LOOMING DISASTER AND ENDLESS OPPORTUNITY: OUR WORLD'S MEGACITIES

The breathtaking growth of the world's cities threatens to become an uparalleled human and ecological catastrophe. Unless we can transform megacities into living laboratories of sustainable society.

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The numbers are familiar and they are not pretty. We will have more megacities, with more poverty, more disease, and more inequality of opportunities and life chances. Here I want to revisit these familiar scenarios through the lens of one particular looming catastrophe –climate change—and ask whether the severity itself of this catastrophe might force governments, civil society, and enterprise into innovative action. There are two critical features of this innovative action that I want to emphasize here as potentially positive remedies for the negative impacts of climate change and inequality on megacities. One is the intensive use of particular forms of scientific knowledge that allow us to return to nature processes we have today replaced with man-made chemicals. The other is that greening our cities actually has a distributive effect insofar as all households, neighborhoods and firms need to be part of the effort. Could the greening of our cities be a tool to strengthen democracy?

The evidence points to a number of worrisome trends. Cities, especially megacities, are spaces where the threats of climate change are most intense. Since 1950, the urban populations of low- and middle-income countries have increased sevenfol, coupled with a sharp increase in population and economic activities in low coastal areas. Africa, mostly a rural continent, now has two-fifths of its population in urban areas – and a larger urban population than North America. David Satterthwaite, one of the leading researchers on the subject, finds that the last 50 years have seen a sharp increase in the share of the poor in cities, who lack basic infrastructure and services, with one billion

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THE POOR ARE AT GREATEST RISK

in "slums" or informal settlements, and many of these at risk from flooding or landslides.

The largest number of megacities are in Asia, a region particularly vulnerable to flooding. By 2000, the last year for which we have something approximating measurement, Asia, Africa and Latin America had the largest share of megacities. Since then the projections suggest that the number of megacities in these regions has not declined. A second trend is also emerging. The poor will be hit hardest by climate change and its consequences — from floods to diseases. The share of urban residents in low coastal areas is extremely high, at 86%, in wealthy countries and lower in lower-middle (56%) and low-income countries (41%).

A third trend is that low-income settlements absorb more of the environmental damage than wealthy settlements. Loss of healthy life years as a result of global environmental change (including climate change) is "predicted to be 500 times greater in poor African populations than in European populations, " according to Anthony Costello of the Institute for Global Health at University College London. There are several factors at work, from regional variations in the impact and types of climate change, to differences in existing levels of heat and food stress.

Further, this trend cuts across the high-income/low-income country divide. Rachel Morello-Frosch of the School of Public Health at University of California Berkeley, calls this the "climate gap". In a 2009 study, she says data on Los Angeles, California shows that African Americans are twice as likely as other city residents to die during heat waves and families living below the poverty line are less likely to have access to air conditioning or cars to escape the heat. Five of the smoggiest cities in California have the highest concentrations of people of color

and low-income residents and are projected to have the largest increases in smog associated with climate change. Low-income and minority families spend more of their income than most Americans on food, electricity and water – as much as 25 % of total family income. These four trends point to a disturbing landscape of massive threats and sharp inequalities in the intensity of these threats for different areas and income groups.

Those are some of the negative consequences of existing trends. But what about the opportunities for change? To what extent can confronting climate change in our large cities mobilize the multiple capacities and strengths of cities and in this process produce a more democratic distribution of risks and remedies? The massive processes of urbanization under way today are inevitably at the center of the environmental future. It is through cities and vast urban agglomerations that humankind is increasingly present in the planet and through which it mediates its relation to the various stocks and flows of environmental capital. The urban hinterland, once a mostly confined geographic zone, is today a global hinterland. With the expansion of the global economy we have raised our capacity to annex growing portions of the world to support a limited number of industries and places. Major cities have become distinct socio-ecological systems with planetary reach, going well beyond urban space.

THE DISTRIBUTIVE EFFECTS OF MAKING CITIES ENVIRONMENTALLY FRIENDLY

The enormously distinctive presence that is urbanization iscontributing to changing a growing range of nature's ecologies, from the climate to species diversity and ocean purity. And it is leading to the formation of new environmental conditions — heat islands, ozone holes, desertification, and water pollution. Urbanization and industrialization have made humankind the major consumer of all significant ecosystems. There is now a set of global ecological conditions never seen before. But are these global ecological conditions the result of urban agglomeration and density or are they the result of the specific types of urban systems we have developed to handle transport, waste disposal, building, heating and cooling, food provision, and the industrial process through which we extract, grow, make, package, distribute, and dispose of all the foods, services and materials we use?

It is, doubtless, the latter –the specific urban systems we have made. One of the outstanding features when one examines a range of major cities today is their sharp differences in environmental sustainability. These differences result from diverse government policies, economic bases, cultures of daily life, and so on. European cities are generally far more engaged with environmental sustainability than US cities, and the poor megacities of the poor and rich world have a particularly big challenge.

Beyond the differences of cities are a few foundational elements that dominate our way of doing things and which are at the heart of what we need to address. One of these is the fact that the entire energy and material flux through the human economy returns in altered form as pollution and waste to the ecosphere. Much is being done in some cities to maximize the flow through –with waste recycling the most familiar case. Another is that we have replaced far too many of nature's balancing processes with man-made chemicals, thereby further disrupting nature's cycles. The most familiar cases here are promoting bio-diversity in agriculture –crop rotation is one way of achieving what chemical fertilizers and pest-killing poisons do.

When it comes to cities, addressing our environmental challenges takes on a strongly distributive character. I can illustrate this with the increasingly common requirement in cities that all roofs of new buildings carry solar panels and greenery, especially urban agriculture, or the requirement that new urban developments factor in bike paths. There is a horizontal spread of interventions. To this we can add the new types of interventions coming out of scientific research. For instance, certain bacteria that can live in cement can neutralize the CO2 emissions of buildings –extremely important since buildings account for well over half of all such emissions worldwide. Or thatcertain types of algea can be used to clean up chemically contaminated water and ground.

These examples signal that much of the work addressing the environmental challenge in large and complex cities consists in spreading a range of interventions –the larger the share of households, neighbourhoods, enterprises, buildings, that become part of these interventions the better the overall outcome for everybody, whether rich or poor. This is a crucial outcome, especially for megacities with their extreme inequalities.

Addressing our environmental challenge might turn out to be one of the most effective means to strengthen democratic and distributive dynamics. Not addressing these challenges is the most powerful way of strengthening inequality and the maldistribution of resources. ■

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