

Cities face up to the Climate Challenge

December 7 2015, by David Funkhouser, Earth Institute, Columbia University



Jakarta, Indonesia. Credit: Somayya Ali Ibrahim

Millions of people living in cities around the world already feel the impacts of climate change: heat waves, flooded streets, landslides and storms. All of these affect important infrastructure such as transportation and water supplies, ports and commerce, public health and people's daily lives. And it is cities that are at the forefront of the response.

Experts from the Earth Institute attending the Paris climate summit are presenting a fresh report today on what's at stake for the world's growing urban population, and what many cities are doing to adapt. "Climate Change and Cities" is the Second Assessment Report of the Urban Climate Change Research Network, a consortium of 600 researchers

from around the world based at the Center for Climate Systems Research, part of the Earth Institute at Columbia.

"Cities and their citizens already have begun to experience the effects of [climate change](#). Understanding and anticipating these changes will help cities prepare for a more sustainable future," the report says. "This means making cities more resilient to climate-related disasters and managing long-term climate risks in ways that protect people and encourage prosperity. It also means improving cities' abilities to reduce [greenhouse gas emissions](#)."

The task is daunting: Each city has its own resources, needs and political dynamics. And the challenges are different for rich and poor nations. For instance, the report notes, "Urban transport emissions are growing at 2 to 3 percent annually. The majority of emissions from urban transport is from higher-income countries. In contrast, 90 percent of the growth in emissions is from transport systems in lower-income countries."

Tackling the problems involves work on many fronts, from urban planning to infrastructure, housing and hospitals to transit and waste removal. The problems are especially acute for coastal cities: The report projects that more than half of the global urban population will live in coastal zones by the middle of this century. Storm surges, erosion and salt water intrusion are already a problem in many places. "[S]ea level rise and climate change will likely exacerbate these hazards," the report says. It estimates annual losses from flooding along coastlines could amount to \$71 billion by 2100.



New Songdo City, under construction. Credit: angspud.blogspot.com

But while national leaders debate what to do about climate change, city officials around the world cannot afford to wait, and are already taking action. The report includes more than 100 case studies of what cities are doing to mitigate and adapt to climate change. The online "[Case Study Docking Station](#)" is meant to spread information about how cities are coping and offer models other cities can emulate. The report emphasizes the importance of integrating mitigation and adaptation strategies.

For instance, New York is well on the way to reaching a goal of planting

a million trees by 2017 (900,000 as of August 2014, the report says). The project serves to both mitigate and adapt to climate changes. Among other benefits, the trees absorb CO₂, helping to curb greenhouse gases; and by helping to lower air temperature in summer, they reduce the amount of energy used for cooling. They also improve air quality and reduce stormwater runoff.

The tree planting is one of more than 100 initiatives that are part of PlaNYC 2030, a broad strategy to support the long-term sustainability of the city. Following the devastation of Superstorm Sandy in 2012, New York also has adopted an aggressive strategy to build a more resilient shoreline, by upgrading building codes, protecting important infrastructure such as subways and power systems, raising bulkheads and building seawalls, and restoring wetlands and beach dunes.

A more dramatic [case study](#) comes from South Korea, where a whole new city is being built with sustainability in mind. New Songdo City, a \$35 billion development eventually projected to have 65,000 residents and a workforce of 300,000, incorporates the highest concentration of LEED-certified buildings in the world. Forty percent of the city will be green space. It will incorporate extensive public transit, pedestrian- and bicycle-friendly design and a cutting-edge waste collection that sends garbage out through a pneumatic system (in other words: no garbage trucks).

The city "aims to generate efficient energy use through 'ubiquitous' technology that uses the internet to link hardware and software to monitoring systems to generate efficient resource consumption. Consequently, Songdo consumes 40 percent less energy per capita than cities of similar scale," says the Songdo case study.

The "Climate Change and Cities" report being released Friday is an executive summary: The full report is still being prepared. But it offers

some key findings regarding disaster preparation; urban planning and design; public health, water and waste systems; transportation and energy systems; financing solutions and urban governance; protecting urban ecology; and insuring equitable approaches that encompass the needs of poor and low-income residents and neighborhoods.

The report outlines five "pathways to urban transformation":

- Disaster risk reduction and climate change adaptation are the cornerstones of resilient cities.
- Actions that reduce greenhouse gas emissions while increasing resilience are a win-win.
- Risk assessments and climate action plans co-generated with the full range of stakeholders and scientists are most effective.
- Needs of the most disadvantaged and vulnerable citizens should be addressed in climate change planning and action.
- Advancing city creditworthiness, developing robust city institutions, and participating in city networks enable climate action.

Provided by Earth Institute, Columbia University

Citation: Cities face up to the Climate Challenge (2015, December 7) retrieved 24 April 2024 from <https://phys.org/news/2015-12-cities-climate.html>

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