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Man-Made Cities and Natural Disasters: The Growing Threat

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Residents use an improvised raft, made of styrofoam, to cross floodwaters at Dampalit town in Malabon city, north of Manila August 11, 2012. The death toll in nearly two weeks of steady monsoon rains in the Philippine capital and nearby provinces had climbed to more than 100 people, while more than two million people were affected by the worst flooding in three years, disaster officials said (Romeo Ranoco/Courtesy Reuters).

The world is experiencing the most abrupt shift in human settlements in history. After decades of rural to urban migration, half of all humanity now lives in cities. By 2050, that figure will surge to 75 percent, with the developing world responsible for most of this increase. Mankind's unprecedented urbanization will create new economic opportunities. But it will also place extraordinary strains on national and

municipal authorities struggling to provide the poor inhabitants of these chaotic agglomerations with basic security, sustainable livelihoods, and modern infrastructure.

And when it comes to natural disasters, today's burgeoning urban centers will increasingly be on the front lines.

Statistics on urbanization are staggering. Cities in the developing world are adding five million residents per month—seven thousand each hour, or more than two per second. For perspective, this is the equivalent to adding one city the size of the United Kingdom every year. Between 2010 and 2050, experts predict, Africa's urban population will triple, while Asia's will double. The vast majority of newcomers are poor. Today, some 828 million people live in slums, including more than 60 percent of city-dwellers in sub-Saharan Africa (and 43 percent in South-Central Asia). By 2040, the global number of slum-dwellers will climb to two billion—nearly a quarter of humanity—as the world's shanty-towns, *bidonvilles*, and *favelas* add another twenty-five million per year.

From a long-term economic perspective, the shift from rural to urban living can be a boon for national wealth. As a general rule, UN Habitat explains, "The more urbanized a country, the higher the individual incomes."

But the world's rapidly growing cities are increasingly at risk of natural disasters, ranging from catastrophic fires to landslides, massive floods, and tidal waves. This is alarming, given evidence that such events are on the rise. According to the Center for Research on the Epidemiology of Disasters, "the number of people reported affected by natural disasters" rose astronomically between 1900 and 2011, from a few million early in the twentieth century to a peak of 680 million in 2000 (hovering around 300 million today). To be sure, much of this rise is attributable to evolving reporting standards and a growing global population. But alongside these changes has been a growing global awareness of and unwillingness to tolerate the extreme suffering of "natural" disasters.

Moreover, certain types of disasters seem clearly on the rise. Over the last three decades, during which observation techniques have been "fairly comprehensive and consistent," reports of major floods have climbed from an average of less than fifty to just below two hundred per year. Incidences of tropical storms have climbed from around ten to roughly fifteen, and the annual total of U.S. tornadoes and global tsunamis has risen significantly. The financial costs have risen even faster. According to Gerhard Berz, former head of Geo Risks at Munich Re, a German re-insurance corporation, "losses from natural disasters have increased eightfold in economic terms during the last four decades. The insured losses have even increased by a factor of fourteen."

Beyond the insurance industry, the global business community is increasingly cognizant of the susceptibility of rapidly growing cities to calamity. As the firm Control Risks states in its *RISKMAP 2011*, "The concentration of human, physical, and financial capital in cities renders them especially vulnerable to both immediate devastation and lingering disruption to transport, commerce, and communications in the aftermath of major disasters."

Today's pell-mell urbanization—typically "poorly planned and managed" by local authorities—increasingly occurs in peripheral zones of marginal habitation, leaving hundreds of millions of people at the mercy of natural disasters. Vulnerability is acute along coastal areas, where the strongest population

growth is occurring and where "any land remaining available for urban growth is generally risk-prone, for instance flood plains or steep slopes subject to landslides." Of the thirty-three cities predicted to have populations of eight million or more by 2015, Control Risks reports, twenty-one are located in coastal regions. Globally, some one hundred million people live less than one meter above sea level, many in cities like Dhaka, Lagos, Mumbai, New York, Rio de Janeiro, and Tokyo. Beyond the threat of storms and tsunamis, such low-lying cities are acutely vulnerable to climate-change induced sea level rise.

The confluence of rapid urbanization and natural disasters has been on display many times over the past decade. Haiti's crowded, squalid, capital, Port-au-Prince, surrounded by slopes denuded of trees, suffered repeated, catastrophic flooding even prior to the devastating 2010 earthquake that killed between 200,000 and 250,000 Haitians and caused an estimated $8 to $14 billion in damage. More recently, disastrous floods in Manila were exacerbated by the lack of trees and soil to absorb torrential rainfall.

Vulnerability of urban areas to natural disasters is hardly restricted to the developing world, of course, as the Japanese earthquake and U.S. experience with Hurricane Katrina attest. And as any Washington, DC, region resident knows, cities with one million people or more suffer from what meteorologists call the "heat island effect," so that its "annual mean air temperature… can be 1.8-5.4°F (1-3°C) warmer than its surroundings." This phenomenon tends to make storms more intense. "In Houston, Texas, for example, another two decades of urbanization might be enough to double a small thunderstorm's intensity, increasing the risk of flooding." Similar dynamics apparently played a role last month, when China suffered its most catastrophic rainstorm in four decades, a deluge that brought sixteen to eighteen inches of rain to some areas, killing thirty-seven people and causing $1.6 billion in damage. Some Chinese researchers attributed the storm's power to the effects of urbanization.

As Ben Franklin's old adage goes, "an ounce of prevention is worth a pound of cure." There are clear steps that governments can take to prepare for disasters, and to increase resilience in their aftermath. Two important steps are building local capacity to anticipate risk levels and establishing channels through which to request resources from state, provincial, or national governments. Another priority is emergency response training in vulnerable cities or neighborhoods. Finally, investing in—and publishing—threat assessments and risk modeling is critical. The United States should seek to catalyze broader global awareness of the threat that natural disasters pose to urban environments, collaborate on disaster prevention efforts around the world, and invest in its own disaster preparedness initiatives.