Subnational climate change adaptation and mitigation: challenges and opportunities for urban settlements

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Mean surface temperature has increased 0.85 °C since 1880.
Oceans have warmed since 1971 affecting warm and cold currents
Absorption of ever-increasing quantities of CO2 by oceans has caused their acidification by about 26% with negative implications for marine biodiversity
Sea level has increased 19 cm since 1901.
There is an important ice mass loss in the Arctic and Greenland
Mean surface temperature could increase to 2.7º C if the INDCs of the Paris Agreement are actually achieved
If INDCs are fully achieved, as presented in the Paris Agreement, the average global temperature will increase beyond 2°C as a consequence of adding 55 Gt of GHG.

The IPCC 1.5 °C Special Report (October, 2018) subscribes that global climate change governance will rely on what cities may contribute through the design and implementation of subnational climate change adaptation and mitigation strategies.
Cities as drivers

Share of the Urban Population Worldwide

- **1980**: 1.731 billion (39%)
- **2015**: 3.968 billion (54%)
- **2050**: 6.419 billion (66%)


Share of Urban Population on all Continents

- North America: 82%
- Europe: 52%
- Asia: 48%
- Latin America: 38%
- sub-Saharan Africa: 80%
- Australia/Oceania: 71%

Source: United Nations Department of Economic and Social Affairs (UNDESA) 2016, online database.

**URBAN DEVELOPMENT CHALLENGE**

Building infrastructure for fast-growing cities in developing countries could release 226 gigatonnes (Gt) of carbon dioxide by 2050 — more than four times the amount used to build existing developed-world infrastructure. To curb emissions, cities need low-carbon construction, alternative transport and better planning and design.

Energy transition: (1) diversification or sources; (2) improve S&T funding for renewables; (3) move towards a decentralized scheme of energy production; (4) energy efficiency; (5) reduction of consumption patterns; (6) low carbon transport, non-motorized mobility & Transport Oriented Development.

- Improve land use / land planning and consequently infrastructure (including green and blue), mobility, public space, urban equipment, etc.
- Sustainable architecture and bioclimatic design
- Urban land reserves and mid- and long-term planning
- Climate budget development at the urban scale + green jobs
- Diversification of funding (international funding, increasing local value capture, PPPs, etcetera) and insurance

Only around 60% of countries incorporate an urban dimension into their national plans, according to UN Habitat.

Current commitments by local and regional governments have the potential to reduce 5 to 15 gigatons by 2020 to 2030.
SENDAI Framework
UN Sustainable Development Goal

SENDAI FRAMEWORK
Scope and Purpose
1 Global Outcome
1 Goal

7 Global Targets
13 Guiding Principles

4 Priorities for Action
at 4 Levels
Local, National, Regional and Global

Role of Stakeholders
International Cooperation and Global Partnerships

SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
<table>
<thead>
<tr>
<th>Country</th>
<th>Climate Change Law</th>
<th>CC National Plan</th>
<th>CC National Strategy</th>
<th>National Adaptation or Resilience Plan</th>
<th>Local CC or Resilience Plan</th>
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<td>(National CC Policy)</td>
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NC# = national communication, number of the NC, and year of registration.
Latin America's CC Legislative Action

**Risk**
- Torrential rains
- Flooding and landslides
- Temperature increases
- Heat islands / heat waves
- Drought
- Sea level rise
- Coastal invasion and erosion
- Saline intrusion and increase in the level of the water table

**Vulnerability**
- Vulnerability of large cities to climate hazards

**Adaptive Capacity**
- Extension/strengthening of the meteorological network*
- Risk maps*
- Early warning system* / Contingency plan
- Social communication of risk / Promotion of a culture of adaptation*
- Shelter network
- Capacity building / Training for public, private, and civil society organizations*
- Improved inter-secretarial and –sectorial coordination*
- Evaluation of the vulnerability of strategic public infrastructure to flooding in order to ensure its functioning
- Rainwater drainage network and other hydraulic infrastructure
- Green and/or blue infrastructure / renaturation / urban gardens
- Recovery or regeneration of ecosystem services / establishment of protected natural areas (public or private)*
- Inclusion of adaptation in land use planning and urban design / Containment of irregular urban expansion*
- Oversight of land use and occupation to reduce socio-environmental inequalities*
- Attention – relocation of vulnerable populations*
- Inclusion of gender dimension in monitoring and oversight of actions*
- Subsidies, financing*
- Risk transfer through financial schemes / Assurance / Public-private partnerships for resilience*
- Epidemiological surveillance / identification of vector-borne diseases*
- Geo-referenced identification of vulnerable populations
- Communication / warning of heat waves
- Training for public, private, and civil society organizations*
- Urban woodlands – other interventions in public spaces to mitigate the effects of heat islands
- Protective infrastructure
- Conservation of mangroves and/or dune systems
- Oversight of urban coastal development
- Creation of information on the development of hydrodynamic and other numerical models
- Regenerated water
- Creation of information on the development of hydrodynamic and other numerical models

* indicates a key action or intervention related to the climate change (CC) risk or vulnerability.
Low carbon urban transition: key challenges and opportunities

- The lack of information (climate and urban related) cannot hold back policy and local decision making processes.
- North–South cooperation is relevant but cannot be the only mechanism for climate change action at the local level, mainly because solutions for the Global North cannot merely be transplanted for the Global South.
- The development of novel platforms of knowledge, based on multi-stakeholders collaboration and co-production, is desirable for supporting policy making at the local level.
- Regional / national networks of local governments (and other key stakeholders) are valuable for sharing experiences, improve learning and enhance local capacities (e.g. Red Chilena de Municipios ante el Cambio Climático - redmunicc.cl).
- A better balance between adaptation and mitigation strategies is still needed. Opportunities in the long term can profit synergies and co-benefits while taking care of potential trade-offs.
- Private sector engagement and coordination with governments actions can still be improved.
- Climate change action should be seen as part of the local and national development agenda as a way to better support the transit towards more sustainable and resilient development pathways.
The inner circle (orange) presents key crosscutting issues and knowledge gaps for a step-change of knowledge generation on cities and climate change. The middle circle (multi-coloured) presents six topical research areas where more evidence is needed to inform action. The external circle (green) presents three suggested approaches that may facilitate implementation of this Research and Action Agenda.
IPCC Cities Research Agenda

Thank you!!

Mexico, 2017.
Available at:
www.pincc.unam.mx/IMG/ccsc/CCSC.pdf

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