

ISSUE BRIEFS

Climate Injustice: Demographic Destiny *Cities, ever bigger, can lead the way*

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The following is the second in a series of Issue Briefs on Climate Injustice, written by Hunter College faculty members associated with Roosevelt House. Opinions expressed in these papers are those of the authors.

Introduction

The city is a cause and a victim of climate change. Urban activities are fueled by fossil energy that increases greenhouse gas emissions. Population density, on coasts and rivers, in arid areas and in fragile ecosystems, increases exposure to climactic climate events. The swelling global urban in-migration of rural poor people impairs cities' capacity for climate change resilience.

Paradoxically, urbanization may also be the best way to address climate change and the injustices it imposes. Density can bring energy efficiencies. Urban living allows reduced emissions. Urbanization stimulates technological and policy innovation. Indeed, because of a variety of governance experiments around the world, cities are being described as climate change first responders. Can they, as they respond, also allay the injustices that climate change inflicts on their most vulnerable populations? The test is to honestly acknowledge the climate change costs of urbanization and then weigh them against the benefits. The balance struck in this analysis: cautious optimism.

Climate injustice and urbanization

How societies define justice varies by culture, religion, law – and density. Humans have been urbanizing for centuries, but the past 60 years migration to cities has increased dramatically, with cascading effects on land use, environment and social change. It took 8,000 years for 30% of the world's population to be urbanized, until about 1950, when some 740 million were living in the world's cities. Since then, the level of urbanization has risen to about 47%, with more than 2.8 billion people living in cities. By 2050, demographers estimate there will be 3.5 billion more.

Studies suggest that urban areas can be large sources of the greenhouse gases that create global warming. Data are sparse, leaving researchers to depend on model outputs, but it is reasonable to estimate that urban activities account for about three quarters

of all the carbon dioxide emitted from energy-related consumption of fossil fuels. Developed cities like Sydney, Calgary, Stuttgart and several in the U.S. produce more than 15 tons of carbon dioxide per capita per year. Compare that with the global output of 4.8 metric tons CO₂ per capita. New York City produced about 6.5 tons per capita in 2012, about half the U.S. average. Yet within efficient New York City, there are substantial differences. Cosmopolitan jet setters produce more than lower-income residents, a disparity that is increasing.

Larger cities produce more total emissions than smaller cities. One study suggests that the 50 largest cities are responsible for approximately 40% of urban greenhouse gas emissions. Whether emissions per capita from larger cities differ from smaller cities remains debated. Certainly, developing cities produce lower emissions per capita than those of the developed world. For example, Mexico City, Buenos Aires and New Delhi produce, 4.3, 3.8, and 1.5 tons CO₂ per capita, respectively. Differences in emissions between cities are also influenced by the industrial sector. Those heavily engaged in fossil fuel extraction or energy production typically have higher per capita emissions than other cities. Finally, urban residents in the developed world pollute less than their rural counterparts, but this relationship is reversed in the developing world.

Urban exposure to climate hazards

City residents are increasingly vulnerable to the impacts of climate change. For example, we can expect that climate change will bring

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higher temperatures and precipitation, sea level rise and extreme events including heat waves, tropical cyclones and storm surges that affect cities massively. Flooding is already the most frequent and greatest natural hazard and exacts the highest human and economic costs. Between 1980 and 2014, over 3,700 flooding events globally affected approximately 3.3 billion people, killed 230,000 and caused \$619 million in damage.¹ By one estimate, over 634 million people live in flood-vulnerable low-elevation coastal zones, 360 million of them in cities and most of those in the developing world. That's not to say the developed world is immune. New Yorkers recently experienced extreme weather-related

and are subject to climate-related disasters, it's no wonder that they are denounced by some observers as environmental villains. These arguments have promoted policies in some developing countries to slow or stop urbanization. Yet cities and urbanization provide solutions to climate change. There are at least three answers to how.

First, rather than focus on what is wrong with urbanization, perhaps a more useful question is whether there are better alternatives. For example, compare urban and rural greenhouse gas emissions per capita. In the developed world, the major source of emissions, residents of urban areas emit less. Even in China, with

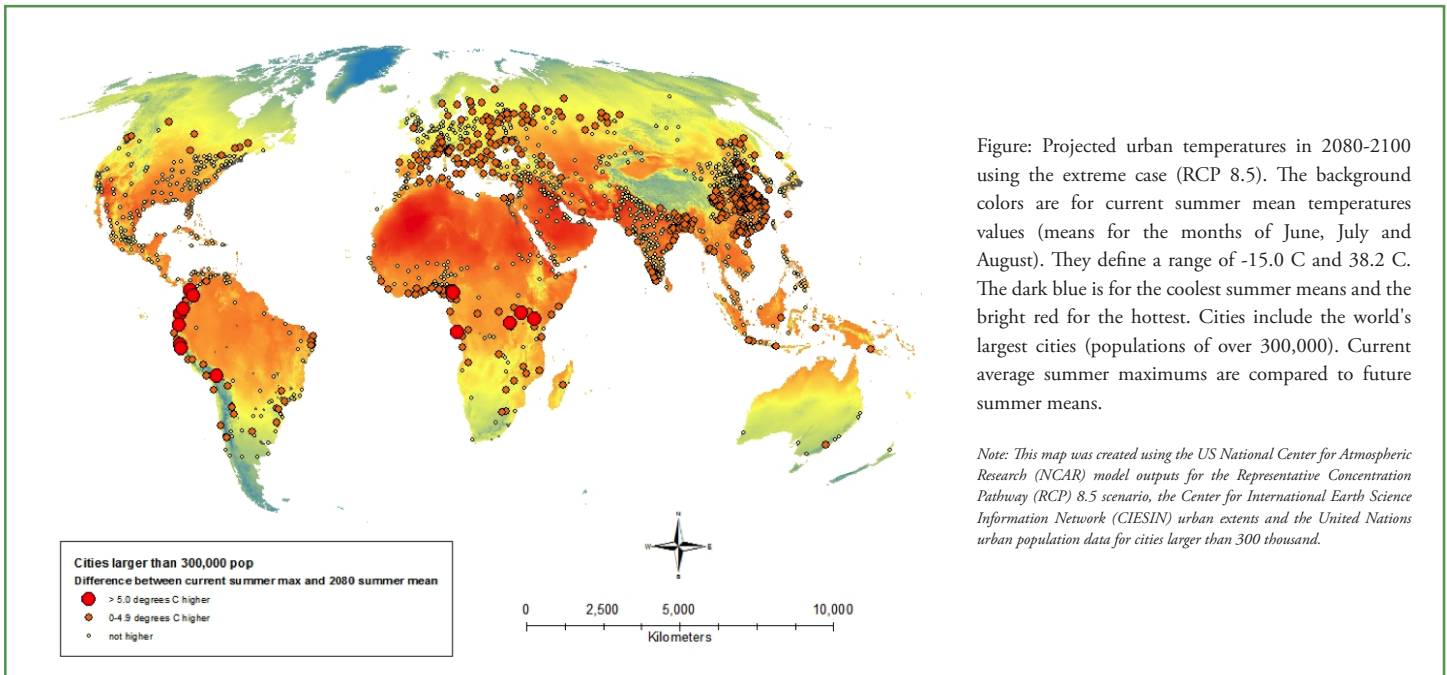


Figure: Projected urban temperatures in 2080-2100 using the extreme case (RCP 8.5). The background colors are for current summer mean temperatures values (means for the months of June, July and August). They define a range of -15.0 C and 38.2 C. The dark blue is for the coolest summer means and the bright red for the hottest. Cities include the world's largest cities (populations of over 300,000). Current average summer maximums are compared to future summer means.

Note: This map was created using the US National Center for Atmospheric Research (NCAR) model outputs for the Representative Concentration Pathway (RCP) 8.5 scenario, the Center for International Earth Science Information Network (CIESIN) urban extents and the United Nations urban population data for cities larger than 300 thousand.

flooding, and some experienced it much more than others.

Another climate-related threat for cities is heat waves. Recent heat disasters in Chicago and Western Europe are well known – and may augur widespread repetition. In a worst case scenario, between 2080-2100, among a sample of 1,437 cities, 419 cities may reach average summer temperatures equal to or greater than their current average maximum. The current population of these cities exceeds 609 million and most of them live in the developing world.

An important aspect of urbanization is the increasing concentration of poverty. Some scholars estimate that an increasing share of the world's poor will be in cities. At the same time, however, what's also increasing in cities is the number of wealthy people, who each create a substantially larger carbon footprint. There are now more than 13.7 million people with more than \$1 million in assets across 23 countries with a total wealth of approximately \$52.6 trillion.

How can cities provide solutions to climate change?

Given that cities are large sources of greenhouse gas emissions

¹ Note that official statistics on disaster deaths understate totals due to methods of data collection (for these data see, CRED - EM-DAT 2014).

such infamous air pollution, the per capita carbon dioxide footprint is less than it was in London and New York when they were in the same stage of development. If populations were spread out more evenly, each person would account for more. It is also true that urbanization, despite concentrating poverty, actually helps to relieve it. Scholars have estimated that urbanization in Brazil has helped to reduce poverty and inequality over the past several decades.

A second answer is that as global urbanization progresses, cities will become more efficient and better managed. This has been the experience of the developed world. As mentioned, the world is undergoing a great, second wave of urbanization. The first wave occurred between 1750 and 1950 and included a limited number of countries in North America, Oceania and Eastern Asia. Altogether, cities in these parts of the world added approximately 410 million people during this 200-year period. During the current wave, from 1950 to 2030, less than half the time, the world will add about 3.6 billion urban residents. This huge second wave is much messier due in large part to sheer size. As other regions urbanize, the flow of people to their cities will start to flatten out and cities in the developing world will be able to manage more effectively.

For the third answer, we look to how environmental challenges

were addressed in the past. Climate change is not the first environmental problem to confront cities. Indeed, during the first wave of urbanization, problems like limited access to fresh water and effective sanitation had terrible impact on residents. Urban environmental history in the U.S. shows how cities addressed these problems. Gordon McGranahan et al. (2001) and his colleagues suggest that as cities have developed, their environmental concerns have become more regional and longer-term. Solutions took decades to implement, but in the end were effective at the local and regional levels. The challenge of this age is not to look for ways to disperse their waste and pollutants, but to target the source of problems.

Urbanization and climate justice

Can cities also address climate injustice? The arguments put forth here suggest a cautious optimism. Lowering impact and vulnerability through the urbanization process will not correct injustice but can surely allay it.

Climate injustice is deeply embedded in social conditions. Dense settlement helps to assuage some of these effects, such as by providing employment and better living conditions than in rural communities, but lasting and effective change will not occur without radical changes in markets, governance and cultures. We know that better urban energy infrastructures and technologies that evolve away from carbon-based fuel are an important part of the solution, but they are only one part. As societies develop, they become more complex, hierarchies emerge and populations segregate along a number of different axes like wealth, status, income, and power. Moreover, as affluence increases so does consumption and waste. Natural environments degrade. Therefore, in addition to better technologies urban governance must attempt to de-couple all these trends. Then and only then will the urbanization process and urban growth be de-linked from climate change injustice. That is, climate injustice solutions have technical, social, cultural and ecological dimensions.

Urban governance can stimulate these changes and we already see glimpses of how. Climate solutions are emerging from the developing world and are being picked up in cities globally. Low-carbon policies like Bus-Rapid-Transit and congestion pricing were first adopted in developing world cities (Curitiba and Singapore, which started deploying congestion pricing 40 years ago, and making it steadily more sophisticated). These solutions are now being picked up by cities like New York, London and Shanghai. Meanwhile, cities are organizing politically to combat climate change. Groups like the C40, a network of cities in the developed and developing world, are collaborating to promote actions to reduce greenhouse gas emissions. In less than a decade such groups have become leaders in mitigating the risk of climate change for all

urban residents. It is their progress that has led some observers to describe cities as climate change "first responders," ahead of national governments.

Climate governance programs and policies are being deployed by local governments, nongovernmental organizations and private actors. They range from the level of individual buildings to neighborhoods to metropolitan areas. These experiments cover a range of issues related to climate change – and are deeply concerned with climate justice.

Urbanization is only part of the solution to climate change and climate change injustice. There remain significant obstacles to the lofty objectives embedded in the UN's Millennium Development and Sustainable Development Goals. But if environmental history is any guide, urbanization is not only our demographic destiny. It can be the redemptive force providing the context for positive change.

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