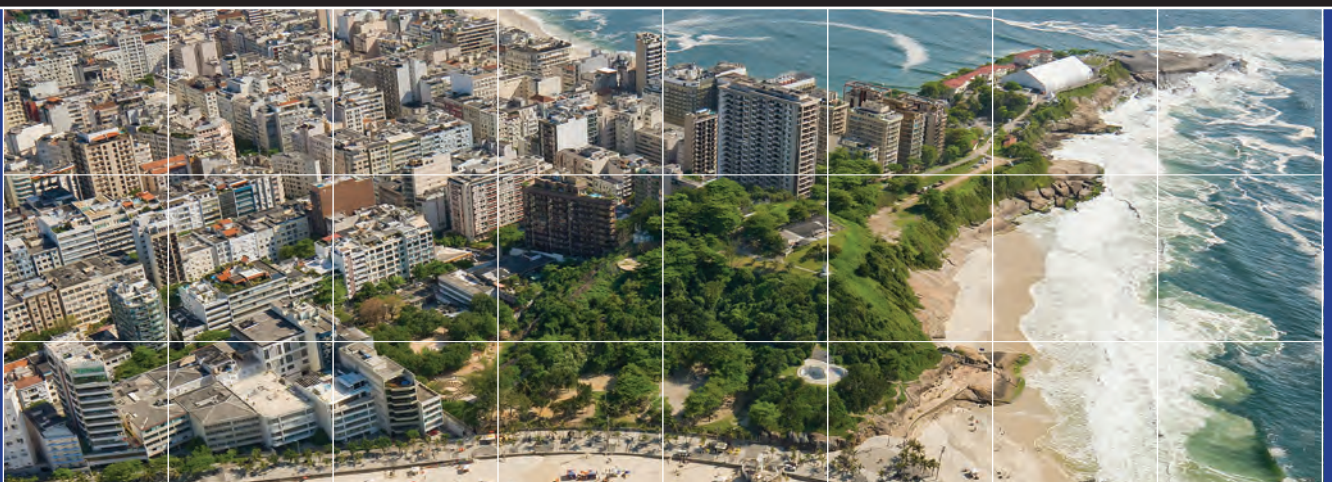




# GLOBAL REPORT ON HUMAN SETTLEMENTS 2011 **CITIES AND CLIMATE CHANGE**

UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME





# CITIES AND CLIMATE CHANGE



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## GLOBAL REPORT ON HUMAN SETTLEMENTS 2011

**United Nations Human Settlements Programme**

**UN  HABITAT**

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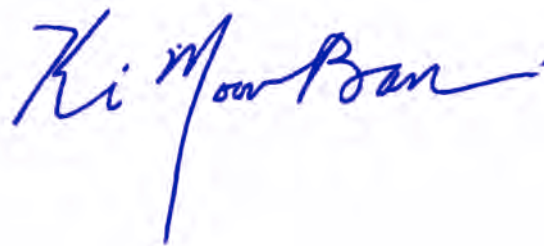
# FOREWORD

In the decades to come, climate change may make hundreds of millions of urban residents – and in particular the poorest and most marginalized – increasingly vulnerable to floods, landslides, extreme weather events and other natural disasters. City dwellers may also face reduced access to fresh water as a result of drought or the encroachment of saltwater on drinking water supplies. These are the forecasts, based on the best available science. Yet none of these scenarios needs to occur, provided we act now with determination and solidarity.

This year's edition of UN-Habitat's *Global Report on Human Settlements* elucidates the relationship between urban settlements and climate change, and suggests how cities and towns that have not yet adopted climate change policies can begin to do so. The report details the possible impacts of climate change on cities and towns. It also reviews mitigation and adaptation steps being taken by national and local authorities, and assesses their potential to shape future climate change policy.

Urban development has traditionally been seen as a national concern. This report shows its international relevance. Cities and towns contribute significantly to climate change – from the fossil fuels used for electricity generation, transport and industrial production, to waste disposal and changes in land use.

I commend this report to all concerned with improving the ability of towns and cities to mitigate climate change and adapt to its impacts. How cities and towns are planned affects not just the health and well-being of their inhabitants, but the global environment and our prospects for sustainable development.



**Ban Ki-moon**  
*Secretary-General*  
*United Nations*

# INTRODUCTION

The effects of urbanization and climate change are converging in dangerous ways that seriously threaten the world's environmental, economic and social stability. *Cities and Climate Change: Global Report on Human Settlements 2011* seeks to improve knowledge, among governments and all those interested in urban development and in climate change, on the contribution of cities to climate change, the impacts of climate change on cities, and how cities are mitigating and adapting to climate change. More importantly, the Report identifies promising mitigation and adaptation measures that are supportive of more sustainable and resilient urban development paths.

The Report argues that local action is indispensable for the realization of national climate change commitments agreed through international negotiations. Yet most of the mechanisms within the international climate change framework are addressed primarily to national governments and do not indicate a clear process by which local governments, stakeholders and actors may participate. Despite these challenges, the current multilevel climate change framework does offer opportunities for local action at the city level. The crux of the challenge is that actors at all levels need to move within short time frames to guarantee long-term and wide-ranging global interests, which can seem remote and unpredictable at best.

An important finding of the Report is that the proportion of human-induced (or anthropogenic) greenhouse gas (GHG) emissions resulting from cities could be between 40 and 70 per cent, using production-based figures (i.e. figures calculated by adding up GHG emissions from entities located within cities). This is in comparison with as high as 60 to 70 per cent if a consumption-based method is used (i.e. figures calculated by adding up GHG emissions resulting from the production of all goods consumed by urban residents, irrespective of the geographic location of the production). The main sources of GHG emissions from urban areas are related to the consumption of fossil fuels. They include energy supply for electricity generation (mainly from coal, gas and oil); transportation; energy use in commercial and residential buildings for lighting, cooking, space heating, and cooling; industrial production; and waste.

However, the Report concludes that it is impossible to make accurate statements about the scale of urban emissions, as there is no globally accepted method for determining their magnitude. In addition, the vast majority of the world's urban centres have not attempted to conduct GHG emission inventories.

The Report argues that, with increasing urbanization, understanding the impacts of climate change on the urban environment will become even more important. Evidence is mounting that climate change presents unique challenges for urban areas and their growing populations. These impacts are a result of the following climatic changes:

- Warmer and more frequent hot days and nights over most land areas;
- Fewer cold days and nights in many parts of the world;
- Frequency increases in warm spells/heat waves over most land areas;
- Increased frequency of heavy precipitation events over most areas;
- Increase in areas affected by drought;
- Increases in intense tropical cyclone activity in some parts of the world; and
- Increased incidence of extreme high sea levels in some parts of the world.

Beyond the physical risks posed by the climatic changes above, some cities will face difficulties in providing basic services to their inhabitants. These changes will affect water supply, physical infrastructure, transport, ecosystem goods and services, energy provision and industrial production. Local economies will be disrupted and populations will be stripped of their assets and livelihoods.

The impacts of climate change will be particularly severe in low-elevation coastal zones, where many of the world's largest cities are located. Although they account for only 2 per cent of the world's total land area, approximately 13 per cent of the world's urban population lives in these zones – with Asia having a higher concentration.

While local climate change risks, vulnerabilities and adaptive capacity vary across cities, evidence suggests some key common themes. First, climate change impacts may have ripple effects across many sectors of city life. Second, climate change does not impact everyone within a city in the same way: gender, age, race and wealth have implications for the vulnerability of individuals and groups. Third, in terms of urban planning, failure to adjust zoning and building codes and standards with an eye to the future may limit the prospects of infrastructure adaptation and place lives and assets at risk. Fourth, climate change impacts can be long-lasting and can spread worldwide.



In proposing the way forward, following a global review of climate change mitigation and adaptation measures taken by cities all over the world, the Report emphasizes that several principles are fundamental to an integrated, multipartner approach towards climate change action at the urban level:

- No single mitigation or adaptation policy is equally well-suited to all cities;
- It would be beneficial to take an opportunity/risk management approach in a sustainable development perspective, considering not only emissions, but also risks that are present in a range of possible climate and socioeconomic futures;
- Policies should emphasize, encourage, and reward ‘synergies’ and ‘co-benefits’ (i.e. what policies can do to achieve both developmental and climate change response goals);
- Climate change policies should address both near-term and longer-term issues and needs; and
- Policies should include new approaches that support multiscale and multisector action, rooted in the different expectations of a wide range of partners.

The Report suggests three main areas in which the international community can support and enable more effective urban mitigation and adaptation responses:

- Financial resources need to be made more directly available to local players – for example, for climate change adaptation in vulnerable cities, for investment in a portfolio of alternative energy options, and in mitigation partnerships between local governments and local private sector organizations;
- Bureaucratic burdens on local access to international support should be eased, with the international community helping to create direct communication and accountability channels between local actors and international donors; and
- Information on climate change science and options for mitigation and adaptation responses should be made more widely available by the Intergovernmental Panel on Climate Change (IPCC), the United Nations and other international organizations, including available knowledge on observed and future climate impacts on urban centres, on urban-based mitigation and adaptation alternatives, and on the costs, benefits, potentials and limits of these options.

With respect to the national level, the Report suggests that national governments should use the following mechanisms to enable mitigation and adaptation actions at the local level:

- Engage in the design and implementation of national mitigation strategies and adaptation planning;
- Offer tax rebates, tax exceptions and other incentives for investments in alternative energy sources, energy-efficient appliances, and climate-proof infrastructure, houses and appliances, among other climate change mitigation and adaptation actions;
- Encourage appropriate climate responses (for example, redesign policies enacted with other issues in mind or in periods prior to climate change, such as flood protection policies that can result in maladaptations);
- Enhance coordination and streamlining between sectoral and administrative entities (for instance, make sure that decisions by one city to protect coastal areas with barriers do not have impacts on basins that are suppliers of fresh water, or wetland ecologies that are important to the economic base of that city or other cities inland);
- Develop partnerships with non-governmental actors to share risks (for example, national governments can work with private insurance providers to offer protection to each city without requiring each to make a sizeable investment in order to reduce risks from a particular kind of low-probability threat); and
- Anticipate and plan for the possibility of much more substantial climate change impacts and adaptation needs in the longer term than those that are currently anticipated in the next decades.

For the local level, the Report suggests, broadly, that urban policy-makers should begin from an awareness of local development aspirations and preferences, local knowledge of needs and options, local realities that shape choices, and local potential for innovation. In this context, urban local authorities should:

- Develop a vision of where they want their future development to go and find ways to relate climate change responses to urban development aspirations;
- Expand the scope of community participation and action by representatives of the private sector, neighbourhoods (especially the poor) and grassroots groups, as well as opinion leaders of all kinds, in order to ensure a broad-based collection of perspectives; and
- Using an inclusive, participatory process, cities should conduct vulnerability assessments to identify common and differentiated risks to their urban development plans and their different demographic sectors, and decide on objectives and ways to reduce those risks.

To achieve more effective policies, local governments need to expand the scope, accountability and effectiveness of participation and engagement with non-governmental organizations (NGOs), such as community and grassroots groups, the academic sector, the private sector and opinion leaders. Effective engagement with NGOs will serve multiple purposes:

- It will become a source of innovative options, as well as both scientific and locally relevant knowledge;
- It will allow participants to understand and mediate the diverse perspectives and interests at play; and
- It will provide broad-based support for decisions and promote knowledge on the causes of emissions and vulnerabilities, as well as mitigation and adaptation options thus achieved.

Partnerships with the private sector and NGOs are of special relevance in this context. For example:

- Resources from international, national and local private organizations can be mobilized to invest in the development of new technologies, housing projects and climate-proof infrastructures, and to assist in the development of climate change risk assessments; and
- The widespread involvement of NGOs in climate arenas as diverse as climate awareness and education and disaster relief should be welcomed – the inputs and perspectives of these organizations can be harnessed to help develop a more integrated urban development planning.

Finally, the Report suggests that broad-based oversight organizations, such as advisory boards, representing the interests of all actors, should be created to help avoid the danger that private or sectarian interests may distort local action (for instance, by investing in technologies, infrastructures and housing that only benefit a minority, or by hijacking the benefits of grassroots funding). This is especially of concern in urban areas within countries that have experienced strong centralized control in the hands of local elites and state agents, but the principle of broad-based oversight can and should be practised everywhere.

Many towns and cities, especially in developing countries, are still grappling with the challenges of how to put in place climate change strategies, how to access international climate change funding and how to learn from pioneering cities. I believe this Global Report will provide a starting point for such towns and cities. More generally, I believe this Report will contribute to raising global awareness of the important role that cities can and should play in the mitigation of greenhouse gas emissions and in adapting to climate change.



**Dr Joan Clos**

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# LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
BRT	bus rapid transit
C40	Cities Climate Leadership Group
CCCI	Cities and Climate Change Initiative (UN-Habitat)
CCP	Cities for Climate Protection Campaign (ICLEI)
CDM	Clean Development Mechanism
cm	centimetre
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
Convention, the	United Nations Framework Convention on Climate Change
COP	Conference of the Parties (to the UNFCCC)
EU	European Union
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
ha	hectare
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
kW	kilowatt
kWh	kilowatt hour
km	kilometre
m	metre
mm	millimetre
MW	megawatt (1MW = 1000kW)
MWh	megawatt hour (1MWh = 1000kWh)
NAPA	National Adaptation Programme of Action
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
RMB	Chinese yuan
TWh	terawatt hour (1TWh = 1 million MWh)
UCLG	United Cities and Local Governments
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlements Programme
US	United States
WMO	World Meteorological Organization