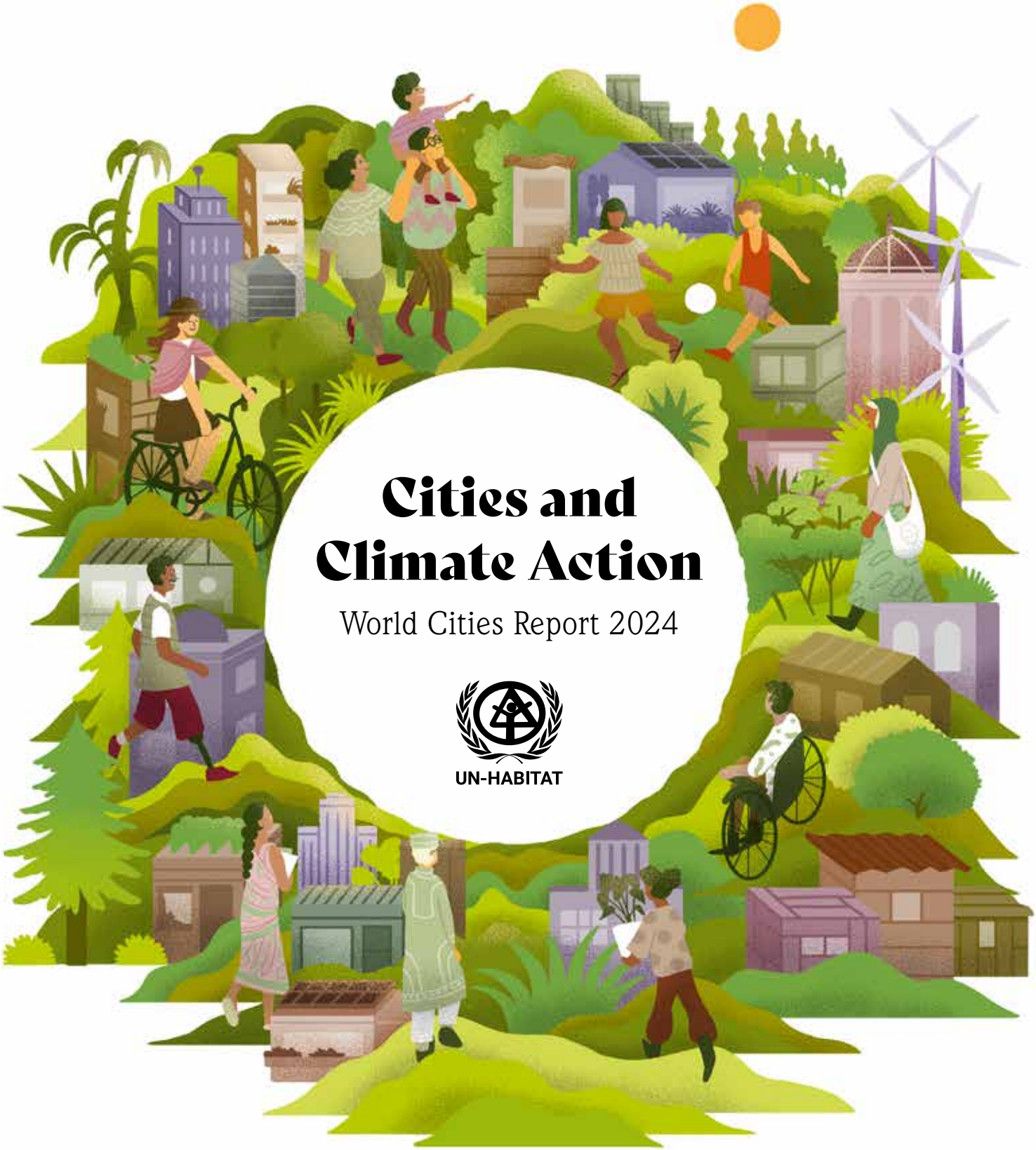

Cities and Climate Action

World Cities Report 2024

UN-HABITAT

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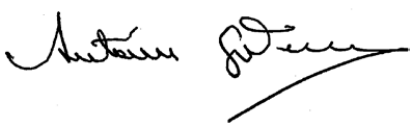
Secretary General's Foreword

António Guterres
Secretary-General of the United Nations



The fight against climate change and the struggle to achieve more sustainable and equitable urbanization are two sides of the same coin.

When buildings, homes and vital infrastructure like water and transportation systems are poorly planned, built and managed, they are no match for climate-fueled disasters like rising seas, heatwaves, and other extreme weather impacts. This challenge disproportionately affects the poorest and most vulnerable people.

But as this report shows, with bold investments and good planning and design, cities offer immense opportunities to slash greenhouse gas emissions, adapt to the effects of climate change, and sustainably support urban populations.

Hundreds of cities around the world are leading the way by expanding inclusive green spaces, reducing emissions through smart planning and building, and investing in renewable energy to power civic services like transportation networks.

This report highlights strategies for local and regional governments and other partners to collectively forge solutions, drive innovation and craft budgets and policies that support sustainable urbanization for people and planet alike.

City and local leaders must also continue to be at the forefront of the fight against climate change. In many cases, cities are going further and faster than national governments in limiting global temperature rise to 1.5 degrees Celsius. The success or failure of new national climate plans will be realized at the community level, and local leaders must be involved every step of the way.

The recently adopted Pact for the Future highlighted the importance of all levels of government working together to plan, design and build safe, healthy, resilient and sustainable cities for all people.

As we accelerate our efforts to reach the Sustainable Development Goals by 2030, let's work to ensure that cities, everywhere, contribute to this goal.

Executive Director's Introduction

Anacláudia Rossbach
Under-Secretary-General and Executive Director
United Nations Human Settlements Programme
(UN-Habitat)

UN-Habitat has been sounding the alarm on the threat facing cities from climate change for decades. The publication of the *Global Report on Human Settlements 2011: Cities and Climate Change* was a landmark, but our work on the complex and fast-moving intersection between the twin challenges of the climate crisis and rapid urbanization long precede this. With every year, however, the message has become more urgent as the impact of climate change worsens while concrete action to address it lags far behind. From rising sea levels to urban heatwaves, the human, economic and environmental costs are becoming too high—and are only set to increase in future. This report shows that almost no urban resident will be unaffected, with billions of people subjected to hotter temperatures or exposed to the risks of flooding and other threats.

Yet, climate change impacts are unevenly distributed within urban areas. Those most at risk from climate change are also those already facing persistent and chronic structural inequalities. Informal settlements and slums—typically situated in environmentally sensitive areas and lacking in protective infrastructure—often bear the brunt of climate-related disasters or extreme events. At the same time, the less visible effects of power imbalances, hierarchies and discrimination are compounding the vulnerability of the most marginalized individuals and communities. Women, children, people with disabilities, older people, migrants, minorities and Indigenous Peoples, among others, are not only more exposed to risk in the first place, but also less likely to receive support once a shock does occur. Accelerated transformation of slums and informal settlements, as well as addressing the needs of the most vulnerable territories in cities is thus a priority.

Of course, while the danger cities face from climate change is considerable, their dominant role in generating emissions must also be addressed. Cities have been routinely blamed, with some justification, for perpetrating the climate crisis due to the carbon-heavy patterns of consumption and production that urban areas can create. This, however, is only part of the picture. As this report shows, cities are already proving that it is possible to urbanize in a way that benefits, not harms, the planet. From electrified transport networks to energy-efficient buildings, ecosystem restoration to recycling, there are a range of paths we can pursue that will help curb the negative effects of urbanization while offering safer, healthier and more liveable cities for those living in them. Local and regional governments are already leading the way through action for climate adaptation and mitigation.

Caution is needed in accelerating climate adaptation and mitigation efforts in cities to avert unintended and exclusionary consequences. When protective disaster infrastructure is constructed in cities, poor households, and those living in informal settlements and slums may find themselves evicted or more exposed if such communities are not factored into the design

It is especially urgent to put in place the right urban policies, legislation and finance to leverage housing and basic services as key instruments through which climate action is enabled. Promoting energy-efficient and durable housing and construction has tremendous potential to advance climate action. Investing in basic services especially energy, water and sanitation and transport with a view to mitigate and adapt to climate is essential. It is equally critical to ensure that urban land is used to maximize its social, economic and ecological functions for more compact growth that improves energy consumption, affordability, economic value and accessibility in cities. These vast opportunities that cities offer to achieve broader global goals for climate change are too often overlooked and untapped. It is time to unlock this potential.

At the same time, caution is needed in accelerating climate adaptation and mitigation efforts in cities to avert unintended and exclusionary consequences. When protective disaster infrastructure is constructed in cities, poor households, and those living in informal settlements and slums may find themselves evicted or more exposed if such communities are not factored into the design. Further, sustainable buildings and construction measures may be expensive and compromise affordability. The phenomenon of "green gentrification" and the exclusionary effects of rising house prices that it can bring in its wake is one such case. This is why the planning and implementation of both adaptation and mitigation measures must be locally-led, with those traditionally sidelined from decision-making given centre stage. While climate action requires urgent global solidarity, it must also involve critical stakeholders at the local level. Developing improved mechanisms for dialogue and identification of solutions with civil society and grassroots organizations is key. Ultimately, a people-centred approach is key, placing social aspects and inclusion at the centre of climate action in cities and beyond.

In this regard, while much of the contents of this edition of the *World Cities Report* is sobering, there is also cause for optimism. It offers a comprehensive overview of what needs to be done at the international, national and local level to achieve the change needed to respond adequately to the climate crisis. While the work required is wide-ranging, from revitalized, multi-stakeholder governance frameworks to a significant increase in both the quantity and quality of finance available to fund city-led climate action, the benefits this will bring could be truly transformative. Indeed, the push to achieve climate resilience cannot be separated from the agenda of sustainable cities and human settlements as envisioned in the New Urban Agenda and Sustainable Development Goal 11.

What is clear is that climate change is already upon us. For those city dwellers caught on the frontline of the various catastrophes playing out in cities—houses destroyed by cyclones, roads melted by extreme heat, entire settlements inundated in flood water—denial or delay is not an option. We already have the solutions to act, should we so wish. As documented in this report, with the right will and resources, cities and communities are already proving their ability to deliver innovative, inclusive and scalable approaches to climate resilience that point the way forward to a thriving urban future. We do not need to wait for a silver bullet to be invented: instead, drawing on the prescriptions in these pages, and together through stronger coalitions, we can and we must have the courage to take action today for the sake of present and future generations.

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Acronyms and Abbreviations

100RC	100 Resilient Cities
ACCCRN	Asian Cities Climate Change Resilience Network
AI	Artificial intelligence
ASP	Adaptive social protection
BGI	Blue-green infrastructure
BRT	Bus rapid transit
C40	Cities Climate Leadership Group
CAP	Climate action plan
CBD	Convention on Biological Diversity
CBD	Convention on Biological Diversity
CCAP	Climate Change Action Plan
CCCI	Cities and Climate Change Initiative
CCFLA	Cities Climate Finance Leadership Alliance
CDP	Carbon Disclosure Project
CEMS	Copernicus Emergency Management Service
CNG	Compressed natural gas
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COLGEI	Coalition of Local Governments for Environmental Initiative
COP	Conference of the Parties
COVID-19	Coronavirus disease
CRDP	Climate-resilient development pathway
CSN	Climate Shelter Network
DFI	Development finance institutions
DRR	Disaster risk reduction
EbA	Ecosystem-based adaptation
EM-DAT	International Disaster Database
EPR	Extended producer responsibility
ESSC	Environmental Science for Social Change
EU	European Union
EV	Electric vehicle
GAP	Gender action plan
GCA	Global Commission on Adaptation
GCF	Green Climate Fund
GCoM	Global Covenant of Mayors for Climate and Energy
GDP	Gross domestic product
GHG	Greenhouse gas
GHSL	Global Human Settlement Layer
GHS-UCDB	Global Human Settlement Urban Centre Database
GIS	Geographic information systems
GLA	Greater London Authority
GNDR	Global Network of Civil Society Organizations for Disaster Reduction
GSSS	Green, social, sustainability and sustainability
GST	Global stocktake
Gt	Gigaton
GTF	Global Task Force
HLPF	High-level Political Forum on Sustainable Development
HPFPI	Homeless People's Federation of the Philippines
HVAC	Heating, ventilation, and air conditioning
ICLEI	Local Governments for Sustainability
ICT	Information and communications technology
IEA	International Energy Agency
iNDC	Intended nationally determined contributions
IOM	International Organization for Migration
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC	Intergovernmental Panel on Climate Change
ISWM	Integrated solid waste management
ITS	Intelligent transportation systems
IWRM	Integrated water resource management
JMC	Jinja Municipal Council
KCCA	Kampala Capital City Authority
L&D	Loss & Damage
LECZ	Low elevated coastal zones
LEED	Leadership in Energy Efficiency and Design
LGMA	Local Governments and Municipal Authorities Constituency
LiDAR	Light detection and ranging
LUCHACOS	Lubaga Charcoal Briquettes Cooperative Society Limited
MDB	Multilateral development bank
MDF	Municipal development forum
MPGCA	Marrakech Partnership for Global Climate Action
MRTS	Mass rapid transit system
NAP	National Adaptation Plan
NbS	Nature-based solutions
NCQG	New Collective Quantified Goal
NDCs	Nationally determined contributions
NGO	Non-governmental organization
NMT	Non-motorized transport
NRG4SD	Global Network of Regional Governments for Sustainable Development
NUA	New Urban Agenda
NUP	National urban policy
ODA	Official development assistance
OECD	Organisation for Economic Cooperation and Development
PPF	Project preparation facility
PPP	Public-private partnerships
R&D	Research and development
RCPs	Representative concentration pathways
RISE UP	Resilient Settlements for the Urban Poor
SAFSC	South African Food Sovereignty Campaign
SDG	Sustainable Development Goals
SDI	Shack/Slum Dwellers International
SDSN	Sustainable Development Solutions Network
SEWA	Self Employed Women's Association
SIDS	Small Island Developing States
Sq. km	Square kilometre
SSP	Shared socioeconomic pathway
SURGe	Sustainable Urban Resilience for the Next Generation
TAMPEI	Technical Assistance Movement for People and Environment, Inc.
TFURP	Temasek Foundation Urban Resilience Program
TNCs	Transnational city networks
TSUPU	Transforming the Settlements of the Urban Poor in Uganda
UCLG	United Cities and Local Governments
UHI	Urban heat island
UK	United Kingdom
UNDP	United Nations Development Programme
UNDRR	United Nations Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
US	United States of America
US$	United States Dollar
VLRs	Voluntary Local Reviews
VNRs	Voluntary National Reviews
WEF	World Economic Forum
WHO	World Health Organization

Key Findings and Messages

Chapter 1

Cities as Hubs for Climate Action

Cities are both victims of climate change and among its worst perpetrators: not only are they disproportionately exposed to its impacts, but they are also responsible for generating a large share of global emissions. This means there is not only a moral imperative to take urgent action at the local level to promote low-carbon, sustainable urbanization, but also a compelling logic. Cities, in fact, are highly conducive to the implementation of adaptation and mitigation programmes that deliver a range of co-benefits to communities in terms of poverty reduction, employment, service provision and quality of life. Already, some of the most exciting and progressive solutions are emerging from cities and communities who in many cases are taking action, in the absence of national and international support, to strengthen their collective resilience. In addition, cities across the world are demonstrating that it is possible to decouple urban development from increasing emissions. Increasingly, then, urban areas are being seen not just as part of the problem, but part of the solution too—even if their full potential has yet to be realized.

Key Findings

Though urbanization continues to be a major source of greenhouse gas emissions, in many contexts urban emissions per capita are now lower than national averages. The last 30 years have witnessed a gradual weakening of the link between cities and emissions globally. While in lower-income and developing countries urban per capita emissions are often still higher than those in rural areas, the opposite characterizes developed countries, where urbanization, greenhouse gas emissions and welfare are increasingly delinked. These changes are not solely accounted for by levels of urbanization, but also determined by consumption and production patterns, lifestyle choices, behavioural change and policy decisions around energy, housing, transportation and other key sectors.

Rather than regarding them as problems, cities should be seen as key to achieving global climate goals. Indeed, compact cities with well integrated transportation systems and energy-efficient buildings can be significantly more sustainable than suburban or rural areas. Vilifying cities as producers of greenhouse gas emissions is to fundamentally misunderstand their potential to deliver a more sustainable future for our planet. Contrary to the perception of cities as polluting, countries are not condemned to face rising emissions while urbanizing: net zero or low-carbon pathways can be achieved through appropriate climate-responsive planning choices.

Even countries with low levels of urbanization can plan and commit to ambitious climate action targets in their cities. Analysis of the implied conditional 2030 targets within different National Determined Contributions, found no relationship between each country's level of urbanization and their level of climate commitments. This implies that the level of urbanization is not a determining factor, positive or negative, in a country's ambition in setting climate goals. On the one hand, some countries at a relatively early stage of urbanization have shown themselves willing to commit to significant climate action. On the other hand, many cities and local governments have set ambitious climate goals that far exceed the pledges of their respective national governments.

Countries that have a higher share of informal housing and employment are more vulnerable to climate change. People living in informal settlements and engaged in informal employment face a double climate injustice: though contributing only limited emissions, they are typically the most vulnerable to the immediate consequences of climate change due to their disproportionate exposure to environmental hazards and loss of livelihoods. While informality is often overlooked in urban planning processes, including climate action, supporting residents and workers in this sector represents one of the best investments a city can make to strengthen its overall resilience.

Key Messages

Climate action, as currently implemented in urban areas, does not reflect the urgency of the threat posed by climate change. The severity of climate change impacts for urban communities, infrastructure and ecosystems should be driving climate action, but this is not the case in many contexts. Bold investment decisions, stringent emission reduction and ambitious adaptation plans will be required to prevent catastrophic loss and damage, especially for the most vulnerable groups who are the most exposed to extreme weather events and the least able to recover from their effects.

People must be at the centre of any meaningful climate action in cities and human settlements. Climate action must be inclusive and respond to the needs of the most vulnerable, especially children, women, older persons, people living with disabilities, Indigenous Peoples, slum dwellers, refugees and displaced populations. These groups are disproportionally affected by the effects of climate change events due to their limited access to coping mechanisms and the absence of social protection. From inclusive planning to targeted welfare support, cities should develop a comprehensive and participatory approach to resilience building.

Cities are at the forefront of addressing the challenge of climate change, both in terms of direct mitigation and adaptation efforts and resilience building. Cities, by concentrating people, businesses and institutions, represent not only places of enhanced and clustered vulnerability to climate change, but also places of unique opportunity.

Cities are where climate action can be effectively leveraged, thanks to a wide range of co-benefits, along with a variety of specifically urban low-carbon solutions (such as integrated public transit) that are possible due to their compact land use and economies of scale. Furthermore, as centres of buoyant innovation and advocacy, cities are ideally suited to the creative problem-solving that climate change demands.

Aligning climate change adaptation with poverty reduction and disaster risk reduction through community-led settlement upgrading can help build resilience to climate shocks. Many informal practices already embody principles that are aligned with low-carbon pathways and which inclusive climate action should actively foster. Social inclusion and human rights principles should be mainstreamed into their climate adaptation and mitigation frameworks, as a tool to ensure equitable outcomes and prevent forced eviction in the name of climate action. Adaptation in a context of urban informality needs to achieve tangible and rapid impacts in improving people's livelihoods, in ways that incrementally accumulate to larger-scale, longer-term transformation.

Chapter 2:

Climate Change and International Development: What Have We Achieved Since the Adoption of the Paris Agreement?

There has been increasing attention focused on the challenge of climate change in recent years, reflected in the passage of the landmark Paris Agreement in 2015 and an array of other development frameworks such as the 2030 Agenda for Sustainable Development and the New Urban Agenda that include specific components addressing its threats. However, the reality on the ground is that the world remains firmly on course to break the agreed ceiling of a 1.5 degree Celsius increase from pre-industrial levels. In part, this failure is the result of continued barriers to action at the local level: cities are still largely excluded from national and international decision-making around resilience building, and lack access to adequate levels of finance to take meaningful action themselves. However, there is evidence that this is beginning to change as awareness grows of the pivotal role cities can play in mounting a unified response to the climate crisis. Recent years have also seen debates on climate justice shift from the global to the local level, with cities beginning to mainstream climate equity considerations into their programmes. Consequently, the various global agendas set in place in recent years offer an important framework to guide and coordinate climate action across a multitude of scales and in different urban contexts.

Key Findings

Climate change has emerged as a critical factor shaping international development policy, with widespread implications. Despite notable progress, the world is not on track to remain within the 1.5 degree Celsius ceiling for global warming set by the Paris Agreement. Much more action is urgently required, with many challenges to overcome to achieve transformative climate commitments across cities. Encouragingly, however, climate change is increasingly being mainstreamed as a critical dimension across a range of different development and human rights agendas. At the same time, social justice and inclusion agendas are having an increasing influence on climate discourse and action on the ground, with youth and Indigenous Peoples playing key advocacy roles.

Historically, global climate negotiations and outcomes have not adequately addressed cities and other subnational entities, but this has begun to shift, with considerable implications for policy development. Since the Paris Agreement, advocacy by city networks has supported the development of stronger multi-level governance, as well as the increasing prominence of cities and subnational governments in COP negotiations and other international fora addressing climate change. However, cities and subnational authorities are still marginalized in formal negotiation processes. More supportive enabling environments and enhanced support are urgently required, particularly in small- and medium-sized cities and informal settlements to ensure achievement of the Paris Agreement.

Though there have been several significant societal and technological developments since the Paris Agreement, the impacts have been unevenly distributed. From increased electrification to artificial intelligence, these forces have intensified over the past decade, with widespread implications for international development policy and climate action. However, at both the global and local levels, many are still excluded from these benefits. Integrated approaches that bridge the various divides at play—between urban and rural areas, formal and informal neighbourhoods, developed and developing countries and regions—are critical to ensure that climate action and sustainable development are delivered equitably.

The private sector is a critical source of expertise, innovation and resources for supporting urban climate action. Though private sector interventions remain largely mitigation-orientated, the engagement of companies and investors in green sectors such as low-carbon technologies and electrified transport demonstrates their catalyzing potential. More attention needs to be paid to the continued shortfalls in adaptation funding, however, as well as the potential conflicts of interest and maladaptation risks that private sector-led climate action could bring without appropriate oversight in place.

Key Messages

The journey towards low-carbon futures is a shared responsibility, requiring collaborative policy and interventions across all scales. Countries are showing progress in their recent pledges as evidenced by enhanced, higher-quality climate commitments. Nonetheless, the aggregate effect on global emissions remains highly inadequate and requires urgent action across all quarters, particularly at the city level. Much more needs to be known about the contribution and role of urban governments in shaping and supporting the formulation and implementation of national climate commitments and linked climate policy developments.

Far-reaching, large-scale action is urgently required in a climate-changed world: an essential pathway to achieve this is through the development of inclusive, locally-led urban transformation. To achieve the level of change necessary to keep global warming within relatively safe planetary boundaries, national and local governments need to move beyond piecemeal and incremental reforms. Climate change considerations should be mainstreamed across the breadth of relevant urban development sectors, from housing and transportation to water, sanitation and waste management, to ensure that different global development priorities are aligned with the overarching aim of building socially inclusive climate resilience.

Unifying global frameworks is key to achieving global climate and development goals. Global governments across scales are guided by a unifying framework for achieving urban climate resilience laid out in the Sustainable Development Goals, the New Urban Agenda, the Sendai Framework for Disaster Risk Reduction, the Addis Ababa Action Agenda and the Paris Agreement on Climate Change. In combination these frameworks recognize the centrality of multi-level action and emphasize the role of subnational entities, particularly local governments, in building climate resilience. This requires acting consistently and collaboratively across administrative and political boundaries at all scales, not least in relation to climate action.

Closing the climate finance gap is a pressing priority. Mobilization of additional finance and restructuring of financial architecture is urgently required at all scales to ensure that climate adaptation, mitigation and loss and damage receive new and additional funding. It is also important that local governments and communities have direct and equitable access to allocated funds. Justice-based approaches are central to merging and mainstreaming urban climate finance mechanisms to avoid the creation or reproduction of existing inequalities.

Addressing equity considerations in climate action remains an urgent global priority. People-centred, equity-based urban design and planning are central to achieving the transformative commitments of the Paris Agreement and other global agendas, including the Loss and Damage mechanism. While there has been considerable progress through community-led collaborations to reduce disparities within cities, critical barriers remain. To remove these obstacles, issues of cultural diversity, gender, age and other dimensions of intersectionality must be effectively integrated into the design of national and local policies. Upscaling and mainstreaming is urgently required, with a focus on locally-led, people-centred and collaborative climate interventions.

Chapter 3:

Exposure to Climate-related Hazards: Current and Future Trends

This chapter provides a detailed overview of the current and projected exposure facing cities from a variety of climate change impacts: from temperature increase to sea-level rise and riverine flooding. It demonstrates how, even in moderate scenarios, billions of city dwellers could be directly affected as the crisis deepens and widens in the near future. Through adopting a geospatial approach that uses the *Degree of Urbanisation* methodology for defining different urban and rural areas, this chapter shows that virtually no urban inhabitant is unexposed to climate change, even though the impacts will be differentially felt. Importantly, modelling shows that the extent of these challenges will be greatly dependent on the pathways we choose today: the true human and environmental cost will depend to a large extent on whether or not dedicated and proportionate action is taken now. An important first step in making this happen is to develop detailed, multi-dimensional assessments in cities and communities, particularly developing countries and informal settlements where investment in data collection and analysis has often been limited. In this way, cities can develop a clearer picture of current patterns of vulnerability in their territories and tailor their responses accordingly to ensure the most exposed areas are prioritized for protection.

Key Findings

The increasing concentration of people in hazard-prone urban areas means the impact of climate change is increasingly urbanized. The exposure of cities to climate hazards, including heatwaves, sea-level rise and riverine flooding, has grown disproportionally faster than exposure of people living in rural areas. Cities are indeed at the forefront of the impact of climate change, a situation that is likely to intensify in the coming decades as urbanization continues, particularly in a high-emission climate scenario.

Cities are projected to become hotter in future, with almost no inhabitant unaffected in a carbon-intensive scenario. Assuming the world continues to follow a high-emission pathway, more than 2 billion people currently living in cities could be exposed to an additional temperature increase of at least 0.5 degrees Celsius by 2040. In addition, temperature changes of 0.5 degrees Celsius and above would affect over half of cities and their populations worldwide. In this scenario, as much

as 36 per cent of the global population in cities could experience mean annual temperatures of 29 degrees Celsius or above. Just 1 per cent of the population in cities globally would be spared temperature increases.

A significant proportion of cities will transition to more arid or humid conditions—the magnitude will depend on different policy choices and emission scenarios. The proportion of cities expected to change climate type between 2025 and 2040 varies from a minimum of 14 per cent in a low-emission context to 26 per cent in the worst-case projection. At least 600 cities across the world could be transitioning to drier climates by 2040, exposing more than 180 million additional people to various impacts, in particular water scarcity. At least 900 cities could be transitioning to more humid climates by 2040, affecting an additional 250 million people compared to current exposure: of these, most are projected to transition to a tropical climate, where increased humidity makes it more challenging to manage extreme temperatures.

Sea-level rise poses a profound threat to many coastal cities worldwide, creating even greater exposure in areas already vulnerable to flooding. By 2040, more than 2,000 cities will be located in low elevated coastal zones of less than 5 metres above sea level, rising to 2,620 cities for less than 10 metres above sea level. These cities will face heightened risks from sea-level rise and storm surges. The current population in these exposed cities is already 1.4 billion and expected to increase further by 2040. Multi-hazard early warning systems are essential to protect cities in low elevated coastal zones, but many are still not covered.

Riverine flooding, while less publicized as an issue than sea-level rise, nevertheless represents a major hazard in many cities. Currently, areas prone to riverine flood events with 100-year return periods host about 1 billion people: of these, half are based in cities, 39 per cent in towns or semi-dense areas, and the remaining 11 per cent in rural areas. By 2030, at least 517 million people living in cities will be exposed to riverine flooding with a 100-year return period, which is 14 per cent of the global population living in cities. Since 1975, exposure to flooding in cities has grown 3.5 times more than exposure to flooding in rural areas.

Key Messages

Though the projected impacts of climate change on cities appear bleak, better policy choices and effective climate action now have the potential to significantly limit future exposure. Alongside a more sustained global commitment to mitigation to remain within a moderate emission scenario, various measures can lead to substantially lower levels of urban climate exposure in the future. In particular, an integrated and adaptive approach to planning that is guided by current and projected environmental risks could result in significantly more resilient outcomes for cities.

The urbanization of climate exposure means that strategies to reduce vulnerability must be conceived through an urban lens, placing cities at the centre of climate action. Cities should adopt comprehensive, proactive approaches that address the collective needs of their populations, rather than isolated actions that may unintentionally increase risk elsewhere. By focusing on urban-specific adaptation and mitigation, cities can enhance their resilience to climate change and safeguard the lives and livelihoods of their inhabitants. Early warning systems for urban areas are particularly critical, as they provide timely alerts that can save lives and reduce economic losses. By integrating these systems into a broader resilience framework, cities can ensure that they are better equipped to handle the challenges posed by a changing climate.

Closing the urban exposure and vulnerability data gap is critical for cities to effectively prepare for and respond to climate risks. A comprehensive understanding of disaster risk is key to these aspirations, and it can only be built by integrating data and knowledge across scales and thematic areas. International frameworks such as the New Urban Agenda, Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction rely on data that are globally consistent and locally relevant. An assessable, readily comparable evidence base is essential to build cities that are not only sustainable, but also equipped to withstand and adapt to climate-related challenges.

There is a need to move beyond measuring exposure to determining vulnerability through detailed, localized assessments. Understanding vulnerability is critical for implementing effective action. By focusing on vulnerability, policymakers can prioritize interventions that address the root causes of risk and target resources to where they are most needed. This requires a granular analysis of the social, economic and physical factors that influence a community's ability to anticipate, cope with, respond to and recover from the impacts of extreme weather events. Localized exposure and vulnerability assessments are essential to capture the specific conditions and needs of urban populations and infrastructure.

Chapter 4:

Climate Action and Vulnerable Urban Groups

Though almost all urban residents will be affected to some degree by climate change, its impacts are not distributed evenly. The climate crisis is already interacting with existing patterns of inequality and exclusion, meaning the most marginalized populations—including women, children, migrants, people with disabilities, ethnic minorities and Indigenous Peoples—are disproportionately affected. Currently, urban climate interventions are failing to adequately recognize the specific challenges these groups face. Consequently, millions of urban residents (especially those living in informal settlements) are being excluded from adaptation plans and even negatively impacted by climate interventions that overlook their needs. Cities must therefore ensure they address the social dimensions of vulnerability by promoting community-led interventions, targeted in particular at the most neglected neighbourhoods and incorporating a variety of pro-poor elements such as inclusive service provision and welfare support.

Key Findings

The impacts of the climate crisis are being unleashed in an unprecedented manner on many inter-connected urban systems, including economic, social, ecological and urban infrastructure systems. Globally, cities are bearing the catastrophic impacts of the climate crisis due to persistent flooding, scorching heatwaves, looming water stress and storm surges, among other risks. Coastal flooding will trigger a huge economic cost for cities in both developed and developing regions. Assuming moderate levels of sea-rise, without additional investment in adaptation and risk management, 136 of the largest coastal cities could incur annual losses exceeding $1 trillion by 2050. Climate-induced extreme heat is far deadlier than other natural disasters, killing on average more than twice as many people each year as hurricanes and tornadoes combined. In the summer of 2024, temperatures in some parts of the world soared to almost 50 degrees Celsius in one of the longest heatwave spells recorded.

Urban informality by its nature is a key driver of vulnerability, with slums and informal settlements among the most exposed to disasters and other impacts. Besides often being situated in low-lying, flood-prone or precarious locations, official hostility and social stigma towards informal settlements frequently means they are denied basic services and excluded from protective infrastructure. Furthermore, their lack of legal recognition or secure land tenure means that residents are unable to invest in upgrading improvements due to the fear of eviction. Informal livelihoods are also highly exposed to climate change: the absence of social welfare and already precarious conditions mean that informal workers are more likely to be disrupted by extreme weather and other shocks.

The climate crisis is profoundly discriminatory, intersecting with and reinforcing pre-existing vulnerabilities among certain groups. Climate change is disproportionately affecting already marginalized urban groups, including women, children, residents of informal settlements and minority communities, among others. The situation is particularly dire for people living with disabilities, who are often invisible in climate change policies and programmes: as a result, they are up to four times more likely to die in the event of a climate-related disaster compared to other groups. Migrant and displaced populations in urban areas, including many whose decision to move to the city was driven in part by environmental stress or instability, are especially at risk of being uprooted again due to the impacts of climate change.

In many cases, current urban adaptation and mitigation efforts are failing to protect the most vulnerable populations from climate change—and even making their situation worse. When national and local governments overlook broader injustices, including gender-based inequalities and racial discrimination, there is a danger that climate actions will fail to address underlying drivers of vulnerability and overlook the specific needs of certain groups. For example, nature-based investments such as the development of parks can potentially displace low-income groups or trigger "green gentrification" if efforts are not made to ensure inclusive and accessible outcomes from these interventions. The development of climate-resilient infrastructure can exacerbate exposure in other areas if they prioritize affluent neighbourhoods at the expense of communities elsewhere.

Existing patterns of urbanization create differential vulnerabilities to climate change. The way cities grow, develop, expand and are planned creates unequal conditions for resilience, leaving some areas more vulnerable to climate risks than others. These disparities arise from differences in the quality of infrastructure, access to services, housing conditions and socioeconomic status, which are shaped by urbanization processes. Many cities across the world are marked by long-standing patterns of segregation where marginalized groups are concentrated in neighbourhoods suffering from decades of underinvestment. In some contexts, the rapid expansion of unplanned settlements is also associated with higher exposure to climate risks, particularly when communities are forced to settle in environmentally vulnerable or underserviced areas.

Key Messages

Adaptation plans that are co-created with diverse urban groups are more likely to result in inclusive, effective solutions that build the resilience of the most vulnerable to climate shocks. A transformative people-centred approach to climate action depends on the ability of governments and other stakeholders to create opportunities and platforms for diverse voices, especially those at the frontline of the climate crisis. Vulnerable populations should therefore be treated as partners in the planning and implementation of urban climate action plans. This is critical because grassroots knowledge systems, if complemented with scientific information and innovations, can inform and enhance adaptation planning.

Municipal governments should support locally-led climate adaptation to address vulnerability, boost resilience and enhance city-wide climate action. Supporting bottom-up climate adaptation efforts is essential for effectively tackling vulnerabilities and building resilience within cities. When municipalities back grassroots initiatives and community-driven projects, they empower residents to take charge of their own climate solutions, leading to more targeted and effective adaptation that reflects the unique needs and strengths of their communities. Locally-led adaptation projects often leverage local knowledge and resources, making them more sustainable. This approach not only helps communities better prepare for and respond to climate-related challenges, but also fosters greater community engagement in climate initiatives.

Cities should prioritize investing in resilient infrastructure in underserved communities as a basis for building their resilience to climate-induced shocks. As the impacts of climate change intensify, vulnerable and underserved neighbourhoods often bear the brunt of environmental disasters and infrastructure failures. By directing resources towards the development of resilient infrastructure in these areas, cities will not only enhance the well-being of their residents but fortify their long-term ability to withstand and recover from climate-related challenges. This involves upgrading critical infrastructure, sustainable transportation networks, energy-efficient housing and green spaces to mitigate urban heat islands. Focusing on marginalized communities ensures that the benefits of resilience extend equitably

to all residents, addressing social disparities while fostering a more inclusive urban future.

Strengthening social protection programmes that address climate shocks is critical for building the resilience of vulnerable urban groups. Integrating social protection into climate action has the potential to avert, minimize and address loss and damage as well as contributing towards greater resilience. Governments can link social protection with public works programmes that focus on climate adaptation, such as constructing flood defences, improving water management systems or planting trees to reduce the urban heat island effect. This not only provides income for poor urban households, but also enhances community resilience to climate risks. Migrant and displaced populations—including both those driven to the city due to environmental stress, and those uprooted again by climate impacts such as flooding—should also be provided with comprehensive emergency and welfare assistance to support their integration and recovery.

Chapter 5:

Mapping the Solution Space for Climate Action: The Role of Urban Planning and Design

Urban planning and design offer an arsenal of highly effective strategies to improve resilience, yet so far, much of their potential remains untapped. This is despite the many opportunities now available—from the Nationally Determined Contributions and National Urban Policies that have emerged from recent global development agendas, to building codes, zoning and other instruments that can be leveraged at the local level—to promote sustainable, low-carbon development. From renewable energy systems and resource-efficient construction to integrated transport and nature-based solutions, cities have a variety of tools at their disposal to improve resilience and reduce emissions. However, various technical, financial and institutional barriers currently prevent many of these solutions from being enacted. With the right political will at both the national and local level, including adequate funding and expertise to support the development of solutions, cities can work with communities, businesses and other stakeholders to promote compact, integrated and equitable urban fabrics that benefit residents while strengthening resilience.

Key Findings

The last 30 years have witnessed a decline in green spaces in urban areas around the world, a trend that needs to be reversed given its implications for climate. On average, the share of green spaces in urban areas globally decreased from 19.5 per cent in 1990 to 13.9 per cent in 2020. Besides its effects on the environment—through climate change and biodiversity loss—the decline of green spaces has implications for human health and social impacts. This trend was by no means universal: though most cities have seen a reduction due to urban expansion or poor planning, some have managed to increase their share of green space through targeted policies such as mangrove restoration and revegetation.

Climate action plans remain absent in many countries and, where they do exist, typically prioritize mitigation over adaptation. There has been limited investment in adaptation, even in contexts where climate-induced impacts hit hardest While leading the charge in urbanization, national urban policies and climate action plans remain either underdeveloped or completely absent in cities in developing countries, leaving the most marginalized populations—including minorities, Indigenous Peoples, the urban poor and residents of informal settlements—disproportionately exposed to climatic hazards.

Inadequate capacity within local governments and institutional barriers pose obstacles for the development and effective implementation of climate-resilient plans. While planning offers an array of tools that local governments can leverage, at present these opportunities are not adequately exploited. Insufficient knowledge, skills and expertise within local planning agencies hinder the formulation and execution of effective climate action plans. Furthermore, institutional barriers undermine the ability of cities to implement timely climate actions. Rigid planning approaches also struggle to keep pace with rapidly changing climate scenarios, leading to loss and damage that could have been mitigated with more proactive measures.

Climate-resilient planning aligns with the broader principles of inclusive, sustainable urban development. While effective climate action requires a strong level of coordination and sectoral integration, this is also a requirement for sound city planning in general. Some of the most progressive urban paradigms—such as transit-oriented development or the "15-minute city", with its compact, accessible, mixed-use design—are implicitly resilience-building. Similarly, well designed climate interventions will have positive outcomes for public health, well-being and access to green space. Consequently, in many cases climate-resilience planning can be implemented without requiring painful trade-offs when it overlaps with other local development priorities.

Key Messages

Integrating climate action into urban planning and design frameworks is essential for a sustainable future. Urban planning and design play a vital role in efforts to reduce emissions and adapt to climate change. Today, as cities are confronted with increasingly severe impacts, climate considerations should be embedded within urban policies and plans. Where they exist, climate action plans are instrumental in mainstreaming resilience efforts at the local level. It is also imperative for cities to adopt more nimble, well-coordinated, flexible and responsive urban planning mechanisms that facilitate swift adjustments to emerging climate risks. Cities should also engage urban communities directly to ensure their active participation in the design of climate responsive urban forms.

National urban policies should urgently address mitigation and adaptation. These policies should be aligned with the emission reduction targets in Nationally Determined Contributions and must in turn inform climate action plans. Climate action plans should leverage international agreements and urban policy frameworks to integrate sectoral policies (including housing, land use, transportation and energy)

and mainstream climate action. Importantly, climate action plans need to address differentiated vulnerabilities among the urban population and the varying adaptive capacity between communities. With this in mind, planning interventions should incorporate social policies that address underlying risk drivers of vulnerability.

Urban planning and design should promote localized, context-specific climate solutions. Though there is value in replicating a successful project in other settings, the very different socioeconomic and environmental conditions in different cities mean that any initiative should be tailored around these. In this regard, while large-scale mega-projects often attract the most publicity, in many urban areas the most appropriate interventions are likely to be small-scale and community-led. In particular, climate planning should, wherever possible, draw on traditional and Indigenous approaches to construction—for example, the use of vernacular architecture and locally available materials.

Cities should invest in equitably distributed, nature-based solutions. These provide low-cost mitigation and adaptation solutions along with a slew of co-benefits, from carbon sequestration, improved air quality and protection from coastal erosion to lower temperatures, increased biodiversity and rainwater harvesting. Nature-based solutions also provide communities with much needed recreational spaces and promote active lifestyles, improved mental health and the restoration of essential ecosystems. They should be integrated into the design of both buildings (for example, through green roofs and living walls) and urban spaces (as networks of blue-green infrastructure). It is also important that nature-based solutions are distributed equitably throughout the urban landscape to ensure an inclusive and just distribution of their benefits: otherwise, cities may have a large share of green space but still have a significant proportion of the population unable to access it themselves.

Chapter 6:

Resilient Infrastructure as an Accelerator of Transformative Climate Action in Cities

Urban infrastructure is not only a fundamental element in prosperity and well-being in cities, but also a key determinant of risk and vulnerability. Urban areas and communities with inadequate infrastructure are likely to be the most affected by extreme weather events associated with climate change. Without sustained, socially inclusive investments in infrastructure, these infrastructural deficits will widen, in the process exposing many more urban residents to potentially catastrophic climate-induced hazards. The fact that much of the infrastructure needed has yet to be built is both a problem and an opportunity: while the scale of action required is daunting, there is also the possibility for cities to correct course and channel resources towards infrastructure that builds resilience. But even more than that, infrastructure can play a transformative role in reshaping the relationships between urban residents and their surroundings in ways that contribute to lasting and climate-resilient development. By embracing innovative and justice-based approaches to infrastructure, including the promotion of green and blue infrastructure alongside conventional "grey" or engineered infrastructure, cities will not only improve the resilience of their infrastructure but also use it as a tool for societal and environmental transformation.

Key Findings

Resilient infrastructure is a critical element of urban climate action to achieve the Sustainable Development Goals, the Paris Agreement, the Sendai Framework and the New Urban Agenda. Infrastructure is responsible for 79 per cent of total greenhouse gas emissions, making it central to any effective urban sustainability response. Infrastructure also influences the attainment of the Sustainable Development Goals, including 72 per cent of the targets. The New Urban Agenda identifies quality infrastructure as essential for strengthening the resilience of cities and communities. The global infrastructure deficit affects millions of people in rapidly expanding cities, particularly in low- and middle-income countries, and is a key factor undermining development and human rights. In many informal settlements, residents lack access to basic infrastructure such as energy, water and sanitation, waste management and transportation.

Infrastructure around the world is already being affected by climate change, and the costs associated with damaged assets, expensive repairs, service disruptions and loss of life are expected to increase. The development of further infrastructure, while much needed, could leave cities even more exposed to costly climate change impacts if resilience is not a key priority in its design and construction. Investing in the construction, operation and maintenance of resilient infrastructure can generate long-term financial benefits for cities and national economies. While additional up-front funding will be required to achieve this, the returns on this investment are expected to be beneficial. Investment in low-carbon infrastructure can generate significant savings due to a range of efficiencies.

A large share of the urban infrastructure needed to achieve resilience has yet to be built, posing significant challenges but also offering the possibility to build it more sustainably and inclusively. While most infrastructure is currently located in the developed world, 90 per cent of all population growth is taking place in the cities of the developing world: this trend will intensify in the coming decades and will be accompanied by rapid expansion of infrastructure. This represents a significant opportunity to ensure that future infrastructure is built with resilience in mind. While buildings are becoming more energy-efficient, these efficiencies are dwarfed by the sheer extent of construction: infrastructure in other sectors (such as transportation) needs to be planned in ways that lead to significant decarbonization.

Infrastructure should be designed not only to be resistant to the effects of climate change, but also address the underlying social and environmental factors that contribute to vulnerability. Achieving more resilient cities requires infrastructure that is planned, designed, constructed and managed in ways that deliberately build the resilience of citizens and communities, better enabling them to respond to the impacts of climate change. In this way, infrastructure should

aim to be truly transformative—addressing the drivers of both climate change and vulnerability, thereby contributing to broader and positive societal change in the longterm.

Key Messages

Residents should be involved in the planning, design and delivery of low-carbon and resilient infrastructure. Inclusive approaches to land use planning are an essential prerequisite for the development of transformative infrastructure. Encouraging community-led service provision models and other forms of participation in the development of low-carbon service models empowers communities to shape their own urban environments and adapt to the challenges of climate change. By meaningfully involving all relevant stakeholder groups in decision-making processes, cities can leverage local knowledge and expertise to develop innovative solutions that address the specific needs of diverse populations. Local governments should be comfortable to accommodate dissent and contestation within these discussions: these processes offer an important means to identify potential misalignment between planned infrastructure and local needs.

To ensure infrastructure is climate-resistant, but also builds resilience, it is vital to establish systems to fully access the wide range of benefits it will bring. This will require ongoing monitoring and evaluation of infrastructure performance over time. In terms of balancing the short- and long-term environmental implications, it is necessary to assess the immediate emissions created by its construction against the reductions achieved over its lifespan. It is also important to ensure that any cost-benefit analysis factors in the wide range of indirect societal benefits that it will likely bring: while the financial costs are relatively straightforward to enumerate, the benefits in areas such as health or well-being are harder to compute and can easily be overlooked.

Incorporating informality into infrastructure planning and implementation can contribute to equity and resilience in cities. By recognizing and incorporating the diverse economic activities of informal workers into the broader urban fabric, cities can harness their potential to contribute to sustainability goals while enhancing their own resilience. Traditional and informal forms of housing are often low-carbon and adaptive to prevailing climatic conditions in ways that are climate-resistant. Adopting supportive building codes and standards can help guide people and construction companies towards more sustainable options.

Improving and leveraging the network of nature-based infrastructure in cities can serve as a transformative accelerator of climate action. These assets can help cities to improve air and water quality, mitigate the urban heat island effect, enhance biodiversity and reduce vulnerability to flooding. In doing so, nature-based solutions contribute both to climate adaptation and mitigation and thus have an outsized role in achieving global sustainability goals. Ensuring that urban dwellers have access to these facilities and the services they offer—for example, by involving local communities in the planning and delivery of nature-based solutions—can benefit residents by providing ecological and recreational amenities.

Chapter 7:

Multi-level Governance for Inclusive Climate Action

Cities play a unique role on the frontline of climate change, positioning them to design and deliver locally appropriate solutions in partnership with those most affected by its impacts. In practice, however, their ability to act decisively continues to be undermined by their marginal position both in their countries and on the international stage. Even in supposedly decentralized contexts, local governments frequently lack sufficient authority or resources to lead substantively on climate action. Furthermore, national governments remain the primary arbiter of partnerships and agreements with development agencies and financial institutions, affording limited space for local governments to engage autonomously with global development platforms. The need for stronger and more collaborative multi-level governance applies not only to the vertical architecture linking cities with national and international structures, however, but also the horizontal connections between government actors and other stakeholders including communities and civil society organizations. Ultimately, climate action can achieve far more impact if delivered through an inclusive, integrated approach to governance.

Key Findings

The climate emergency is complex and cannot be effectively tackled by local governments, or any single level of government, alone. Addressing the climate crisis calls for a "whole of society" approach, requiring the participation and collaboration of multiple layers of authority as well as cooperation across different jurisdictions, actors and sectors. This requires stronger linkages both vertically between different levels of government (global, national, regional and local) and horizontally (across different departments and sectors, but also between public actors and external stakeholders including civil society organizations, the private sector, academia and local communities). Each of these constituencies can bring specific resources, knowledge and technical capacities to support collaborative climate action.

There is an urgent need to develop and strengthen the capacities of local and regional governments to implement climate solutions, particularly in developing countries. Given the complex and context-specific impacts that climate change can have, cities are often best placed to develop tailored, locally appropriate solutions to the challenges that communities and ecosystems face. Yet in many countries, local authorities face significant resource and capacity constraints to do so. In addition to financial shortfalls that leave them dependent on national governments, it is often the case that cities have limited political space to act autonomously on climate action. However, when conditions permit, cities have demonstrated their ability to pioneer progressive responses to climate change.

Cities and regions across the world are increasingly engaging in multilateral initiatives to advocate for stronger climate action. Networked, bottom-up movements led by cities are increasingly playing a key role in global climate governance. These initiatives are driving

multilateral cooperation around urban climate action, not only leading to greater emphasis on local-level efforts in international policy discussions, but also expanding the space for cities to inform, guide and implement these efforts. Increasingly, successful initiatives by cities are now being scaled up with national and international support to achieve an even wider impact.

Hybrid governance approaches, characterized by multi-stakeholder and cross-sectoral collaboration, offer a powerful alternative to conventional top-down approaches to climate action. Bringing together a range of actors at different levels, from the national to the local, not only has the potential to disrupt established hierarchies but also create positive synergies between different constituencies. These partnerships have the potential to facilitate "innovative spaces" where groups often marginalized from conventional decision-making structures, such as Indigenous Peoples, can contribute their unique knowledge and perspectives to resilience-building efforts. Similarly, city networks present an innovative model for local governments in highly centralized contexts where there is limited space for cities to operate independently.

Key Messages

Effective climate action requires multi-level governance and collaboration across different scales. Effective climate governance calls for collaboration and coordinated solutions at all levels. While multilateralism provides the climate agenda a platform for collective action—enabling countries to pool resources, share knowledge and coordinate efforts on a global scale—localizing the Sustainable Development Goals, including Goal 13, is essential. Localization ensures that the global development agenda is not just a set of distant goals and targets, but an implementable framework that is impactful at the local level.

Increasing local capabilities to facilitate and manage adaptation initiatives is vital. It is often difficult to implement city-led actions in practice because of gaps in expertise or funding. In many countries, there has been inadequate support from national governments in terms of funding or policy guidance to support local action. This calls for innovative measures to overcome these challenges, such as cooperative mechanisms for cities and regions to share technical expertise and resources. At the same time, cities should seek to unlock the transformative potential of locally-led climate action through partnerships between local communities, various levels of government, international organizations, the private sector and other stakeholders.

Strengthening the co-existence of formal and informal governance systems offers valuable opportunities to accelerate climate action. The continued exclusion of informality from official decision-making structures is a roadblock to building inclusive resilience in many cities. At present, the rich evidence base of community knowledge on local vulnerabilities and the vast array of resident-led efforts in areas like disaster preparedness are being overlooked. Even when local governments are committed to mounting a meaningful response to climate change, the effectiveness of their interventions is often undone by their failure to engage informal settlement communities, Indigenous Peoples and other groups sidelined from formal governance processes.

Knowledge transfer should be a two-way process, with an emphasis on scaling up local experiences and best practices. Training and capacity development should not only involve technical support and expertise from national to local governments, but also bottom-up processes whereby cities can share their experiences and success stories. This can only be done if inclusive platforms are in place to facilitate these exchanges. With these structures in place, national governments have the opportunity to learn directly from cities and coordinate the replication or expansion of their climate actions elsewhere.

Chapter 8:

Fostering Innovation for Inclusive Climate Action in Cities

Innovation is a crucial catalyst of climate action that cities, with their concentration of knowledge and resources, are especially well placed to cultivate. Importantly, innovation encompasses not only the rollout of "new" or "advanced" inventions, but also the reconfiguration of institutions and systems to achieve positive social and environmental aims. However, it is not the case that innovation is inherently positive: without proper consideration of its wider inequalities and vulnerabilities, it can reinforce existing patterns of exclusion and even create new ones for disadvantaged groups. For cities, the challenge is to reimagine innovation beyond a specific invention, place or creative class, instead facilitating an open and equitable forum for debate, knowledge exchange and collaboration that is inclusive of all residents and their needs. With these conditions in place, cities can achieve far-reaching and transformative outcomes of their existing social and environmental vulnerabilities and injustices.

Key Findings

Cities can accelerate climate action through an integrated process of innovation that supports low-carbon transitions. While technological innovations like renewable energy sources and electrified vehicles show promise, they alone cannot break the dependencies on unsustainable economic pathways. An integrated, inclusive and coordinated approach—including nature-based, financial and social innovations—is necessary to unlock the transformative potential of innovation. Social innovation, in particular, plays a critical role in the transition to more inclusive, resilient cities. It entails the creation of new institutional and social practices that drive behavioural change and promote broader participation to build collective resilience.

Integration and coordination across the three domains of innovation—technological, nature-based and social—is necessary to unlock co-benefits and optimize synergies for realizing climate-resilient cities. Cities are particularly well placed to drive socially inclusive, sustainable innovation because of the concentration of people and resources they bring, making them ideal for experimenting and pioneering social and technological solutions to climate change. However, thinking of the transition towards net zero requires looking

beyond specific innovations to consider the wider shifts needed in existing technologies, infrastructures and the supporting ecosystems towards more sustainable social practices and economic systems. These include appropriate governance and institutional conditions that enable the sharing, diffusion and co-creation of innovation.

Innovation can result in adverse outcomes for disadvantaged groups, such as low-income urban residents, if inequalities are overlooked. Climate innovation is shaped by established structures of power and privilege, which influence priorities and how complex trade-offs and ethical dilemmas are resolved, often disproportionately impacting disadvantaged groups. Ignoring these inequalities risks the creation of new forms of climate urbanism that reproduce or worsen existing injustices. A people-centered approach not only addresses what innovations are prioritized, but also how they are developed and who is involved: broadening participation to a diverse range of actors, from grassroots members to local institutions, is crucial for advancing a just urban transition.

The influence of the global climate agenda on urban innovation is not well integrated or clearly framed. Comparative analysis of the Nationally Determined Contributions shows that over two-thirds of NDCs recognize innovations (including nature-based, financial and social innovations) as a strategy for climate-resilient development. However, a sectoral approach still dominates with energy, the built environment and transport receiving more attention related to the urban environment. The insufficient focus on the spatial dimensions of innovation presents a missed opportunity to address trade-offs and unlock synergies across various interventions beyond the sectoral approaches that operate through Avoid-Shift-Improve strategies.

Key Messages

There is an opportunity for national governments during the third revision of Nationally Determined Contributions in 2025 to strengthen their focus on urban innovation. To close the implementation gap, it is crucial to strengthen the linkages between the sectoral approach to innovation and the places where they will be applied, with cities playing a significant role. National governments can do this by supporting an integrated approach within the framework of Nationally Determined Contributions that builds partnerships across sectors and actors and aligns urban innovation with their broader targets. The stronger alignment across spatial and administrative levels—from city to regional to national—will further leverage co-benefits and minimize redundancies between sectoral-based interventions.

Policy and planning at the national level should support inclusive innovation to achieve resilient cities. A supportive national agenda can catalyze and integrate inclusive innovation into large-scale actions. National governments can lead in setting appropriate institutional and regulatory conditions that address the injustices associated with climate innovation, as well as adopt national and regional policies to guide a just urban transition. Policy approaches could include subsidies, tax breaks, regulations, public procurement drives, financial incentives for adoption and certification schemes for climate actions that bring added social benefits to marginalized households and communities.

Local governments can actively foster inclusive innovation ecosystems, particularly when tied to local development agendas, to address community needs. City governments can drive policies that broaden the range of innovation actors and promote knowledge exchange between a wide range of stakeholders. This could include policies that enable innovation arenas such as urban labs and knowledge exchange forums, as well as those that promote access to information, skills and resources for diverse communities. By supporting small producers, informal providers and small-scale operators, local governments can help integrate these groups into the innovation process and address gaps created by their exclusion.

Public institutions, private sector entities and civil society organizations all have a key role to play in advancing inclusive innovation. While government bodies, development agencies and other actors are crucial in facilitating cross-context learning and promoting enabling conditions for innovation, activist groups and networks can drive the development of ethical principles to shape innovation processes. Businesses can also contribute their specific skill sets to socially valuable innovations and participate in collaborative innovation processes, such as innovation platforms or cluster innovations. Intermediaries such as universities and think tanks can also support innovation development or create sustained partnerships.

Chapter 9:

Financing Interventions for Climate Change in Cities

Despite increasing recognition of their importance in winning the climate battle, cities continue to struggle to access adequate financial resources. Currently, most cities lack sufficient financing to deliver the level of climate action needed to ensure sustainable and climate-resilient urban futures. The reasons for this are complex and wide-ranging, rooted in part in the legal and systemic limitations of local authorities to raise own source revenue, coupled with reduced or irregular disbursements from national governments that are themselves overwhelmed by climate and growing debt challenges. While borrowing is a necessary consideration, cities are generally unable to secure loans or grants from financial institutions, leaving them reliant on national governments to negotiate for these external resources. To change this, cities need to embrace long-term and integrated planning for climate projects, working closely with regional and national governments, as well as local and international financial institutions, to facilitate better financial access for cities. This support should be accompanied by capacity building and technical assistance to ensure local governments have the necessary systems in place to deliver climate action effectively. Local governments can also explore various measures to enhance their own revenue streams and further

incentivize other actors, including private enterprises, households and communities, to invest in climate action.

Key Findings

Cities are receiving less than 20 per cent of the finance required for effective climate action and are struggling to attract financing, particularly for small-scale local projects. Cities and other urban areas require an estimated US$4.5-5.4 trillion annually up until 2030 to invest in new or retrofitted climate-resilient infrastructure across transport, energy, water and waste, and telecom projects. In 2021-2022, cities only secured US$831 billion per year for climate action. Although the amount of climate finance flowing to cities has more than doubled in the past five years, it remains grossly insufficient to support effective climate action. Cities also face hurdles in accessing finance for local-level climate projects: many projects, while too large for cities to finance through their own budgets, are considered too small by external donors. One useful approach taken by cities is aggregating urban projects, through collaboratively integrating climate actions beyond the city level to improve borrowing power.

The growing imbalance between financing adaptation and mitigation has a more severe impact on the effectiveness of climate action at the city level. In 2021-22, only US$10 billion or just over 1 per cent of the tracked US$831 billion for urban climate action went towards adaptation. This leaves many cities and communities exposed to the impacts of extreme weather events associated with climate change. These impacts disproportionately affect vulnerable groups, especially low-income informal urban communities with limited resources and capacities to respond, weakening the effectiveness of urban climate action.

No single source can deliver the scale and speed of urban climate finance needed. Notwithstanding the varying projections of financing needs, there is a substantial gap between the financing that is currently available and what is needed for effective urban climate action. While national and local governments can direct more of their own resources, the high upfront costs of resilient infrastructure far exceed the resources at their disposal. Well designed, affordable loans and credit can offer a lifeline for cities to invest in climate solutions that will over the longterm pay off through averted damage, enhanced investor security and a range of other social and environmental benefits.

There is significant potential for local governments to scale up land-based revenue sources to finance urban climate action. At present, land rates, property taxes and land value capture tools—such as infrastructure levies, charges on underused land, and development rights—account for only 3.1 per cent of local government's revenue. However, these can be significantly scaled-up as the tools to operationalize them are largely within the control of local governments, including land use regulations, urban design (including parks and green spaces) and urban mobility planning. Additionally, enhancing these revenue sources can improve local governments' creditworthiness, enabling them to access external financial resources at favorable terms.

Reforms to improve access, efficiency, alignment and equity in the international financial systems can enhance the quantity and quality of climate finance available for cities. The ongoing global discussions outline a growing awareness that an equitable transition is crucial for effective climate action. It is anticipated that a higher-value New Collective Quantified Goal aligned with the Paris Agreement will be signed off at the 2024 COP29 in Baku, to replace the US$100 billion per year target. This could yield significant amounts of low-cost capital for developing countries, focusing on adaptation and resilient infrastructure, with positive ripple effects to the city level. The recognition of loss and damage as a third pillar of climate finance—in addition to adaptation and mitigation—further advances climate justice, with strong relevance to cities and other urban areas where a growing majority of the world's population reside.

Key Messages

To develop bankable projects, cities need to adopt an integrated approach through stronger vertical and horizontal collaboration. Strengthening preparation capacity is essential for improving the financial feasibility of projects. However, to scale up the impact of urban climate finance, local governments should align urban climate actions with projects and plans at the regional and national levels. Collaborating with other levels of government to aggregate projects, synchronize bankable projects, leverage economies of scale and reduce the transaction costs associated with smaller projects would make them more appealing for financing, and at more favorable terms.

Borrowing from private sources and tapping into global climate funds is necessary for cities to close the financing gap, but this must be approached strategically. Public sources of finance alone cannot deliver the required scale of urban climate finance. Cities need to engage with private capital providers and leverage diverse financing instruments in ways that are complementary. Global efforts to increase and align the flow of affordable climate finance, especially to developing countries, holds great promise for financing urban climate action. Cities should actively collaborate at regional and national levels to access global sources of climate finance.

Cities need to enhance their creditworthiness and risk profiles to attract financing at favorable terms, especially from private sources. This can be achieved by strengthening city planning, budgeting and financial management systems, including the broader city finance system beyond climate finance, as well as enhancing own revenue collection such as those from land-based income sources. The process of achieving an investment-grade credit rating improves the city's capacity to attract more finance and at more favorable terms. At a project level, with the support of national governments as guarantors and brokers, credit enhancement mechanisms such as credit guarantees, revenue guarantees, first-loss provisions, collateral, loan syndication and insurance can help to make a project bankable.

Cities need to leverage a blend of financial sources for urban climate action. When it comes to financing at the local level, context

really matters, with no "one-size-fits- all" approach. It is not only necessary to secure the required levels of financing, but how the different mechanisms and instruments are integrated. Planning and preparing bankable projects within a vertically and horizontally coherent framework, potentially with the support of development finance institutions, is central to unlocking financing for climate interventions. Blended finance helps make projects bankable by combining different instruments to balance risk and attract financing. National governments and financial institutions can help leverage financing through de-risking mechanisms that can incentivize investments in projects that might otherwise be regarded as too high-risk.

Chapter 10:

Building Climate Resilience in Urban Areas

The final chapter looks forward to envision how cities can achieve the transformative change needed to thrive in the face of the climate crisis. While the alarm was raised decades ago on the imminent threats posed by climate change, with UN-Habitat one of many voices calling for urgent action at the local level, the world has yet to see anything close to the required scale of mobilization and investment in response. However, with the right will in place and working together with all stakeholders, including the most marginalized communities, national and local governments can greatly enhance urban resilience while delivering a wider agenda of social inclusion and environmental justice. The more equitable a city is, the better placed it will be to withstand the impacts of climate change and maintain momentum in the coming years.

Key Findings

The intersecting challenges of climate change and urbanization have been on the global development agenda for decades, yet action on the ground is still failing to keep pace with the worsening impacts. Indeed, these issues have been articulated with increasing urgency for years without being meaningfully acted on. However, the narrowing window of opportunity to implement the changes needed still allows for cities to shift course. Through an inclusive, multi-stakeholder approach to resilience building that embraces innovation, local knowledge and a bold vision of transformation that addresses the root causes of vulnerability, cities can pursue a range of pathways towards a more sustainable and secure future.

Cities are only as resilient as their most vulnerable inhabitants: urban resilience cannot be achieved without putting fairness and equity at the centre of urban climate action. Exclusion drives vulnerability, leaving large parts of the urban population exposed. Inclusion must therefore be prioritized in any efforts towards urban resilience. A broader notion of vulnerability needs to consider the different drivers of discrimination people face in urban environments, including gender relations and gender conformity, race, disabilities, ethnic origin and sexual orientation. The best way to ensure resilience interventions resolve rather than exacerbate these issues is to include diverse perspectives in mitigation and adaptation planning, particularly the perspectives of communities with place-based experiences of climate change risks.

Most of the solutions cities need to respond decisively to climate change are already available. Though many local governments in developing countries lack the capacity and resources to enact wide-ranging climate programmes, they can focus their efforts on achieving whatever first steps are feasible on their journey towards greater resilience. For instance, in the area of risk assessment, while smaller urban areas may generally lack the technical capacity to undertake sophisticated scenario modelling, the widespread availability of accessible socioeconomic and geospatial data means that most urban areas can develop simple hazard maps that can contribute to reducing their vulnerability. Ensuring that any investments in immediate needs, such as infrastructure or housing, incorporate even low-cost adaptive elements will help reduce vulnerability.

Resilience interventions achieve the greatest impact when they harness local resources and deliver collective benefits, such as infrastructure and service provision. Well designed, community-led actions can leverage local skills and knowledge that may previously have been overlooked, and have the added benefit of sustaining community buy-in over the long-term. Thus, resilience efforts should wherever possible align long-term objectives with the immediate, pressing needs of residents in areas such as services and housing. These incremental actions, while potentially appearing at first glance to be small-scale or highly localized in their impacts, may over time develop into transformative, city-wide change.

Key Messages

Resilience should be negotiated with communities, rather than imposed on them: a negotiated approach to building resilience can open up different perspectives, identify trade-offs and enable the most vulnerable to define what form it should take. Such an approach, commencing at the beginning of the planning process, will allow a range of stakeholders to explore what to prioritize, how it should be delivered and who should be involved. This process should be open to contestation and diverse viewpoints, especially among those traditionally excluded from decision-making. Most importantly, negotiation is a vital counter-point to the imposition of resilience on communities. Even supposedly participatory approaches that engage local residents in implementation can be disempowering if they are not given the opportunity to define the fundamental aims and mechanisms from the outset.

City authorities should move beyond traditional top-down hierarchies to embrace their role as coordinators, striving to engage a broad range of stakeholders to share responsibility for climate resilience. Local governments should diversify the range of actors involved in decision-making and engage the private sector, civil society organizations and individual residents as collaborators and partners. Though it is important that this process of diffused responsibilities does not leave local communities to bear the burden of

climate action alone, authorities can nevertheless empower different stakeholders to lead in areas where their knowledge and skills qualify them to do so. Compared to the limited boundaries of conventional participation that is still widely practiced, this approach requires local authorities to fundamentally reconfigure their own position as dominant power brokers and serve as facilitators instead.

Urban resilience is not a fixed end-point that cities reach through a single prescribed pathway, but rather a horizon to travel towards through incremental steps. Resilience building should not be seen as an isolated target that can be achieved through one-off investments, no matter how large, but a continuous process to be mainstreamed into day-to-day urban management practices. In this regard, cities can achieve the most significant impact through low-profile, small-scale interventions across different sectors and communities that over time accumulate into substantial resilience gains. Many actions to advance urban resilience are "low-hanging fruit": initiatives that require minimal resources to activate once urban communities are aligned with these efforts.

Rather than focusing on the specific, immediate symptoms of climate change, cities should embrace a more holistic approach that addresses the root causes of vulnerability. Responding to increased flooding risk with the construction of dykes or sea walls may benefit some areas in the short-term, for example, but without a wider understanding of the social and environmental dynamics at play these interventions may soon become obsolete or exacerbate impacts elsewhere. National and local governments, businesses, civil society organization and communities should instead work together to ensure more equitable, sustainable cities that by protecting all residents ensure lasting resilience in the coming decades.