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Further Reading: Castells-Quintana, Krause and McDermott, 2020. "The urbanising force of global warming: the role of climate change in the spatial distribution of population", *Journal of Economic Geography* <https://doi.org/10.1093/jeg/lbaa030>

Kocornik-Mina, Michaels, McDermott and Rauch, 2020. "Flooded Cities", *American Economic Journal: Applied Economics* <https://doi.org/10.1257/app.20170066>

Contact: thomas.mcdermott@nuigalway.ie
Galway University Foundation
Lecturer in the Economics of
Climate Change and Development

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The urbanising force of global warming

The global population is urbanising rapidly. Each year, cities around the world host tens of millions of new inhabitants, particularly in low and middle income countries. While traditionally urbanisation has been associated with a process of structural change and economic development, today many poor countries are urbanising faster and at a much earlier stage of development, which suggests that the drivers of urbanisation have changed. Urbanisation and city growth are increasingly seen as an outcome of 'push' rather than 'pull' factors: people get displaced to cities as much as attracted by them. One of the push factors that has gained attention in recent years is the climate.

Newly published research from NUI Galway's Dr Tom McDermott, with colleagues in Hamburg and Barcelona, combines high-resolution data on climate and population, to establish a global non-linear effect of climate on urbanisation, and shows that deteriorating climatic conditions are associated with more urbanisation around the world.

Research Findings

While previous studies have found evidence that climate change can influence rural to urban migration, most of this existing literature has tended to study the effects for individual countries or regions. In contrast, this new research takes a global perspective, with over half a century of data for some 150 countries, enabling it to show the widespread nature of the effects, but also to uncover important heterogeneities in effects.

The analysis reveals that deteriorating climatic conditions – i.e. higher temperatures in places that are already hot, and lower rainfall in places where it is already scarce – are associated with more urbanisation, and that this finding holds for a global sample, once the non-linear effects of climate are taken into account. The results also suggests that these effects occur across the whole national urban structure, increasing urbanisation in both smaller and larger cities. At the city level, climate-driven growth seems to foster fragmentation, suggesting that as people arrive in large cities they are likely to settle on the urban fringe or in informal settlements.

Policy Implications

The findings have important policy implications, especially for evaluating future climate change, as well as for policies regarding climate and disaster resilience. The results indicate that climate change is likely to accelerate urbanisation in many locations worldwide, particularly in developing countries, as temperatures rise and rainfall is expected to become more concentrated, leading to more frequent extremes of both drought and flood.

The results also indicate that climate change should be expected to alter the speed and character of urbanisation, with potentially important implications for spatial development patterns and ultimately welfare. In particular, climate change will aggravate the current urban challenges that developing countries face (as highlighted by the UN's Sustainable Development Goals Agenda), with more people living in larger and more fragmented cities.