SHARED SCIENCE SHARED FUTURE

SUMMARY FOR
URBAN
POLICYMAKERS

ACTION AGENDA

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Introduction: Co-Creating Knowledge

Human influence has warmed the planet, and widespread and rapid impacts are occurring to both natural and human systems in all regions of the world. In response, immediate action is needed if humanity is to limit global warming to 1.5°C or well below 2°C above pre-industrial (1850-1900) temperatures, as well as prepare for and adapt to current and future risks. The 6th Assessment Report cycle (AR6) of the Intergovernmental Panel on Climate Change (IPCC), with its three main assessment reports and three special reports, offers the most current and comprehensive scientific understanding of the climate crisis.

With the intention of bringing critical science and policy action together, the Summary for Urban Policymakers (SUP) Initiative released three summary reports in November 2022: *What the Latest Physical Science of Climate Change Means for Cities and Urban Areas*, distilled from the IPCC Working Group I report; *What the Latest Science on Impacts, Adaptation and Vulnerability means for Cities and Urban Areas*, distilled from the IPCC Working Group II report; and *What the Latest Science on Climate Change Mitigation Means For Cities and Urban Areas*, distilled from the IPCC Working Group III report. These volumes of the AR6 SUP Series were authored by IPCC AR6 cycle authors in their individual capacities, maintaining line of sight to the original reports, and in conversation with city officials, national governments, and business communities. They identify and highlight the most relevant science, and the associated actions, for urban areas in every region of the world.

This SUP Action Agenda captures the key findings from the SUP volumes, but goes beyond the SUP Series and the foundational IPCC reports to include inputs from city and business leaders. These inputs were gathered through a series of regional convenings, and include the actions necessary to realize the options set forward in both. While grounded in the scientific understanding of the climate crisis, this Action Agenda explicitly focuses on the policy and solution space, outlining both the opportunities for, and business investments required, to incentivize engagement from all relevant stakeholder communities. It also establishes neutral platforms that facilitate the partnerships necessary for co-created solutions to the climate change crisis. As distinct from the official SUP series, which is authored by the scientific community with input from practitioners, this Action Agenda is written from the perspective of city and business leaders and organizations that represent them. It is informed by and grounded in the knowledge derived from the findings of the SUP process, and with the goal of establishing a long-term platform to co-create and scale urban solutions based in science.

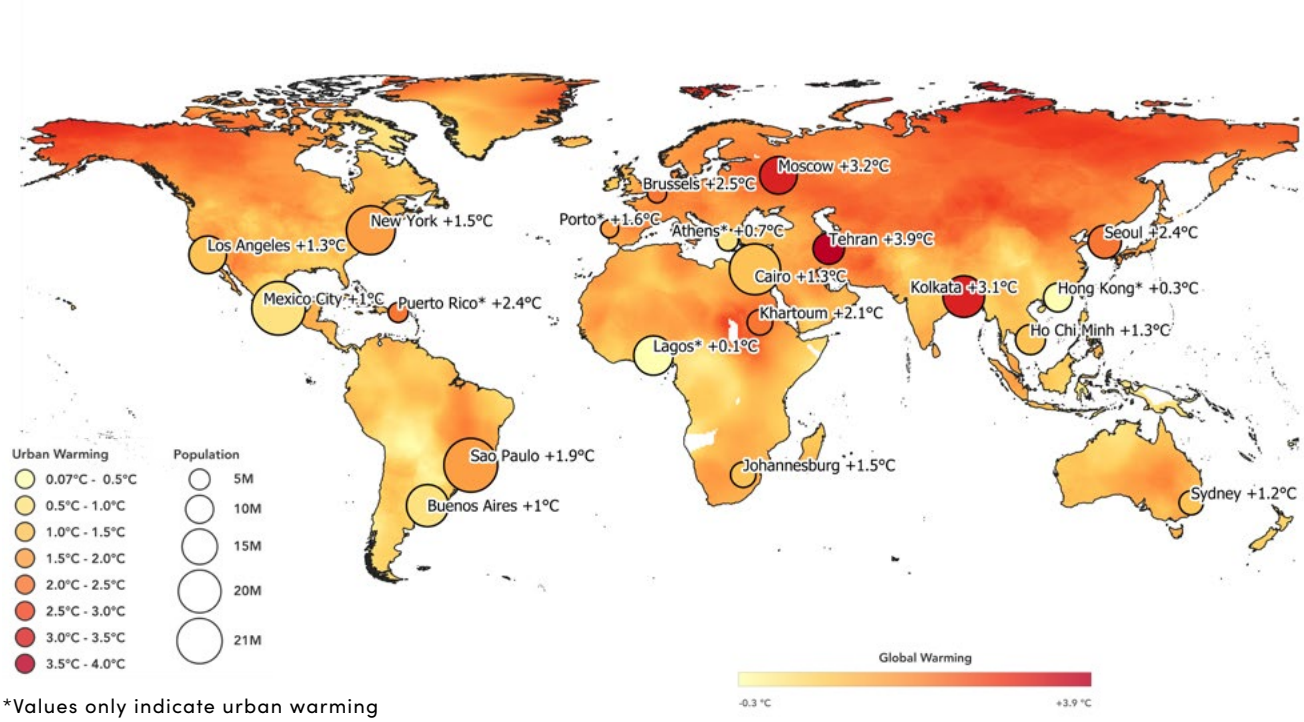
What the Science Says

Human actions are warming the globe and the resulting impacts on both natural and human systems are occurring everywhere in the world. Volume 1 of the SUP Series, distilling the work of the AR6 Working Group I, noted: "Even with immediate stringent CO_2 emission reduction, decreased emissions will continue to add to the planet's cumulative CO_2 budget. This will lead to warming above 1.5°C in the next 20 years. However, without immediate deep reductions in greenhouse gas emissions (GHG), global warming will exceed 2°C by around 2050." As Figure 1 captures, this warming is experienced acutely, and often in more severe terms, in cities and urban areas. In some regions, such as West and South Asia and the Arctic, temperature increases in cities and urban areas have already exceeded 1.5°C. The urban geography of this warming, and the impacts that come with it, matters.

The global population has surpassed 4.5 billion, and is growing, with much of this growth expected in Asian and African cities and urban areas, particularly in informal settlements that house the most vulnerable and have high exposure to climate hazards.

While being sources of emissions and sites of impact, cities and urban areas are also sources and sites of solutions. With ongoing urbanization in the Global South, rapidly developing cities and urban areas, those regions that are at the early stages of urban development will require significant new infrastructure development, whereas established cities and urban areas across the world will need to retrofit, replace or rebuild aging infrastructure. The development and evolution of these cities and urban areas provides the opportunity to meet the climate change challenge.

Fig. 01: Past trends in global surface air temperature (1958–2018) with cities reporting significant temperature increases.



*Values only indicate urban warming

Source: Change in the annual mean surface air temperature over the period 1958-2018 based on the local linear trend retrieved from CRU TS (°C per 68 years). This map first appeared in SUP Series Volume 1, What the Latest Physical Science of Climate Change Means for Cities and Urban Areas. It was adapted from IPCC 2021, Chapter 10: Linking Global to Regional Climate Change. United Nations, Department of Economic and Social Affairs, Population Division (2018); World Urbanization Prospects: The 2018 Revision, Online Edition.

The growing global urban population is leading to a rise in demand for resources, infrastructure and services. These trends will determine the growth in emissions from urban consumption and production throughout the century. **The rate of urban emissions growth is not predetermined.** Depending on how they are built, retrofitted, and powered, for example, cities and urban areas can offer notable opportunities for energy efficiency when compared with other areas. By implementing mitigation action with speed, at scale and in an equitable manner, urban policymakers, civil society, and businesses can actively shape our climate future. Scientists and policymakers know this can be done. The necessary technology and policies needed to build liveable, resilient, net-, or near-net-zero cities and urban areas have been developed and used in many cities and urban areas across the world. What is more, the mitigation actions taken within cities and urban areas, especially with regards to consumption, can help reduce GHG emissions outside of urban boundaries.

While focused on limiting warming to 1.5°C, **urban policymakers must implement adaptation policies and plans** for global warming that is expected to reach 1.5°C in the next decades, could exceed 2°C with current implemented policies by 2050, and would reach around 2.5°C by 2100, even if all current pledges were implemented.

While hundreds of cities and at least 170 countries have integrated adaptation considerations into their planning processes, significant gaps in adaptation actions and knowledge remain. Approaches and gaps often differ by region. Nonetheless, transformational change should be a shared objective. By focusing on the reduction of poverty and inequality and enabling greater inclusion in urban decision-making and equity in the distribution of outcomes, transformational approaches to adaptation can link smaller, incremental steps to wider development efforts.

Systems transitions remain the essential building blocks to transformational change. Over the course of the AR6 cycles, five systems transitions have been identified: urban, rural, and infrastructure; energy; land, ocean, coastal, and freshwater ecosystems; industry; and societal transitions. The urban, rural, and infrastructure systems transition brings together energy, buildings, transportation, and land-use options within cities and urban areas. The societal systems transition, meanwhile, is one of the important developments of the AR6 cycle and offers demand-side strategies to reduce emissions and enable transformational adaptation. Taken as a whole, these systems transitions are interconnected, cut across sectors, and are most effective when implemented simultaneously. They include both mitigation and adaptation actions, which when pursued together can advance climate resilient development.

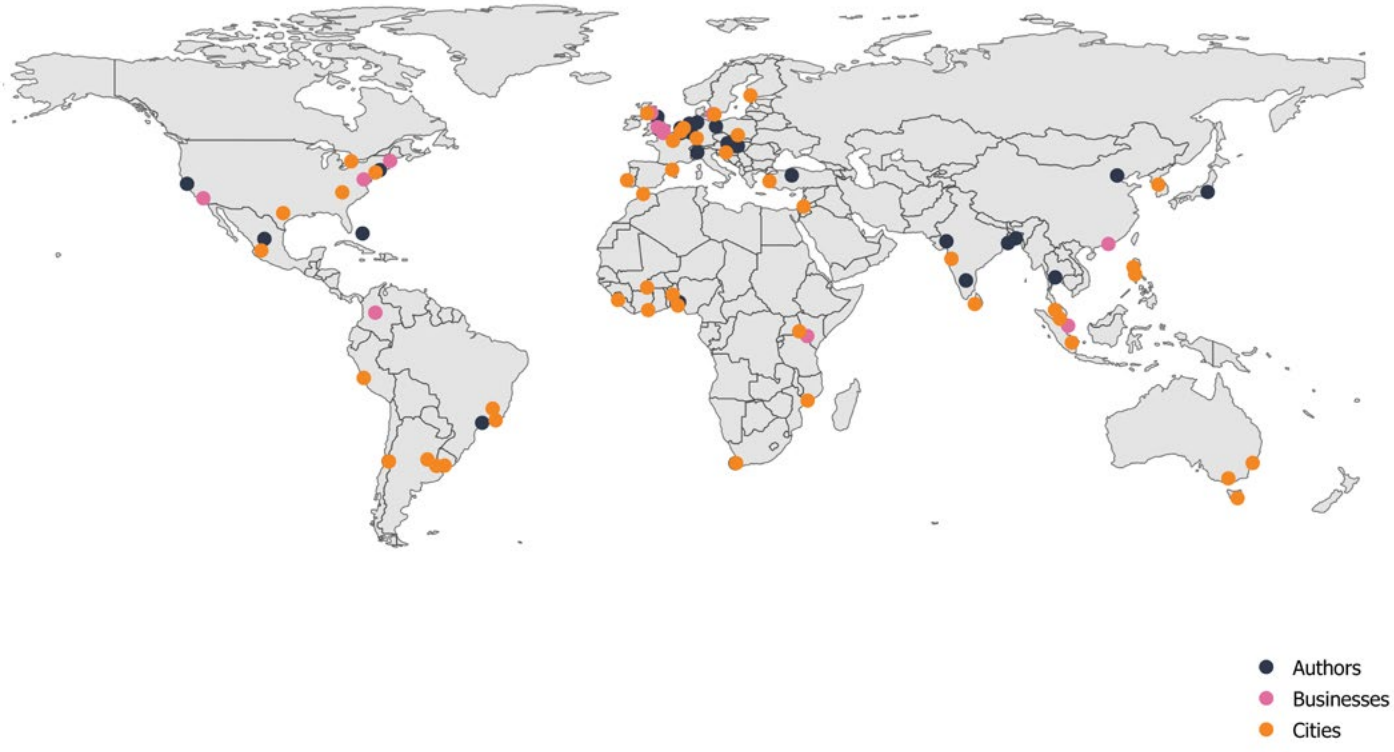
How can these systems transitions be made real? **Enabling conditions include the institutions, policies, investments, and engagement strategies needed to advance systems transitions and ultimately achieve transformation.** Essential enabling conditions relate to: urban policy and planning, governance, finance, lifestyle and behavior change, innovation, and technology. Importantly, climate action is enabled when governments, civil society, and the private sector, supported by science and the media, make inclusive development choices that prioritize risk reduction, equity, inclusion, and justice. These transitions are accelerated and more just when decision-making processes, finance, and actions are integrated across governance levels, systems, and timeframes. Properly developed, these enabling conditions can engage specific actors to implement change and increase both the efficacy and scalability of climate actions.

Climate resilient development is an important framework advanced during the AR6 cycle. It connects adaptation actions and mitigation with a view to achieving sustainable development. It includes a longer time horizon and involves a broad array of stakeholders. It seeks to accelerate deep transformational change and recognize multiple pathways with different synergies and trade-offs attached to specific actions and decisions. Adaptation and mitigation action, as well as sustainable development, are not mutually exclusive; they are interdependent processes. As Volume II of the SUP Series, distilling the work of the AR6 Working Group II, concluded: "Pursuing climate and development goals in an integrated manner increases their effectiveness in enhancing human, ecosystem, and planetary health."

The science assessed in the AR6 cycle added further depth and detail to the understanding of **climate change risks and impacts by region**, as well as a stocktake of adaptation and mitigation actions in cities and regions. Building on this, and consistent with the regional focus in AR6 reports, the SUP initiative in 2021-2022 convened city policymakers and business leaders to add their perspectives on impacts, challenges, and opportunities in their respective regions and cities. Their insights are captured in the next section.

What the Practitioners Say

Throughout 2022, the partners of the SUP Initiative – Resilience Rising, the Indian Institute for Human Settlements, Resilience First, the German Ministry for Economic Affairs and Climate Action, Deutsche Gesellschaft für Internationale Zusammenarbeit, and the Global Covenant of Mayors for Climate & Energy – organized a series of consultations with local government and business leaders during the development of the three volumes of the AR6 SUP series. Six of these consultations were regional in focus, four were global. They brought together city officials from 50 cities around the world, in addition to local and global representatives from 11 multinational corporations and more than 30 scientists from across the IPCC's three working groups – inclusive of the leadership or co-chairs from each. (All authors and co-chairs participated in their individual capacities).



SUP INPUT AND ITS LIMITS

For a variety of reasons, full city and business contributions could not always be fully incorporated into the SUP reports.

These include: the global nature of the SUP Series; the timelines involved in the IPCC assessment, which sometimes mean that new developments in science, technology, or policy innovation may not yet have made their way into the scientific literature; the primacy of peer-reviewed scientific evidence underpinning the IPCC process; and the interest of city and business leaders in going further than the IPCC's scientific findings to advance specific policy goals, collaboration, and action in their local settings and sectors.

This input informed the priorities for the SUP series and has now been integrated into the writing of the three official SUP products.

Science must be accessible and connected to core values. The full impact of science can only be realized if it is communicated in a way that enables action to be taken at the local level. This requires connecting the scientific case for climate action to the scientific evidence of impacts of action (or inaction) on individual quality of life and economic opportunities. Cities need a readily available 'library' of scientific evidence that resonates with the local community to justify and build support for local policy and investment decisions.

Climate justice and support to vulnerable communities is essential at the local level in almost every region. Cities and urban areas in the Global South, where most of the urban growth is expected, often bear the brunt of the impacts of climate change and yet remain vastly under-resourced. The growing global focus on equity and justice is important, but still needs to be significantly strengthened, within individual communities, at city and regional scale, as well as across the global context. This should include a more equitable distribution of financial resources and technology, and integration of new and different voices in the scientific process, including, but not limited to, further inclusion of local knowledge and Indigenous knowledge.

Cities cannot do it alone. While there is a growing level of commitment from cities and regional governments globally to meet aggressive climate targets, there are limits to local government jurisdictional authority. Few commitments can be fully realized through local government action alone. The science clearly identifies what should happen in cities and urban areas, and in some cases provides suggestions around regionally relevant approaches; but much of the literature does not adequately address the complexities of urban governance systems, or the most efficient approaches to manifest these changes across levels of government – local, regional, national, or international – or the role of the private sector as key stakeholders.

Gross disparities remain both in terms of data availability and scientific assessment across global regions and at city scale. These disparities are particularly evident for climate change adaptation and resilience building. Cities and urban areas would benefit from greater alignment of economic indicators, including return on investment, job creation, and other 'co-benefits' with climate change-related priorities. Further social indicators (such as human health, access to green space or transportation, or overall quality of life) and the integration of behavioral and social science, need to be strengthened.

Clear guidance on use of climate scenarios, and available data, is needed. Several plausible scenarios are included in the IPCC AR6 report related to future emissions, adaptation, and associated climate impacts. There is no clear direction for cities or businesses on which scenario to use, or when, to inform their decision-making process. Further, most cities lack adequately downscaled data to fully utilize global models for scenario and urban planning. Guidance on the scope and scale of 'actionable' data, including decision-making in uncertainty or developing proxy indicators in the absence of full data, would be valuable to inform and unlock local policymaking.

The 'latest science' does not always fully capture current activities, progress at the practitioner level, or the lived experience of local and Indigenous communities. Local customs and community practices, while potentially 'untested' or 'undocumented' to date, are also critical components of local climate action. Feedback loops need to be created to adequately and immediately input regionally-specific experience as well as knowledge captured in gray literature into the scientific process.

Greater emphasis should be placed on nature-based solutions. The focus on climate resilient development in the AR6 cycle is an important innovation, as is the attention to demand-side solutions that link urban mitigation and adaptation actions to wider territorial areas. Important advances have also been made in knowledge and policy around nature-based solutions, including ecosystems-based adaptation. Cities are also increasingly attempting to connect local commitments on bolstering biodiversity and investments in conservation to broader climate change strategies and capital plans to invest in green and sustainable infrastructure. The nascent stage of these efforts means this is an area ripe for further scientific exploration and collaborative innovation.

Access to resources remains a crucial barrier while co-developed risk transfer strategies are lacking. Many cities face challenges finding and retaining expert practitioners, acquiring technical knowledge, accessing funding, and making a scientifically-based case for local investment, particularly for adaptation and resilience. This resource gap is further exacerbated when international, national, and local investment plans, risks, and vulnerabilities are misaligned. Locally determined solutions need to be further

fostered, while strategies for risk transfer and design of investment portfolios need to be co-developed between all levels of government, in partnership with the private sector and local communities.

Collaboration opportunities between government and business are also underexplored and under-facilitated. The SUP Series, based on strong practitioner participation, has identified numerous areas of underdeveloped action and knowledge gaps for targeted research. Few scientific platforms exist that support truly co-created solutions across government with the private sector. In the absence of these, each community of practice will continue to operate on their own, and with less than optimal results:

- Government policymakers, whether at the national or subnational level, are limited in their abilities to quickly enact policy, implement policies unilaterally, or secure the resources necessary to scale effectively.
- Businesses are developing new and innovative solutions, but often without consulting the institutions and actors that will need to implement them, and/or enact or inform the policy that could enable them.
- Investors are looking for appropriate opportunities, but financial decision-making rarely lines up with innovation, particularly in the development finance context.
- Young leaders are looking for opportunities to engage, but rarely have the opportunity to be heard outside of organized campaigns or protests and so are not seen as the collaborators and innovators that they wish to be.
- Frontline organizations are rarely involved until the implementation stage and therefore do not have the opportunity to inform policy, technology, or investment solutions and their associated impact (or lack thereof) on communities with the greatest need or vulnerability.

Each of these communities continues to advance political commitments, thought leadership, and advocacy campaigns and platforms. While collaboration is at times pursued, these pledges, asks, and ideas have rarely found their way into a space where inclusive and collaborative problem-solving is the primary focus. They need to.

Nairobi, Kenya

Mumbai, India

Co-Creating Solutions: SUP Moving Forward

Taken together, the global assessment of climate change science offered by the world's leading scientists and the extensive SUP Initiative process of engagement with cities and businesses make clear the need for further work at the nexus of cities, businesses, and climate science.

This work must:

1. Offer further regional specificity;
2. Integrate adaptation, mitigation, and sustainable development in local solutions; and
3. Bring new, even gray, literature immediately into the policy conversation; and
4. Develop new platforms for collaboration.

As evidenced from the scientific literature and the SUP engagement process, most solutions will require collaborative intervention that involves all levels of government, the scientific community, businesses, and Indigenous and local communities. While there has been analysis of urban potential in global frameworks like the Paris Agreement's Nationally Determined Contributions, structures that incentivize co-creation of solutions from the local to global scale have been lacking – until now.

The SUP Initiative has successfully established a platform for this type of collaborative co-creation – beginning by presenting the most up-to-date climate change science for active use by policymakers and business leaders working in the city and urban space. This initiative has great potential to build upon this strong scientific evidence base to foster thought leadership at regional scale, while advancing specific actions which must be both designed and implemented through co-created and jointly delivered climate change action involving stakeholders from all sectors.

The partners of the SUP Initiative, in consultation with city and business memberships, will advance the following priority solutions and action steps to maximize the value of this unique platform.

Together we will:

- Translate recommendations from the SUP into co-created policy action plans through an ongoing series of regional and sectorally focused convenings. These work plans will advance regional specificity while also outlining specific actions, data, information, and technology needs, as well as funding requirements, of all levels of government and relevant communities of practice to realize transformational change;

- Shape future research by global institutions and establish bridging mechanisms between the scientific and practitioner communities;

- Secure commitments to research and development and/or scaling-up of investments from the business and investor community;

- Advance enabling policy environments across levels of government to foster urban innovation and support the systems transitions necessary;

- Utilize the learnings from this process to inform and advance continued co-creation around the IPCC's upcoming Special Report on Cities in the AR7 cycle;

- Support accelerated delivery of initiatives such as the Cities Race to Zero, the COP27 Presidency's Sustainable Urban Resilience for the Next Generation (SURGe), and the Urban7 and Urban20 platforms connected to the G7 and G20; and

- Continue to partner with the IPCC to further the dissemination of the critical science it will produce in future cycles, making science readily available for local leaders and decision makers.

Conclusion

Our scientific understanding of climate change is advancing, as is our knowledge about the necessary steps needed to address it. As captured in the SUP Series, the IPCC AR6 cycle advanced knowledge on the role that cities and urban areas can play in addressing the climate change crisis. Together, they made clear that significant knowledge, resource, and action gaps remain. The regional and global convenings led by the SUP Initiative confirmed these gaps and identified additional ones.

The Special Report on Cities, the first special report expected from the IPCC Seventh Assessment (AR7) cycle, will ideally seek to address these gaps and continue to build our shared knowledge on the science of cities and climate change.

The SUP Initiative will build a new platform for collaboration, one grounded in science and knowledge co-creation, and focused on advancing enabling conditions, specific actions, and ultimately transformation.

Tokyo, Japan

Regional Highlights

EUROPE

- Multijurisdictional collaboration must be fuelled by a common understanding (of science and data).
- Solutions should integrate mitigation and adaptation as well as align with SDGs while taking a place-based approach.
- Cities should not only be seen as labs, but as true collaborators.
- Supporting multi-level structures and initiatives such as the Global Covenant of Mayors need to be further strengthened.

AFRICA

- There is need for an approach that begins in Africa, rather than exports a North American or European process to Africa. Climate work in Africa often feels very lonely, under-resourced, and misunderstood. Resource gaps exist related to data, scientists as well as science, access to finance, and urban policymaker capacity.
- Public awareness is a critical factor to political viability of advancing climate solutions.

NORTH AMERICA

- Support is needed in interpreting what the latest science means in application.
- Environmental justice and equity is a priority – a particular focus on language justice would be valuable, including more emphasis on global equity and North America's fair share of decarbonization.
- Science needs to be much more accessible to both city practitioners and the general public.

OCEANIA AND EAST ASIA

- Understanding the level of government responsible for each action is important – as well as how business, local communities, and science can work in tandem.
- True co-creation is essential, as are platforms that support and incentivize collaboration.
- The biggest gap is around adaptation – both in terms of understanding the data as well as the solutions.
- Cities are increasingly looking to transfer or share risk associated with climate impacts, but opportunities and legal implications are not fully understood.

SOUTH AND SOUTH EAST ASIA

- Governance is at the heart of potential for successful climate action – there is a need for consistent strategy across political transitions.
- Cities need accessible translations of the latest science – not only to inform (and provide evidence for) their own policy, but also to educate citizens, starting at an early age.

LATIN AMERICA AND THE CARIBBEAN

- Even the global SUP report must somehow reinforce regional differences, including the needed role for the private sector, different levels of government and the appropriate entry point and language.
- The biggest challenge is to reach policymakers and the public with a simple message, which must connect to things of relevance for the region (e.g. poverty, lack of basic services).

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