

The Economist explains

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Why are Chinese cities flooding?



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ON THE evening of August 7th, just as Friday rush hour began, a brief storm drenched parts of Beijing. The rainfall of three hours submerged many roads under water and paralysed traffic. Pictures of soggy commuters trudging through knee-deep water were soon posted on social media. Beijing, China's landlocked and generally dusty capital, "now has sea views," a typical mircoblogger remarked sardonically. Urban Chinese are becoming all too familiar with such episodes. The number of Chinese cities affected by floods has more than doubled since 2008, while over the same period the country's major rivers have mostly remained stable.

In 2013 more than 200 cities were swamped at some point. Why are so many Chinese cities flooded?

The short answer is that the country's urban sprawl has been expanding much faster than its drainage infrastructure could catch up. The government began to recognise the problem of flooding in the late 1990s, after a massive flood along the Yangzi river killed thousands of people. But the policymakers in Beijing regarded it largely as a rural problem. They poured money into the building of massive dams, whereas urban drainage was by and large neglected. According to Zhou Yuwen, a professor of civil engineering at the Beijing University of Technology, most drains cannot cope with the sort of rainfalls that has a 100% chance of occurring in any given year. In other words, it is all but certain they will be overwhelmed by ordinary rains—every year. To make matters worse, Chinese cities have expanded rapidly, some directly into flood plains. Rivers and lakes were reclaimed to make way for development. The amount of urban land in China has more than doubled since 1998, reaching a total of 50,000 square km by the end of last year, and almost all of it is covered with concrete and asphalt.

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All this is exacerbated by China's often impetuous approach to urban planning. When the planners in charge of Beijing designed its roads a few decades ago, for example, sunken underpasses were chosen over elevated interchanges for the reason that they seemed more appealing visually, as well as being cheaper to build. They have also, as it turns out, become a particular source of sodden misery. Beijing has 149 such underpasses in its urban districts.

With inadequate drains and pumps, even a single heavy rain can turn them into swimming pools, bringing traffic to a halt in the process.

The problem of urban flooding is not unique to China, but the country's rapid urbanisation has made the damage exponentially greater. With climate change on the horizon, many of its cities will have an especially hard time coping with the increased frequency of extreme weather events. A global study of flood losses, published in *Nature Climate Change* in 2013, ranked the southern metropolis of Guangzhou as the most vulnerable of the world's 136 major coastal cities, measured in terms of potential damage. Without forward-looking measures, by 2050 the city could be devastated to the tune of \$13.2 billion in a single year. This is all the more frustrating, or paradoxical even, because China's cities are also in desperate need of water. More than 400 of its biggest 600 cities face routine shortages.

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