA) established the [Frontline Cities and Islands](#), a movement of mayors and leaders of island economies who commit to advance local action to deliver scalable, integrated solutions to build resilience. Currently, through the Frontline initiative, ICLEI and GLISPA jointly support local governments’ capacity building for resilience, by offering risk assessment tools and facilitating multi-stakeholder Disaster Risk Reduction (DRR) workshops based on the [Sendai Framework for Disaster Risk Reduction](#). The Frontline initiative also supports local governments to develop joint work programs and share solutions and develop innovative financing mechanisms.

SIDS need to capitalize on the international attention and the Frontline momentum and weave a tight net of collaboration and mutual support to advance their climate action and build resilience to increasing hazards. By partnering with the private sector (including the highly overlooked insurance sector), international local government networks like ICLEI, intergovernmental organizations such as the Pacific Regional Environment Programme and UNISDR, and relevant local and indigenous groups, SIDS may manage to address climate change impacts and thrive in the face of adversity.

“Trapeze artist in the circus has a safety net, the net is made up of many different connections working together, when the artist falls in the net the net absorbs and bounces back.” Herman Timmermans, Project Manager, Pacific Regional Environment Programme, Suva, Fiji

Nature-based solutions: Improving evidence-based information to unlock finance

According to the International Union for Conservation of Nature (IUCN), nature-based solutions (NbS) are: “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (IUCN, 2018).

Cities and regions around the world are taking action to integrate NbS into planning, infrastructure, and climate change strategies as they are considered to be a resource-efficient approach to sustainable and resilient urban development. NbS have the potential to regulate the micro-climate; re-connect people with nature; promote human well-being and health; support food security, livelihoods and economic development; enhance resilience and safeguard ecosystems and biodiversity (ICLEI, 2017c). They may also spark innovation by increasing [friendly competitiveness](#) within cities and between cities and encourage design fusion by integrating the housing/building sector with nature conservation/protection approaches.

It is often necessary to find common pathways to accommodate disparate stakeholders’ interests, such as the tourism sector with local governments’ mangrove protection efforts (see Fijian example page 8). To achieve that and ideally turn investments into catalysts for realizing NbS, it is crucial to map these interests and raise awareness of citizens and businesses so that gradually the “business as usual” is ecotourism and NbS are the obvious options for new development, instead of conventional engineering options. Such behavioral change is urgently needed in Zamboanga, Philippines, a city located in a province with one of the highest deforestation rates in the country and home to critically endangered species, such as the Philippine Eagle (Cabico, 2018). Deforestation there is driven mainly by turning forests into agricultural land, illegal occupations in upland forested areas and private sector sponsored settlement projects. Regulations need to be enforced in order to preserve forests from rapid urbanization and land use changes. Regular assessment and monitoring of progress also needs to be in place in order to take appropriate measures, adjust strategies, and avoid maladaptation.

Maintenance of such efforts strongly depends on applying new finance mechanisms and having access to climate finance for the long-term sustainability of local NbS projects.

Horizontal integration is required to institutionalize NbS and integrate such approaches into all aspects of decision-making across different government sectors, including planning, environmental protection, housing, health and well-being, and infrastructure. Additional challenges may arise when standards and minimum requirements are needed, as well as *evidence* of nature-based solutions’ co-benefits. In this sense, data collection and sharing is crucial to foster collaboration and co-production of knowledge linking research, business and civil society with policy makers.

CitiesWithNature, an initiative by ICLEI, IUCN, and The Nature Conservancy (TNC) launched at the ICLEI World Congress 2018, is a global platform for cities and regions, their communities and experts to connect, learn and inspire each other in mainstreaming nature into urban areas in ways that benefit both people and nature (CitiesWithNature, 2018). These stakeholders are invited to share policies, plans, commitments, actions, and results related to nature and ecosystems services to build a business case around NbS in urban and city-region landscapes.

Such initiative could help cities to demonstrate that NbS are scalable and attractive to financial institutions and international donors who are looking for large-scale demonstration projects that are flexible enough to be transferred and customized to different contexts. The main business argument would be: **NbS are multi-functional, flexible and offer an abundance of co-benefits, while stimulating the local economy by increasing opportunities for revenues from sustainable practices.** NbS co-benefits could also interest the insurance industry, as investments in such projects could help mitigate risks to public health (including mental health) and damages to insured property. Climate change adaptation measures may benefit from cost-effective alternatives offered by NbS. These may contribute to and benefit from other emerging topics, like circular economy and urban metabolism, and eco-innovation when integrated into forward-thinking policy making.

Though long-term financing for local and subnational governments is theoretically available (through the direct access modality of the Adaptation Fund, for example), access to the available pot remains a challenge. The CitiesPCC Cities and Climate Change Science Conference highlighted that access could be



Zhang Xinsheng, President of the International Union for Conservation of Nature, during the Opening Reception hosted by the City of Bonn

widened by improving evidence-based information on the potential societal and environmental benefits of nature based solutions (CitiesIPCC, 2018).

In the meantime, greening fiscal policies could open doors for innovative financing mechanisms for NbS. Stuttgart, Germany for example, has introduced tax incentives and tailored financial programs to complete its green roof expansion strategy (ICLEI, TNC, 2017). Pooling efforts with multiple local governments might also prove helpful, as increasingly large scale donors like the European Union encourage cities to work together to receive substantial financial support for integrated sustainability projects. Lastly, providing incentives for cities and citizens could support the business case for NbS and bring about the necessary mentality switch away from relying on finite resources toward utilizing the existing natural and replenishable arsenal at cities' disposal to achieve sustainable urban development.



Resilient Cities 2018's special sub-plenary "Driving transformative climate change adaptation in cities through nature-based solutions"

Protecting natural and cultural heritage for enhanced urban resilience

"The symbolism inherent in heritage is... a powerful means to help victims recover from the psychological impact of disasters. In such situations, people search desperately for identity and self-esteem... Heritage contributes to social cohesion, sustainable development and psychological wellbeing. Protecting heritage promotes resilience." UNESCO, et al. (2013)

Natural and cultural heritage is our legacy from the past, what we live in today and what we will pass to future generations. Natural heritage, such as ecosystems and biodiversity, often benefit us economically, socially and environmentally. Cultural heritage, instead, keeps us connected to our religion, traditions and beliefs, forging and developing our identity as individuals and communities.

It is now widely recognized that heritage can act as a powerful force, driving nature-based, climate-resilient and sustainable solutions for tomorrow's urban environments preserving yesterday's wisdom.

This idea is currently gaining a new momentum. In 2016, Italy's central regions suffered a series of devastating earthquakes, which caused estimated costs for €23.53 billion, of which €541 million was damage to heritage sites (UNRIC, 2017). The destruction of historical town centers, churches, and art sparked international attention on the urgency to include heritage protection into urban resilience planning.

At Resilient Cities 2018, local governments explained how they actively engaged with citizens to boost their feeling of identity towards the city and ownership of its cultural and historical wealth, while at the same time creating economic opportunities and taking measures to enhance urban resilience without altering characteristic areas. For instance, [Guimarães, Portugal](#) presented its best practices that led the municipality to become the *European Union Capital of Culture* in 2012, *EU City of Sport* in 2013 and the *most sustainable city in Portugal* in 2017. Guimarães credits its success to its engaged "eco-citizens", citizens who are proud of their municipality, culture and heritage. Similarly, [Bologna, Italy](#) displayed its installation of temporary green areas, such as overhead



Norcia, Italy: aftermath of a 6.5 magnitude earthquake, which destroyed invaluable historical heritage. © By Pixabay

gardens, in an effort to bring nature back to the city without altering historic pathways or transforming the city's unique look. Last, [Zamboanga City, Philippines](#) improved its capacity to respond to typhoons simply by identifying and protecting its key biodiversity areas.

The cities above elaborated their strategies by engaging the population, which in turn forged a sense of ownership for the projects. As a result, the populations themselves began to actively push for more permanent solutions in urban resilience and heritage preservation, as well as for expanded partnerships with universities and the private sector.

Nevertheless, preserving heritage remains a challenge for most municipalities worldwide, hindered by three main obstacles (G7 Academies, 2017):

1. Willingness by governments and citizens to recognize and protect their heritage, a definition that can vary greatly across countries and cultures. Cultural heritage, as opposed to natural heritage, cannot be rebuilt once destroyed or lost, hence the urgency for action.
2. Risk assessment of often non-marketable assets (such as historic buildings or traditional mangrove protection measures), as well as their replacement price. Although a task mainly entrusted to the insurance industry, insuring heritage assets requires holistic and extensive discourse – such as the Talanoa Dialogue – connecting multiple stakeholders' needs.
3. Highly technical and often expensive protective measures necessary due the often fragile nature of historical buildings and heritage collections.

Key takeaway: Only when national and local governments enhance their collaboration and establish partnerships with universities and the private sector (including the insurance industry) will they be able to address those obstacles and promote effective strategies to protect and preserve heritage for enhanced urban resilience.

“Cultural heritage tells the story of peoples in all their diversity. It embodies the points of reference and values that define our shared humanity and ensure the cohesion of our societies. Some have given their lives to defend it.”

Irina Bokova, Former UNESCO Director-General, addressing the United Nations Security Council on 24 March, 2017

Transition toward resilient food systems and circular development

The need for inclusive urban food governance

Global urbanization trends combined with hunger and malnutrition rates, poverty, vulnerability to climate change impacts, as well as hard limits of natural resources to feed a growing world, have given rise to a vigorous debate on how to achieve a resilient and sustainable food supply in the near future. The achievement of the SDGs depends on substantial transformations of food systems – including their governance structures which drive policy planning at the local and national levels (FAO, 2017).



ICLEI-RUAF CITYFOOD Network meeting at the congress

UN Environment, Hivos and Biovision developed a [Sustainable Food Systems Transformative Framework](#) (SFS Framework) which combines key policy-levers, methodologies, tools and collaborative activities across the food system, exploring how a transition to sustainable food systems could be stimulated by local and national governments. The initiative engages government, private sector, and civil society through a mandated mechanism with the aim of building consensus on the urgency of a holistic approach and integrated policy-making to achieve sustainable food systems.

The SFS Framework could improve institutional arrangements and empower public institutions to manage food systems while creating better coordination mechanisms for policy implementation and monitoring. However, such framework needs flexibility to be easily tailored to different local/regional contexts and demands. It is therefore important to build upon existing initiatives and partnerships among relevant actors at the local, subnational and national levels, so as to scale-up existing funding opportunities and ensure a common vision for long-term sustainable outcomes with environmental, economic, and health perspectives.

Since cities and regions in different parts of the world have different levels of understanding and data collection vis-à-vis food systems, the first step to accomplish these outcomes would be holistic mapping and assessment. The

Food and Agriculture Organization of the United Nations (FAO) in collaboration with RUAF Foundation implemented a city-region food system assessment in [Lusaka, Zambia](#). According to the assessment, 60% of the food consumed in Lusaka comes from the city region, which provides the main commodities consumed by the urban population (fruits, vegetables, livestock, dairy products, and fish). Despite that, there is no single existing institution mandated to govern the food system within the city region and the current fragmented governing bodies scarcely collaborate.



A woman preparing and selling hot food from the back of her bicycle in Shanghai. © By Daniel Case

Multi-stakeholder platforms, such as **Food Policy Councils**, could provide a forum for stakeholders to meet and build common ground while empowering grassroots movements where innovative social, environmental, and economic policies are created. In the case of Lusaka, the establishment of a Food Policy Council could support the city to identify and implement interdisciplinary solutions for policy making. This would be necessary to balance the different forces and institutional relations (formal and informal) currently shaping the food system ensuring fair representation, transparency, and accountability.

The Mozambican coastal city of Quelimane is currently undertaking rigorous multi-purpose climate resilience measures responding to a variety of challenges, including food security. In a country where one fourth of the population suffers from malnutrition (WFP, 2018), prioritizing the resilience of food systems can truly make a difference. Quelimane decided to centralize its food system policies and strategies under the Department of Agriculture, Livestock and Food Security. The department works actively with different stakeholders to improve the urban food system, including universities, NGOs, private sector, and small producers. Farmers associations are established within communities in rural and peri-urban areas enabling them to develop mutual-help activities and receive support from Municipality officials. Additionally, the group also receives training on the importance of organic and non-chemical food production, crop diversity, as well as food waste composting encouraging farmers to cut food loss.

"Sea level rise and erosion are a huge problem in my city as we have less and less land available for agricultural use."
Manuel de Araujo, Mayor of Quelimane in an interview to DW Resilient Cities 2018 (Wecker, 2018)

From linear to circular: Connecting resource-efficiency with urban resilience

According to the EU definition, circular economy is *"a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling, in an (almost) closed loop, where products and the materials they contain are highly valued"* (EU, 2016). Unlike the traditional economic model of single-use consumption, in a circular economy the aim is to preserve the value of materials for as long as possible by repurposing for example, products deemed as waste. In such a way, reducing and managing waste is a central component (though not the only one) in the vision of a circular development, which promises to spur innovation and economic opportunities, while at the same time yield environmental and climate resilience benefits.

For all these reasons, such transition toward circular ways of development is in the interest of cities and regions, where the bulk of the world population and economic activity concentrates. As recommended by the recently launched report *"The Weight of Cities: Resource Requirements of Future Urbanization"* prepared by the International Resource Panel, cities need to take action to assess and fully understand resource flows. Better-informed decisions can enable them to shift from "linear" to "circular" urban metabolisms, encourage more sustainable lifestyles and promote the transition to more resource-efficient urbanization. For emerging cities in China, India, and Nigeria, for example, it is essential to effect change now and start building cities differently. It is imperative that cities learn from past mistakes, as well as from each other, and invest in systems and sectors that are durable and regenerative.

Although [cities invest](#) a considerable amount of their budgets on waste collection and disposal, inefficient waste management continues to result in economic loss and substantial impacts on health and the environment. The implementation of policies and programs to minimize waste should be coupled with significant changes on how resources are extracted, transformed, recycled and reused, and with a clear vision of creating job opportunities and increasing revenues for local population. The complexity of such transition lies in the necessity to invest in technological innovation; promote and maintain political engagement; apply sustainable financial models; build institutional capacity, and instigate socio-cultural and behavioral change through awareness raising and education.

Peterborough, UK created the *Circular Peterborough Initiative* and committed to operate as a truly circular city by 2050 proposing seven steps to drive a more effective use of finite resources: Rethink; redesign; repurpose, reuse and share; repair; remanufacture; recycle; and recover (Future Peterborough, 2016). Peterborough's example could trigger others to follow, as cities and regions across the world carve out their path to achieve the SDGs.

Strengthening resilience through socially cohesive communities

Understanding how social and economic inequalities are embedded in cities is crucial in order to overcome them. Thus, pursuing social cohesion as a way to mitigate urban disparities is a decisive factor for increasing communities' resilience to shocks and stresses, including climate change impacts. Fostering collaboration and co-producing knowledge to better understand what facilitates or constrains cities in attaining more just societies is suggested by the *Realising Just Cities* program as an initial step in the direction of understanding social cohesion (Mistra Urban Futures, 2018).

According to a [pilot research](#) measuring social cohesion, when the attitudes, institutions and structures which sustain peace are in place and operating properly, cities may become more resilient to societal shocks, more ecologically sound, and may face less violent protests, riots and civil unrest. Said enabling environment may empower communities to influence policies and improve decision-making to shape more equitable, livable and ecologically sustainable societies. How is this achieved in practice?

[Quelimane, Mozambique](#), shifted from focusing only on poverty reduction and socio-economic development to a climate compatible development approach in which these aspects are integrated into the local adaptation development with community engagement during planning, implementation, monitoring and evaluation phases of the Coastal City Adaptation Project (CCAP), supported by USAID. By planting new mangroves in the poorest parts of town, for instance, the project aims to yield opportunities for social justice and financial gain for the predominantly female residents of these areas tasked to manage the seedlings and plants.

In [Zamboanga City, Philippines](#), vulnerable coastal communities are often affected by typhoons, floods and landslides. This is aggravated by the increasing influx of migrants and internally displaced persons (IDPs) due to the scarcity of land available to accommodate the new populations. The city has been striving to ensure access to affordable services and infrastructure; to stimulate job creation for both host communities and IDPs; and to introduce the latter to the local culture within an already ethnically-diverse urban environment.

Since November 2016, [Somalia](#) recorded 1.6 million IDPs escaping from a severe drought and 56,000 repatriated Somali refugees from Kenya's Dadaab camp. Most of the IDPs and returnees settled in the urban areas of Mogadishu and Baidoa. With the help of the World Bank, local governments spearheaded inclusive urban development by engaging with host communities for co-designing solutions to adapt to the new urban conditions (diverse, disparate groups of people with different interests). Understanding social capital dynamics and identifying common norms and values shared by both IDP and host communities is a critical factor to facilitate cooperation between groups while enabling equal access to scarce resources – which is fundamental for building trust among each other. Hence, the implementation of a well-crafted analytical framework of urban resilience is recommended to precede action, so as to enable a rapid shift from humanitarian action to longer-term socially cohesive urban environment.

Citizen participation is at the heart of such vision. [Copenhagen, Denmark](#) has a long-standing history of organizing active dialogues between citizens and planners to upgrade socially-marginalized neighborhoods, such as the St. Kjelds Quarter, and transform them into green, climate-adapted and integral parts of the city. Istanbul Metropolitan Municipality, Turkey is following the example of Copenhagen in its inclusive, citizen-centered approach to implement its Urban Transformation Project (see page 15). Such government efforts to directly engage citizens should ideally trigger bottom-up monitoring mechanisms that would ensure the “participation” is genuine and the outcomes of the policies and plans are strengthening social cohesion and community resilience.



Manuel de Araujo, Mayor of Quelimane, Mozambique and Co-chair of ICLEI Resilient Cities Portfolio



Andrés Isch, General Planning Secretary, Municipality of Quito, Ecuador presenting citizen participation mechanisms in Quito Metropolitan Area

Reality Check Workshop: Istanbul, Turkey

Achieving sustainable, resilient, and citizen-centered urban transformation

Serving as a bridge for two continents, Istanbul Metropolitan Municipality (IMM) is Turkey's demographic, economic, and cultural hub. With more than 14 million inhabitants, Istanbul has already overtaken London as Europe's largest city and is currently the fifth largest metropolis in the world (Euromonitor International, 2018). However, the city's rapid population growth, paired with its earthquake-prone location (situated on the North Anatolia Faultline) preponderantly requires for incisive urban resilience planning and transformative actions.

In 1999, [Istanbul](#) experienced the deadly Kocaeli earthquake, which hit Northwestern Turkey with a magnitude of 7.6 Mw demolishing 150 buildings and claiming the lives of 17,000 people. Four years later, in an attempt to address future earthquake risks and uncontrolled land use, the IMM launched the Earthquake Master Plan (IMM, 2003). The Plan was based on findings from a study on city-wide disaster prevention and mitigation supported by the Japan International Cooperation Agency (JICA/IMM, 2002) and covered several areas of intervention, such as retrofitting and reconstructing buildings, and developing institutional and technical capacity to mitigate future seismic risk.

In subsequent years, the city developed detailed hazard maps, launched several micro-zonation projects, conducted loss and damage analysis, and applied the megacity indicator system for disaster risk management (MegalST) for assessing its physical risks in a holistic way (Menteşe et. al., 2015). As a result of these efforts, the metropolis has emerged as a pioneer in earthquake mitigation by acknowledging the constant and inherent risk of its geological position and by taking determined steps to avoid a large-scale catastrophe while focusing on the well-being and priorities of its citizens.

From earthquakes prevention to 360° resilience

With the introduction of the 2004 Law on Metropolitan Municipalities, Turkish municipalities like Istanbul obtained greater responsibility for urban planning, hence improving their capacity to cover and address fundamental concerns, such as disaster resilience. Due to this newly unleashed capacity, the Istanbul Metropolitan Municipality expanded its area of intervention from narrow earthquake prevention to the more comprehensive and district-level focused Istanbul Urban Transformation Master Plan (IKDMP).

The development of the Plan has incorporated input from district municipalities, academic researchers, civil engineers, and NGOs, and has placed more emphasis on long-term economic and population growth requirements whilst maximizing the quality of life for all residents. The financing for the implementation has been secured from a variety of sources, such as local and international funds, long term credits, as well as public and private investments.

A pilot Urban Transformation Project in Istanbul's Bayrampaşa District was recently launched to implement components of the IKDMP. The aim of the project was to transform the District into a green, livable and resilient part of the metropolis by applying the "Build-Transfer-Evacuate" Model. The Model entails constructing new safe buildings in unutilized state-owned areas, such as the District's former prison area [Build]; relocating the population of the adjacent risk area [Transfer/Evacuate]; and after demolishing constructions in the risk area, re-creating the empty space according to sustainability principles and citizens' needs. Much like a sliding puzzle game, this simple concept could support Istanbul's citizen-centered transformation vision. However, all puzzle pieces have to fit! Stakeholders of the transformation project included the private sector (e.g. realtors), the metropolitan government, as well as civil society groups such as a reconciliation committee. One of the most successful and thriving elements of the project has been the active consultation of citizens. By placing people at the focus and prominently relying on social studies, the physical structure of the project was shaped around the citizens' true priorities, such as the creation of a mosque square, proximity to social infrastructure, green corridors, and commercial streets.



Delegation from Istanbul Metropolitan Municipality presenting the pilot Urban Transformation Project in Bayrampaşa District



Istanbul landscape. © By Pixabay

Evidence-driven, data-based urban resilience planning and action

New scientific knowledge on climate change has the potential to cast light on emerging and prevailing issues and galvanize action for sound policy-making and innovative ways of addressing problems while getting multiple stakeholders to agree on the urgency of the necessary measures. The cornerstones of climate science are **accurate data** and **partnerships** that bring forward evidence from various sectors, levels of governance, and realms of society. At the local level, scientific evidence and practitioner expertise may well enhance resilience and adaptation efforts and empower communities to be part of the collective solution.

Resilient Cities 2018 took place a little over a month after the historic CitiesIPCC conference (5-7 March 2018, Edmonton, Canada), which concluded with a first draft of a global research agenda on cities and climate change to be implemented by the Intergovernmental Panel on Climate Change (Cities IPCC, 2018). Participants of Resilient Cities had the chance to discuss the outcomes of the CitiesIPCC, existing gaps and needs, and opportunities for enhanced knowledge through technological advancements (e.g. geospatial mapping) and human-sourced data (e.g. informal settlements mapping) with members of the [Scientific Steering Committee](#) and CitiesIPCC partner organizations.

A key challenge in advancing on the ambitious outcomes of the CitiesIPCC is to reconcile the unsystematic, non-peer reviewed, locally-sourced adaptation knowledge in cities with the formal, conventional science world. Through the [EPIC-N model](#) annual multidisciplinary local university courses are connected to city projects with the aim of providing applicable solutions for the needs of the local community. Such model benefits both the local officials by bringing knowledge to their doorstep and academics by helping them ground truth their research and produce actionable evidence-based support to cities. Due to its highly adaptable nature, the EPIC Network counts over 30 projects worldwide, including in [eThekweni/Durban, South Africa](#), where the EPIC partnership is piloted within the **Palmiet River Rehabilitation Project** involving young eco-champions and representatives from the informal communities living in the area.



David Dodman (left), Lykke Leonardsen (center), and Anthony Succi (right) during the session CitiesIPCC: Science for effective city climate action and resilience building

Urban dwellers living in slums and informal settlements hold valuable and untapped resilience and adaptation knowledge that could support local governments' resilience efforts. For example, through the **Know Your City Campaign** (KYC) 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 (SDI, 2016). Profiling over 7,000 slums in over 200 cities, KYC generates high-quality, detailed, disaggregated, and **open data** available at the city scale. As such, 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. For example, SDI and Global Infrastructure Basel (GIB) Foundation collaborate on an [innovative award-winning project](#) that combines KYC data with SmartScan, a tool that allows rapid assessment and aims at avoiding risk and improving infrastructure projects. Such "marriages" between innovative tools and community-driven knowledge attempt to close the gap of knowledge and influence public and private sector investments toward more inclusive decision-making.

"To create a partnership with the community is to consult with the community... We are partners, not beneficiaries!" Rose Molokoane, Coordinator of the South African Federation of the Urban Poor and member on the Management Committee of SDI

Lack of and access to accurate information and systematic data – especially for cities in the Global South – is a persistent challenge that needs to be addressed in order to advance the global sustainability agenda. Though there is a wealth of information globally, this does not necessarily translate to knowledge. Tailored, scalable, and context-relevant information for effective and timely climate action at the local level is missing. The use of [Earth Observations](#) (EO) and geospatial data and their integration with other community-driven information sources could step up to the challenge. These technological innovations could be used to back evidence-based climate resilience planning at all levels and effectively track the progress toward the implementation of the SDGs.

"Countries and even cities have borders and administrative boundaries, Earth Observations do not." Steven Ramage, Head of External Relations, Group on Earth Observations, Geneva, Switzerland

For instance, the National Administrative Department of Statistics in Colombia (DANE) has piloted a project that incorporates available Landsat images with statistical population data to investigate the relationship between land consumption and population growth in the Barranquilla Metropolitan Area (CEPEI, 2017). The outcomes of the project support the measurement of land use efficiency which constitutes an SDG indicator. This is just one example of how to harness the potential of EO for the implementation of the SDGs.



Robert Kehew (left), Climate Change Planning Unit Leader at UN-Habitat and Rose Molokoane (right), Coordinator of FEDUP & Vice President of SDI discussing Knowledge, data and action to shape inclusive urban resilience investments for slum dwellers

Lastly, providing open access to EO data could further knowledge sharing, citizen engagement and partnership building by enabling different sectors (e.g. local communities and spatial technology developers) to engage and co-create solutions. For example, *resilience.io* – an open source, integrated systems modeling and core component of the *Resilience Brokers program* – allows for smart collaborative decision making for policy and investment in cities and regions around the world (Resilience Brokers Ltd, 2018).

Key takeaways from the discussion at Resilient Cities 2018 are:

- Collection, (co-)creation, and sharing of scientific knowledge and accurate data needs to be significantly improved so as to allow more stakeholders to be part of the information source and information receiver.
- The development of a joint research agenda among city resilience practitioners and scientists/academics could help reshape the way science and (local) politics work together.
- Technological advancements, such as satellite remote sensing and other EO, could deliver key information to support climate resilience planning, implementation, as well as monitoring and evaluation of progress on the SDG trajectory.
- At the same time, human-sourced, community-owned data – especially generated in slums and informal settlements – match advanced technological datasets in the wealth of information and accuracy on socio-economic and resilience conditions they produce.
- Innovative partnerships need to be stimulated to support the generation of new and the preservation of established knowledge. Public and private sector, academics and practitioners, local/subnational and national levels of governance need to coordinate and integrate systems of knowledge to advance the common vision for sustainability in the future.
- Delivery of such targeted research agendas to national and global conversations and ensuring that global decisions are backed by local contexts is crucial for the advancement of the SDGs.

From theory to action: A global framework to foster cities-insurers collaboration

The problem: Disconnect between local governments and the insurance community

The global situation currently could be characterized by disconnect between the insurance industry and local governments. Local governments tend to approach companies to insure already existing infrastructure, generally due to lack of financial/insurance literacy and accurate data. Furthermore, this often reflects a broader vicious circle: Municipalities plan for new infrastructure development without the insurers' wealth of data and expertise, who in turn find public assets too risky to insure and consequently offer higher premiums. Most cities – especially in the Global South - tend to perceive insurance as an unnecessary luxury. After a catastrophe occurs, however, municipalities spend large amounts for reconstruction and future risk-reduction measures. A more effective and proactive model would be to work together *before* the disaster strikes.

The potential answer: Harnessing the wider role of the insurance industry and working together

Insuring a public city asset does not automatically result in more sustainable and resilient solutions; it only transfers the risk – the potential financial burden arising from fortuitous events – from the local government to a bigger entity. The vehicle for the transfer is the insurance premium.



Mia Ebeltoft (left) from Finance Norway with Ole Jørgen Grann (center) from the Norwegian Association of Local & Regional Authorities and Ermin Lucino (right) City Planner from Santa Rosa at the Resilient Cities 2018 congress



Butch Bacani, UN Environment's Principles for Sustainable Insurance Initiative announcing the launch of the Insurance Industry Development Goals for Cities at the ICLEI World Congress 2018. © By Éric Carrière, Ville de Montréal

Yet, the insurance industry could offer much more than mere insurance schemes. Insurers are in a unique position to leverage and incentivize local governments to undertake appropriate preventive measures, since they act on three key fronts: As **risk managers**, **risk carriers**, and **investors** in sustainable and resilient solutions (ICLEI, 2017a).

Therefore, to meaningfully contribute to a comprehensive disaster risk management and toward a sustainable and resilient urban future, insurers need to co-design infrastructure with local governments. Aiming to move from theory to action, UN Environment Principles for Sustainable Insurance (PSI) and ICLEI jointly developed at Resilient Cities 2017 the first ever *Insurance Industry and Cities Summit*, which successfully brought together the two stakeholders, providing them with a global platform to explain each other's key roles and priorities, to identify challenges and opportunities for cities (ICLEI, 2017a).

In 2018, insurance and local government leaders returned to Resilient Cities to further validate the emergent roadmap of collaboration. The conversation steered toward the obstacles and potential ways to overcome those in the way of such collaboration. A key aspect that stood out was the **sharing of insurance loss data**. If such crucial information is shared by insurers, local governments – especially those that lack the technical and financial capacity to obtain such data – could increase their understanding of their risk and re-share their planning accordingly to avoid major losses. Innovations by the insurance industry could prove to be valuable tools for cities' herculean efforts to build resilience and achieve the SDGs by 2030. For example:

- **Social Impact Bonds**, an innovative financing mechanism whereby an entity (e.g. local government) enters into agreement with investors to pay for the delivery of pre-defined social outcomes (e.g. pollution reduction).
- **Resilience Bonds**, a mechanism whereby insurers provide necessary financial liquidity to local governments to undertake resilience measures (e.g. flood barriers) and at the same time, as cities capitalize on the savings from avoided disaster (as a direct outcome of the flood barriers), their premium is reduced to reflect the resilience outcome to be achieved.

The core priority: A global action framework to foster dialogue, guidance, and collaboration

The Insurance Industry Development Goals for Cities

1. Build climate and disaster-resilient communities and economies
2. Promote healthy lifestyles and prevent pollution
3. Develop solutions for unserved people and enterprises
4. Protect natural and cultural heritage sites
5. Promote sustainable energy and resource efficiency
6. Leverage data, risk analytics and technology
7. Promote risk management, insurance and financial literacy
8. Help develop climate and disaster risk management strategies and plans
9. Help develop sustainable insurance roadmaps for cities
10. Promote the Insurance Industry Development Goals for Cities

Read more on the Goals on www.unepfi.org

This powerful and effective dialogue between local governments and the insurance industry, following a year-long consultation process, eventually led to the co-creation of a global action framework for the insurance industry to help achieve the SDG11. **The Insurance Industry Development Goals for Cities** officially launched at ICLEI's World Congress 2018 in Montreal, Canada are a big step toward bringing the two worlds together and help them advance urban resilience globally.

Emerging challenges in urban resilience: The resilience of digital cities

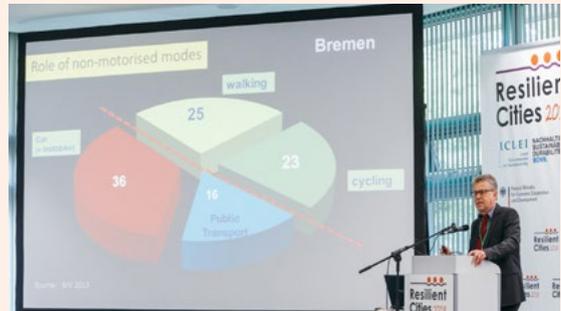
Section written by Ina Schieferdecker, a Member of WBGU, Director of Fraunhofer FOKUS and Professor at TU Berlin. Ina is also member of the German Advisory Council on Global Change and Spokesperson of the Smart City Network Berlin.

We live in the century of the cities. Hence, there is an urgent need to optimize the processes within a city and push for new innovation and business-oriented “ecosystems” generating novel operational and business models and increasing quality of life and work, whilst at the same time meeting sustainability goals. Thereby, Information and Communication Technology (ICT) plays a vital role in enabling urban environments that may emerge around the notion of data/information gathering and making this data/information available across multiple domains towards the combination and exploitation of synergies amongst various aspects of urban processes and everyday life.

According to a study on mapping smart cities in the EU by DG Internal Policies 2014, **smart cities – also called digital cities – are cities seeking to address public issues via ICT-based solutions on the basis of a multi-stakeholder, municipality-based partnership.** In this context, ICT is used as the enabler for the interlinkage between urban and municipal systems, e.g. for mobility, energy or heat supply, logistics or safety management. Such interconnected systems enable holistic and flexible solutions. For example, they could prevent construction sites or hazardous weather conditions from obstructing traffic flows or compromising public safety during a cultural event in a city. New forms of problem resolution become possible with ICT as citizens, tourists, operators and/or emergency forces can be easily and directly informed according to their needs and preferences, and can also easily communicate and cooperate.

The general lack of awareness about the security risks associated to digital technologies was the starting point of the conversation which took place at Resilient Cities 2018. Issues that were discussed through expanded far beyond the real threat of cybersecurity, data protection and risk management in the digitalization era, toward concepts of governance and open systems, automated and (semi/fully) automatized systems and their correlation to urban resilience.

However, it was made clear that cybersecurity is a growing concern for local governments, which are the owners of valuable personal data – from welfare benefits to parking fines – and serious measures need to be taken to protect citizens from attacks in an ever digitalized world.



Michael Glotz-Richter from the City of Bremen on the topic of autonomous driving as a future challenge to cities' resilience

“It’s only a matter of time before you have problems and so we should deal with (cyber-attacks) like a natural catastrophe – you know it will come and you have to be prepared.” Thomas Stasch, Head of IT-Security and Civitec-CERT at Civitec, Siegburg, Germany

Urban platforms to enable interlinkages of information flows

Like an operating system for a computer or an electronic device, an **urban platform** provides common means, services and features to construct such ICT solutions in an effective manner. It is comprised of several layers that define how to digitalize urban infrastructure systems, interconnect them by communication networks, manage their assets and operational services, manage data and provide data analytics. Above this urban data layer, integration, choreographies, and orchestrations are used to construct generic municipal services, such as stakeholder engagement and collaboration. Like the ability to offer and use services, **privacy and security** are cross-cutting and central aspects of all these layers (DIN, 2017).

Along with the further proliferation of digital solutions, automated and autonomous systems are increasingly taking on complex monitoring and control tasks and make their “own” decisions in society, business and the public space. They make our societies, organizations and individuals more dependent on interconnected, digitally-controlled technical infrastructure. As **municipalities go from plain solution providers** (in terms of services for local stakeholders and citizens and supporting digital applications) **to platform providers** (in terms of public IT and digital urban infrastructure), new vulnerabilities in the so-called critical infrastructure of urban spaces may evolve. Therefore, it is of utmost importance to secure digitalized infrastructure by design and to maintain security throughout.

“Openness allows cities to build on the work and best practices of others by re-using others’ components and solutions. For municipalities with limited ICT resources and capabilities it should be top priority to rely on open standards and on ICT”



Peter Head (left), Founder and CEO of The Ecological Sequestration Trust, and Ina Schieferdecker (right), Member of WBGU, Director of Fraunhofer FOKUS during the Opening Plenary

One well-established solution is to “open” the digitalized infrastructure by following open standards (readable by everyone), offering open interfaces (digitally accessible by everyone), and – if possible – using and/or providing open source (reusable and readable by everyone) platforms. Simply put, open systems are: “*system(s) in which the components and protocols conform to standards independent of a particular supplier*” (English Oxford Living Dictionaries, 2018). They facilitate the interoperability amongst multiple vendors, as well as the security of the overall solution. Security is even more fostered with open source.

Altogether, **open urban platforms** utilize open interfaces based on open standards, in order to ensure interoperability and compatibility to platform or system components of various vendors as well as to other urban platforms. In such a way, they enable urban resilience. Openness allows cities to build on the work and best practices of others by re-using others’ components and solutions. For municipalities with limited ICT resources and capabilities it should be top priority to rely on open standards and on ICT solutions with open interfaces and formats. There is no need to re-invent similar things, but rather an opportunity to reuse, customize and adapt existing resources to the administrative needs of a municipality.

Good governance for resilient cities data

Besides these technical requirements we need to ensure that the digital transformation of cities is embedded in appropriate urban governance that supports the implementation of the Agenda 2030. To this end, **four key guidelines** were established in the **Smart City Charter**, developed by Germany’s Smart Cities Dialogue Platform (BBSR/BMUB, 2017). According to the Charter, digital transformation requires:

1. Goals, strategies, and structures
2. Transparency, participation, and co-creation
3. Infrastructure, data, and services
4. Resources, skills, and co-operation

The flagship report of the German Advisory Council on Global Change (WBGU) on global digitalization and sustainable development (forthcoming 2019) will also address the question of how the digital transformation can be integrated into urban development in a way that meets the needs of the population majority. The concept of **technology sovereignty** is in this regard an indispensable prerequisite: City administrations and urban stakeholders need to build capacities and technological knowledge to make sure that the selected urban technology pathways are a valuable contribution to common welfare.

In view of the expected massive expansion of infrastructure in the urban century, the challenge from the onset lies in avoiding unsustainable path dependencies. New homes and digital urban infrastructure will have to be built at great speed for approximately 2.5 billion new city dwellers by the middle of the century (WBGU, 2016). Digitalization can play thus a decisive role to assure a prosperous urban future without leaving anyone behind, provided that the process is controlled and driven by a joint effort of urban stakeholders and city administrations.

Outlook for 2019

Section co-authored by Guilherme Johnston, ICLEI Global Coordinator Resilient Cities and Monika Zimmermann, ICLEI Deputy Secretary General

2019 will mark the 10th anniversary of the Resilient Cities congress and a moment to reflect on the future focus of urban resilience in general and the congress series in particular.

ICLEI's considerations can be summarized as such:

- **Supporting the resilience building of local and regional governments is more relevant than ever.** When ICLEI coined the term “Resilient Cities” in 2001, no one thought that the intensity and speed of global warming and its impacts would be so prominently visible in less than 17 years.
- **Resilience building can be seen as an early warning system.** When screening potential risks and developing responses, we identify possible future challenges and strive to counter these before they become major shocks and stresses.
- **The review of our local resilience status globally must be scaled up.** Are the current local resilience strategies successful? Or do new problems grow faster than we can tackle them in a traditional way? How can we fine-tune our methodologies? Which stakeholders to involve and how to finance implementation?
- **Global and regional Resilient Cities congresses are assets.** Encouraging regions – particularly from the Global South – to develop forums tailored to the regional/local context will ensure the legacy of the Resilient Cities congress as valuable platforms for exchange.

Emerging themes in urban resilience:

While resilience is not the same as “sustainability” (but a key component of it), the range of issues falling under urban resilience building increases. A snapshot is provided below:

- **Impacts of digitalization:** Who manages the collected Big Data and how to ensure that these are used to the benefit of communities? Are cities getting more or less dependent and vulnerable if they manage their operations from single data centers? What are the impacts on traditional jobs and the wellbeing of citizens? Should cities consider Universal Basic Income (UBI)?
- **Infrastructure for the future:** Which approaches to infrastructure development can respond to needs and uncertainties at the same time? How can technology and innovation help address these challenges?
- **Health and health systems:** How can cities safeguard human health and life?
- **Integrated action:** How to deal with conflicts between disparate resilience strategies? How to integrate strategies with other levels of governance in order to ensure a shocks-resistant metropolitan region?
- **Demographic developments and public services:** How can a city prepare for major demographic shifts (aging or extremely young society)? How to ensure continued public services under financial constraints?
- **Resettlement:** How to re-design districts with a resilience lens and what to do with uninhabitable areas?
- **Forced migration:** How can cities address large influxes of forced migrants? How to ensure inclusion and social cohesion?
- **Coastal cities' vulnerability:** How to deal with the gentrification of coastal areas? How to attract innovation?
- **Tourism:** What is the impact of mass tourism on the social cohesion and disaster-resilience of a community?
- **Major shocks:** How to prepare for major shocks, such as terrorist attacks? How to engage the community as effective volunteers when such an event occurs?
- **Hot cities:** How can cities prepare for heatwaves and the impacts these have on the local (vulnerable) population, infrastructure, and incidence of urban and forest fires?

New types of responses needed:

- **Comprehensive local resilience strategies:** How comprehensive should these be to remain action-oriented?
- **Citizens' voluntary emergency response:** Can cities replicate successful systems where essential resilience stakeholders, such as firefighters, provide surge capacity on a volunteer basis to respond to emergencies?
- **Community and religion-based strategies:** How can religion act as catalyst and community aggregator for improved social cohesion and climate action?

By orienting their activities based on the considerations outlined above, cities, towns, and regions could advance on a **resilient development pathway** – one of the five critical and strategic pathways for achieving a sustainable urban world launched at the ICLEI World Congress 2018.

Resilient Cities 2018 congress at a glance

About the congress

The Resilient Cities congress is a global platform that allows practitioners and experts to share local advancements toward adopting and implementing integrated, sustainable, and resilient urban development plans, including progress toward the resilience targets of SDG 11. Since 2010, representatives from over 250 local governments have attended the congress, which has served as an opportunity to exchange best practices and innovations, build partnerships, and connect with international resilience stakeholders.

For the ninth consecutive year, ICLEI and the City of Bonn co-hosted the Resilient Cities congress at the Gustav-Stresemann-Institut in Bonn, Germany. On 26 – 28 April, Resilient Cities 2018 brought together over 400 participants from 48 countries and 89 local governments (representing 22% of the total participants), as well as representatives from international and non-governmental organizations, the public and private sector, research institutions and academia. The congress program featured local case studies, best practices, and urban resilience initiatives from around the world. New research and innovations were shared building capacity of local and regional government participants and expanding new directions in the field of resilience and adaptation to climate change.



Congress composition

- 37 thematic sessions including panels, presentations, workshops, and other interactive formats;
- 2 plenary sessions: The Opening Plenary on *"Resilient urban futures: Where we are and where we need to go"* and the Summary and Outlook Plenary on *"Measuring progress, enhancing action & anticipating future urban resilience challenges"*;
- A special sub-plenary on *"Driving transformative climate change adaptation in cities through nature-based solutions"*;
- A Reality Check Workshop featuring Istanbul Metropolitan Municipality, Turkey;
- 3 City-in-Focus sessions featuring local government adaptation and resilience plans;
- A Region-in-Focus session featuring Louisiana State, USA;
- 14 posters presented during two dedicated sessions;
- 10 exhibitors present throughout the three days; and
- Special congress elements, including an Opening Reception hosted by the City of Bonn, a Mayors Lunch and a Talanoa Dialogue and Dinner.



In focus from left to right: Franz Marré (BMZ), Ashok Sridharan (Mayor of Bonn), and Particia Espinosa (UN Climate Change) at the Opening Plenary on April 26th

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