

CITIES WITHOUT WATER

by Ingrid Wiegand, LEED AP

By 2050, 70 per cent of the nine billion people that will inhabit Planet Earth are predicted to live in cities – cities envisioned as sprawling metropolises with skyscraped city centers reaching into the clouds. But climate change is clouding the future of many of those futuristic wonders because there may not be enough fresh water to keep them livable.

Los Angeles had a 3-year drought – that ended this year, but will happen again. A drought had Capetown residents making do with 13 gallons per person per day -- just this February. They were saved in March by this year’s rains from having even that reduced on what their media were calling “Day Zero” – the day when even 13 gallons per resident would not be available to some four million people.



Photos of Cape Town Reservoirs

The UN World Water Development Report estimated that the world demand for fresh water would exceed the supply by 2030, even as a quarter of the world's cities are already finding themselves water-insecure to varying degrees. While the water shortages of many cities are the direct result of climate change, primarily in the form of drought – failing rainfall and snowfall that result in diminishing lakes, rivers and glaciers – the shortfall is primarily due to water use that can only be seen as profligate.

The UN's World Health Organization has set 103 liters/27 gallons per person per day (gpd) as the benchmark amount that will adequately supply each person with enough water to drink, cook, bathe, and clean his/her clothes and habitation. Before its drought, Cape Town residents were using some 84 gpd. Fresh from its escape from Day Zero, Cape Town lost no time going from lining up for 13 gallons of water to using 40 gpd. The City has managed to get water use down to 35 gpd, and will probably make it to its 31 gpd goal with technology like local water pressure controls.

But most of the rest of the world isn't close to that. Few do as badly as New York City. While the citadel isn't using the 200 gpd that it was guzzling in the early '90's, its water use is still about 115 gpd. California's cities do much better: 78 gpd for Los Angeles; 50 gpd for San Francisco. Miami, one of the water-threatened cities, does better at 35 gpd. Still, Chicago beats New York at water guzzling at 123 gpd, while most other American cities do even worse.

The rest of the world does better than the US, but most, like Beijing, Cairo, Sao Paulo and Moscow – which uses 53 gpd -- still hover around twice the amount prescribed by

WHO. But Mexico City, which is one of the cities most threatened with running out of water, is pushing it at 79 gpd.

While the amount of water on the planet doesn't change, its distribution is changing rapidly, leaving huge areas without rain and mountains without snow. While each city has its own configuration of water sources and its own way of dealing with them, Beijing's story has most of the elements of the water problems cities are facing.

Beijing was originally supplied with water from pristine springs in the wooded mountains to the north and west of the city. These were linked by channels and lakes into a water supply system created by the great Chinese engineer, mathematician and astronomer, Guo Shojing, during the reign of Kublai Khan. This was supplemented over the centuries with ground water drawn by wells from a vast system of aquifers under the North China Plain, of which Beijing occupies the Northeast corner. In the last century, as the mountains were denuded of their forests and the springs dried up, Beijing supplemented its groundwater by damming surrounding rivers and creating reservoirs. But while adding to the supply, Beijing permitted much of the water to be polluted, so that even today, some 40 per cent of the fresh water around the city is too polluted to even be used for agricultural irrigation.

Today, Beijing with its more than 21 million people, is one of the most water-challenged cities in the world. Although several dams on several rivers have been added to its supply, the city continues to draw down its ground water at a rate that significantly

exceeds the ability of the aquifers it relies on to recharge. As Beijing's summer monsoons bring less and less rain, the city's Day Zero looms – as it does for too many cities across the world.

But despite the real threats to our water supplies, most city dwellers remain under the illusion that their water will always flow from their taps – because how could it be otherwise? A study found that if the water is communal – as from a village well -- water consumption will stay close to about 4 gpd. If there's a tap in a common yard, where everybody who lives adjacent to that yard – usually several units of an extended family – has access to it, consumption per person goes up to 13 gpd. However, if water comes out of a tap anywhere inside a private home, the people in that house will average 40 gpd. It's the magic of turning OUR tap and water flowing out that seems to make our water more like a right rather than something that's shared and needs to be used carefully. Until we understand that, we who live in cities won't be able to deal with our public relationship to our water supply – until our Day Zero arrives.

#