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Book review: *The urban fix – resilient cities in the war against climate change, heat islands and overpopulation* by Doug Kelbaugh

Author(s): Jenny Goldie

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BOOK REVIEW

The urban fix – resilient cities in the war against climate change, heat islands and overpopulation
by Doug Kelbaugh
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Jenny Goldie – Sustainable Population Australia

As climate change bears down on us, some are moving to the country to attempt self-sufficiency and reduce their carbon footprint. Yet Doug Kelbaugh's *Urban Fix* sees urbanization as a solution to, not only climate change, but extreme heat and overpopulation as well.

The book's cover shows a streetscape dominated by mature trees with terraced houses built directly on to the street. This is the kind of city street that Kelbaugh regards as the ideal – side and front gardens, especially lawns, are a waste of space, suburbs are anathema. Trees, however, are good. They are part of a well-designed cityscape that can provide a solution to many problems including urban heat islands (UHIs), which are heating up cities twice as fast as their surrounding countryside.

"Global warming is upon us, with accelerating and profound changes to our civilization and our lives," (p.xi) Kelbaugh writes. "… Another mega-narrative lurking in the background is global population growth, that other hockey-stick curve of the last few centuries. It is of course connected to climate change, because total energy use tracks the number of humans" (p.xii).

Cities are the centres of civilization. They "make our societies more productive, more livable, more diverse, culturally richer and wealthier," (p.xvi) he writes. And yet the impressive benefits of urbanism are "all put at risk by the simple arithmetic

of too many people consuming too many resources too fast, and producing too much pollution and waste for the earth to handle" (p.xvi).

Kelbaugh, who is Professor of Architecture and Urban and Regional Planning at the University of Michigan, has a quarter century's involvement in sustainable cities, urban design, New Urbanism and now Lean Urbanism. Who better to advocate for urbanization as the key to mitigating climate change? This book, while vastly referenced and packed with information, is written in journalistic rather than academic style and thus accessible to a wider range of readers.

So, what does he suggest? To reduce the problem of urban heat islands Kelbaugh advocates four strategies: raising albedo through lighter-coloured roofs, pavements and walls; opening up tight street canyons to ventilating breezes and winds; reducing waste heat from tail-pipes, chimneys and air-conditioners; and providing cool micro-climates with more trees and other vegetation to cool the air, sequester carbon dioxide, and shade streets and buildings.

To reduce waste heat from tail-pipes, people are going to have to walk more, cycle more and use mass-transit more. This will require the development of new, closely packed housing near jobs and commercial centres. The built environment will be a network of small blocks with wide footpaths lined with trees and buildings, safe from crime and vehicular traffic. Gasoline-powered cars will have to be replaced by electric vehicles (EVs). Buildings will need to be less dependent on air-conditioners and central heating, and incorporate passive heating and cooling design strategies in addition to being energy-efficient.

If we are to keep within the Paris Accord, namely limit warming to no more than 2°C, then electricity-production will have to change with coal-fired coal power stations removed from the equation. There has to be a shift from fossil fuels to renewables; a distribution of micro-power plants within or on buildings (PV, wind, biomass, hydropower); hydrogen must be deployed for energy storage; smart grids built to save, store and buy-back energy, and vehicles powered with batteries and fuel cells.

Kelbaugh extols the virtues of higher densities (though many parents, who would prefer a backyard in which their children could play, might disagree). Cities are

places of economic opportunity and productivity and some studies suggest doubling density raises productivity by 6 to 28 per cent. On the other hand, cities have generated outright negative externalities, including higher levels of crime and congestion, the spread of infectious diseases and being less resilient in crises. Yet, he argues, "cities have historically reduced these negatives through greater wealth, education and infrastructure, from sanitary infrastructure, to hospitals and universities to garbage collection and policing" (p.259).

Cities have allowed humans to flourish through the benign climate of the Holocene. As that favourable climate changes, he writes, "let's hope civilization does not abandon its many hard-won fruits" (p.259). Kelbaugh emphasises that we have little time to lose. "Our species has never faced a crisis as pervasive as climate change, and with so little time to address it" (p.288). Given the six warmest years on record have all occurred since 2010, and 17 of the 18 warmest years since 2001, it is clear we must act now to mitigate climate change.

According to the Global Footprint Network (2019), presently 1.75 Earths are needed to sustainably support the consumption of resources and to absorb the waste of 7.6 billion humans. The ever-enlarging footprints of those in the fast-growing developing world are now adding to the large footprints of those of us in the developed world, seriously and irreversibly affecting the climate system. Thus, Kelbaugh argues, "extreme population is as serious as extreme heat" (p.285) and, somewhat counterintuitively, urbanization is a way to reduce it.

So how do cities help solve overpopulation? The "population paradox of cities" (p.20) largely applies to developing countries, many of which are following a similar trend toward urbanization experienced in Europe during the 19th century. The paradox consists of a reduction in the birth rate of urban populations when it might be expected that wealthier urban residents could afford to have more children than their poorer rural cousins. However, a number of factors including easier access to contraception, improved education (especially female), the higher costs and complications of raising children in the city, and the fact that children are no longer required for their labour all influence the reduction in family size.

This often-dramatic drop in the birth rate when rural dwellers move to cities, however, may be offset by their larger environmental footprints consequent

of their rising incomes. Nevertheless, it is critical that population growth is dampened in those developing countries that have become too populous for their resource base.

Kelbaugh cites Paul Hawken's book *Drawdown* which he claims, "offers the most complete menu of how not only to address and stop climate change but also to reverse it" (p.279). Significantly, if fully implemented, of the 80 solutions offered, the *urban* and *architectural* strategies can get over a third of the way to reversing climate change. Family planning and educating girls account for over a tenth. (Indeed, if Educating Girls and Family Planning were combined, they would be at the top of the list). Hawken, however, left out urban albedo, which the Intergovernmental Panel on Climate Change estimates would offset 44 gigatons of CO_2 emissions, earning 8th place in the rankings.

So, what next? Kelbaugh argues for more research to fill significant gaps in knowledge about how to cool cities. Greater cooperation is needed between planners, urban designers, architects, engineers and climatologists. A research priority will be how to deal with the potential doubling of cities' physical footprints within 15 years. For the existing urban fabric, change is difficult though treating surfaces to increase albedo is possible. For new structures, the goal should be to ensure access to the sun for solar thermal and solar electric, and provide shade, wind protection and ventilation by breezes.

All cities need a coherent climate plan, Kelbaugh argues, one that address flooding and air quality, as well as surface and air temperatures. There must be a priority on mitigation strategies that simultaneously yield adaptive benefits. Fortunately, there are powerful new tools for planning and design professionals, such as "Urban Footprint", computer software produced by Calthorpe Analytics.

Kelbaugh notes that more carbon has been emitted since 1988 when James Hansen made his famous testimony to the US Congress, than in the entire history of civilization prior to that. We have no choice but to arrest and reverse this acceleration. A sustainable economy is needed, one that is something more than the sum of its carbon-neutral parts. The goal of a sustainable economy, Kelbaugh writes, "…is to provide a peaceful prosperity, without blind growth and escalating competition, as well as to outgrow novelty and consumption for their own sake. It

strives to replace inequality with equity, attachment and greed with compassion and wisdom. It believes that …mindfulness can instil moderation and modesty; cooperation can beget community; and economic and social justice can improve – all of which mean that common cause can prevail over self-centred gain" (p.296).

References

Global Footprint Network, 2019. *Ecological Footprint*. [online] Available at: <https://www.footprintnetwork.org/our-work/ecological-footprint/> [Accessed 11 November 2019].